



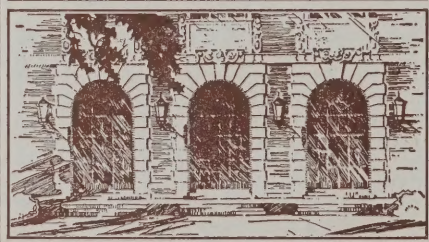


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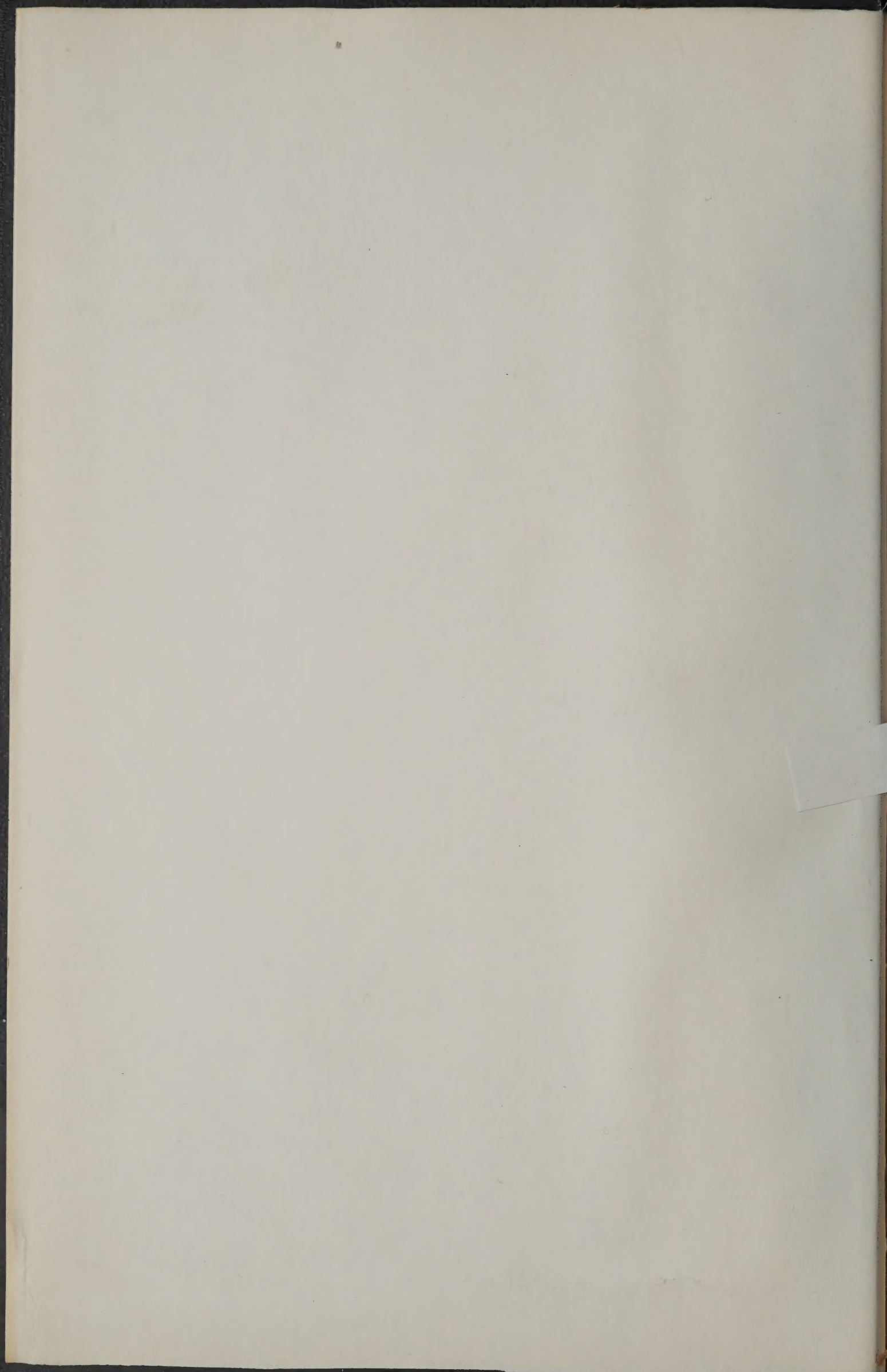














THE  
ARCHITECT

A WEEKLY  
ILLUSTRATED JOURNAL  
OF  
ART,  
CIVIL ENGINEERING,  
AND  
BUILDING.

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*"Architecture!  
That Art where most magnificent appears  
The little builder, Man."*

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THOMSON.

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# THE ARCHITECT

## A JOURNAL OF ART, CIVIL ENGINEERING, AND BUILDING

### THE WEEK.

It was decided on Monday that the Liverpool Jubilee Memorial is to take the form of a clock tower, which is to be erected near University College, and to be designed by Mr. WATERHOUSE, R.A. According to the architect's description the base, up to 5 feet 6 inches from the pavement, is to be of red granite, and all visible parts above of terra-cotta and of Ruabon red brick. The spire and the roofs of the spirelets at the angles will be covered with lead, as being more monumental than tiles, and to prevent all chances of accident to passers-by. The tower is 24 feet square and 160 feet high from the street. It is 102 feet from the street to the centre of the dials, which are 10 feet 5 inches diameter. Mr. WATERHOUSE also proposes that the dials and the band bearing the legend which would go round the tower below the cornice should be in gold mosaic. The tower will be connected with the engineering department of the college by buildings which are to be erected. Originally it was contemplated that the tower should stand alone in some part of Liverpool where it would be useful, but sufficient subscriptions were not received, and a site adjoining the college was thereupon adopted.

The following officers were elected at the annual meeting of the Dundee Institute of Architecture:—President, T. S. ROBERTSON; vice-president, CHARLES OWER; ordinary members of Council, ALEXANDER HUTCHESON and WILLIAM MACKISON; associate members of Council, ROBERT SMITH and WILLIAM STEPHENSON; honorary secretary, LESLIE OWER; honorary treasurer, J. J. HENDERSON; auditors, G. A. HARRIS and JAMES BRUCE. The retiring president, Mr. R. BLACKADDER, in addressing the meeting, said that members were increasing in numbers, but less interest was taken during the year in the competitions, although more prizes were obtainable. The treasurer's balance amounts to 44*l.* 3*s.* 2*d.*

The competition for the model village at Aintree, near Liverpool, was decided on Saturday. Out of the eighty-five designs, two by Messrs. WILLIAM SUGDEN & SON, of Leek, and Mr. FRANK MAY, of Manchester, were considered the best, and to each a prize of fifty guineas was awarded. The second prize was accordingly withheld. Messrs. WILLINK & THICKESSE obtained the third prize. Nothing appears to be said about entrusting the works to the successful architects. For the moderate sum of 126*l.*, the projector of the model village has secured suggestions for laying out his property from a large number of experts; he has also obtained the admiration of his enterprise throughout the country. After so much benefit, who will be able to say a word against the competition system? In course of time we expect to see many similar utilisations of it.

The Association of Municipal and Sanitary Engineers and Surveyors will meet at the Institution of Civil Engineers on Thursday, Friday, and Saturday in next week. The following papers will be read:—"Back Streets, Lanes, and Alleys," H. U. MCKIE, Carlisle; "Average Meter System," G. R. STRACHAN, Chelsea; "Ten Years' Experience of the

Shone System," Lieut.-Col. JONES, V.C., Wrexham; "Electric Fire Alarms," T. DE C. MEADE, Hornsey; "Water Supply," W. SANTO CRIMP, Wimbledon; "The Purification of Sewage by Electricity, Notes and Experiments," W. WEBSTER, F.C.S. There will be visits to the Houses of Parliament in order to see the new drainage works, Messrs. JENNINGS's sanitary works at Lambeth, the Lucigen and Oxygen Works, Westminster, the Greenwich ferry, and the outfall works at Barking.

THE Bill introduced by Mr. WHITMORE, Sir A. BORTHWICK, and other members, in order to restrict the height of buildings in the Metropolis is evidently inspired by the recent attempt to surpass the highest houses in Knightsbridge. According to the first clause, it is proposed that no building except a church or chapel shall be erected in any street, thoroughfare, or place, of less width than 60 feet, which shall exceed 60 feet in height, and no building except a church or chapel shall be erected in any street, thoroughfare, or place of greater width than 60 feet, which shall exceed in height the width of the said street, thoroughfare, or place, without the consent in writing of the Secretary of State, before the election of the London County Council, and after the election of the London County Council without the consent in writing of the said council, nor shall the height of any building so erected be at an time subsequently increased so as to exceed such width without such consent. According to the second clause, any person failing to inform the district surveyor, or other officer of the Metropolitan Board of Works, or of the London County Council, appointed to carry out the Metropolitan Buildings Acts, of his intention to erect any building exceeding in height 60 feet shall be liable to the penalties contained in 25 and 26 Vic., cap. 102, sec. 85, to be recovered by summary proceeding. It is to be the duty of the district surveyor, or such other officer of the Metropolitan Board of Works, or of the London County Council, to inform the Secretary of State of any building intended to be erected contravening the provisions of this Act. The Act is to apply to the Metropolis as defined by the Metropolis Management Act, 1855.

AN important decision in regard to the responsibility of valuers has been given by Mr. Justice CHITTY. In 1883 an application was made to solicitors in Nottingham for a loan of 2,000*l.* They instructed a firm of auctioneers and valuers to examine the premises offered as security, and received a report in which the valuation was put down at 3,000*l.* On the faith of that advice a sum of 2,045*l.* was lent. After a time, as the borrower was in arrears with his interest, the property was put up for auction. The highest bid was 680*l.* Afterwards the property was valued by two experts. One said it was worth 1,200*l.*, and the other 1,100*l.* The Judge thought there was no reasonable cause for giving the value as 3,000*l.*, and the statement seemed to be reckless. There was no ground for supposing that the defendants were in any way gainers by giving so high a valuation, but they were held by his lordship as liable for negligence. Judgment was, therefore, given for the plaintiffs, with an order for an inquiry into the damages sustained through the negligence and misrepresentation of the defendants.



## ART AND HISTORY.\*

IT might be supposed from the majority of books which pass for histories in England, that art—taking the word in its widest sense—was of no importance in life, and can be passed over as if it were of no more importance than the games of children. Instead of looking at all things impartially from high Olympus, the Muse of History seems to be no more than a waiting woman in a palace or a council chamber, and is indifferent to all who are not grandees or their dependants. Battles, and the events which preceded or followed them, in which the grandees held a monopoly of the honours, seem to give most delight to CLIO; next in importance are the intrigues of statesmen; but the influence of plebeian artists and writers is ignored as steadily as if it had been exercised in a different planet. In how many of the English histories will the name of SHAKESPEARE or MILTON be found? As regards art, its neglect must be ascribed to the ignorance of the historians about that subject. In no other way can we explain the omission of any reference to the Mediæval architecture of England in LINGARD's voluminous history, although it bore a close relation to the doctrines which his work was intended to support. When the absurdity of ignoring the things which had most concern for people was exposed, MACAULAY did announce his intention to depart from the old track. He promised "to trace the progress of useful and ornamental arts," and was not to neglect the revolutions of furniture. But he was soon tempted to return, or he may have found the task was too burdensome. Not much can be gained when one discovers that what is meant by ecclesiastical architecture is an inventory that seems like an extract out of an auctioneer's catalogue, viz.:—"The fair chapels of New College and Saint George, the nave of Winchester, the choir of York, the spire of Salisbury, and the majestic towers of Lincoln." When a more ambitious effort is made by one of our historians to suggest the relation between art and a particular period, it is rarely successful. There is Mr. LECKY, for example. He attends the private views of exhibitions, and sits at Academy banquets; but in spite of so many sacrifices, his chapter on English art in the eighteenth century would not do credit to a schoolboy.

There are some things in which the French beat us, and the appreciation of art by writers is one of them. We need no stronger evidence of the fact than the four volumes on ancient history by M. LOUIS MÉNARD. They are to be classed among the low-priced books, and are closely printed without any luxury of type or paper, being intended to be obtainable by students of a humble class. But what must strike everybody at the first glance is the vast number of the illustrations, especially in the parts relating to Greece, Assyria, and Egypt. Being reproductions from expensive engravings, they have an educational value on account of their accuracy that could not be attained by ordinary woodcuts. They are not introduced merely as embellishments of the volumes, but as evidence to throw light on the character of ancient peoples. M. MÉNARD does not appear as the historian of art, nor does he, in retaliation for what was done heretofore, sacrifice politics to it. Art is with him only an instrument which can be made to give help in revealing the past when other aids are wanting, or which can be used to supplement those aids. He maintains that works of architecture, sculpture, and of the domestic arts are the mute and unimpugnable witnesses of the manners and customs of a nation. Criticism may doubt the apocryphal anecdotes which imparted so much picturesque interest to the old histories; but a compensation is found in the instruction which is received through the eyes, and which is the most attractive of all. The comparison of monuments thus leads not only to the history of art, but to the history of civilisation.

The English reader must, however, be warned that the volumes will not be considered as orthodox by those who believe in a revealed religion. Like the soul in the "Palace of Art," M. MÉNARD sits "holding no form of

creed but contemplating all." Nor will his theories satisfy many who are outside the pale of Christianity. M. MÉNARD does not even agree with the doctrine of evolution which now finds so many supporters. He holds that events are neither the effects of chance nor of a necessary evolution, but are the moral consequences of a great law of equilibrium and of expiation which is the Nemesis of history.

M. MÉNARD begins with the history of Egypt. He shows how no monument belonging to the First Dynasty is to be found, and the most ancient architectural work is, therefore, the pyramid in stages at Sakkara, which is supposed to be the tomb of a king of the Second Dynasty. According to M. DE RONGÉ, the earliest work which can be classed amongst sculpture is a relief at Ouady-Magara, representing King SNEWROI, who is represented standing over an enemy whose hair he holds, an attitude which was often repeated in the portraits of subsequent kings. M. MÉNARD quotes what is said by his countryman, MARIETTE BEY, about the Pyramids being a striking recognition of the doctrine of the immortality of the soul. They could not be easily overturned, and while they remained they were evidence of the truth of the dogmas of the priests. But M. MÉNARD is too honest a Republican to see much virtue in such proofs. If the Pyramids were smaller, he says they would be more convincing in that sense, for if a king's soul is immortal, the plebeian's soul should possess a similar quality, and there is no morality in making tombs express the inequality among men in this world. Besides, the dogma of a future life is consoling, because it inspires the hope that an unjust inequality will be redressed. M. MÉNARD does not bestow much pity upon the Egyptians, who in death as in life recognised their inferiority to their rulers. He also shows himself to be a Parisian when he tells us that the Greeks supposed the Sphinx in the desert was a representation of a woman, because "la femme est l'énigme éternelle."

M. MÉNARD considers that a study of Egyptian remains is sufficient to convince people of the unsoundness of the theory which makes art have its origin in religion. Architecture, it is said, appeared first in the temple: the manifestation of religious thought, and all other forms of art, were derived from the temple or associated with it. Now he maintains that in the earliest Egyptian paintings the art is entirely mundane and realistic, the subjects are taken from agriculture, field sports and common industries. There is no religious symbol. Sculpture had evidently an existence separate from the temples, since the statues which were most ancient—the wooden figure of the overseer RAEM KE in the Boulak Museum being one—are portraits. This will suggest the spirit in which M. MÉNARD studies art, and it will have advantage in compelling readers who believe in the established theories about the history of art to think over the grounds of their faith. In some books on architecture the Doric order is traced to the columns in the grottoes at Beni Hassan, a theory which may be credited to CHAMPOLLION. WILKINSON, who did not trust to manipulated engravings, after seeing the place did agree that the prototype of the Greek column was to be found there. M. RAMÉE suggests that the columns at Beni Hassan were probably wrought by Greek prisoners. M. MÉNARD denies any relationship between the two columns, since there is no swelling in the shaft, no echinus, no triglyphs, no metopes to be seen at Beni Hassan. If the Greek architects desired to draw inspiration from Egypt, something more eligible than the posts in the grottoes could be found. The architecture, painting, and sculpture of the Egyptians are described by M. MÉNARD, in order to suggest some of the characteristics of the people and their institutions. He maintains that Egyptian art should never be compared with Grecian art, which owes its existence to a very different sort of inspiration. According to our author, it is only in a republican society that aspiration towards an ideal, and a sense of the dignity of man, are possible. In Egypt art was used as a means to consecrate the prowess of the monarch or the acts of devotion to a divinity. The religious subjects are scenes of ritual ceremony. There was no search after ideal beauty; but grandeur was obtained in architecture by simplicity of the lines, and in sculpture and painting by simplicity of forms. The representations of domestic life which the Egyptian

\* (1) *Histoire des anciens Peuples de l'Orient*; (2) *Histoire des Israélites d'après l'Exégèse Biblique*; (3) *Histoire des Grecs*. Par Louis Ménard, Docteur ès Lettres. Avec de nombreuses illustrations d'après les monuments. Paris: Librairie Ch. Delagrave.



painters have produced for us are more valuable as historical evidence than Greek works, which are of higher merit as works of art. There is no difficulty in realising the everyday life of an Egyptian gentleman, but we know the Greeks only through literature. It is hard to say how far they went in their idealisation. When we learn that EURIPIDES was condemned because he attempted to hold the mirror up to nature by making the characters in his tragedies bear some resemblance to the people who lived at the time, it is evident that the daily round of life was not supposed to be within the province of art.

The Assyrians, who come next in M. MÉNARD's book, are described by him as a stern and bellicose race. No people could have a firmer faith in the virtue of strong battalions, or show more cruelty when they were the conquerors. An inscription records how enemies would be treated by the monarch. "I constructed a wall," says ASSOURNASIR-PAL, "before the great gates of the city. I flayed the chiefs, and covered part of the wall with their skin; some were burnt within the masonry, others were crucified or impaled. Many more were flayed in my presence, and their skins placed on the stones. The heads were heaped into the form of a crown, and their bodies into the form of garlands." Another mighty hunter of men glories in the number of hands he cut off, the eyes he plucked out, and the cities he demolished by fire. Not one of them says, remarks M. MÉNARD, that he is a ferocious beast; on the contrary, he takes himself for a great man, since all the world is in fear of him.

The art corresponds with the character of the people. The value of muscle was recognised, and the king was represented as the most muscular of all. HERCULES, assuming him to be of the physique seen in the Greek statues, might hesitate before he encountered one of those splendid fellows who have not an ounce of superfluous flesh, and one of whom can singly attack a fortress, and allow a lion to approach his chariot before he condescends to kill the beast. The attendants on royalty are also men of might, and everywhere there is recognition that the safety of the empire lay in the vigour of the inhabitants. War inspires most of the representations; and while we see very little of the lives of the ordinary population, it is almost possible to trace all the details of the military uniforms. But if their neighbours did not inspire the Assyrians with fear, they were evidently in dread of invisible beings. Magic and astrology flourished among them, and their operations in war were supposed to be for the exaltation of the gods.

M. MÉNARD in the same volume also treats of Phœnicians, Indians, Medes, Israelites, and Persians, in order to complete the history of that part of Asia which was most related to Europe.

New theories of language and mythology have increased the interest in the Asian mystery, but people to whom art is supreme will prefer to read M. MÉNARD's volumes on Greece. His method of treatment will be apparent from his first sentence, where he lays down the maxim that to comprehend the character of Greek civilisation, a knowledge of works of art is at least as important as a knowledge of works of literature.

That M. MÉNARD is an enthusiastic Hellenist will be evident from the following lines out of the poem which he prefixes to his history:—

Dieux heureux, qu'adorait la jeunesse du monde  
Que blasphème aujourd'hui la vieille humanité,  
Laissez-moi me baigner dans le source féconde  
Où la divine Hellas trouva la vérité.

Laissez-nous boire encor, nous, vos derniers fidèles,  
Dans l'urne du symbole où s'abreuvaient les forts.  
Vos temples sont détruits, mais, ô Lois éternelles,  
Dans l'Olympe idéal renaissent les Dieux morts.

But all these aspirations after a past which cannot be recalled does not interfere with the author's pursuit of truth. He begins with a description of the geography of Greece, tells us of the latest speculations about the origin of the inhabitants, analyses their religion and legends, speculates upon their manners and institutions, explains the advantages and defects of the Government, and traces the eventful history down to the establishment of the Roman empire.

It is difficult for a Parisian not to believe in the omnipotence of cities. It is the business of the country to

uphold them. As AUBER the composer said once, "La campagne c'est bon pour les petits pois." The Greeks were a people of that kind, and their art could never have so nearly approached perfection if they were afflicted with any weakness for bucolic pursuits. Dwelling in cities there might be constant danger of abuses, but there could be no tyranny resembling what was to be found in Asia. The Greek city, says M. MÉNARD, was based upon the double principle of direct legislation and gratuitous government, and a barbarian in the eyes of the inhabitants was not necessarily a vulgar or uncultured man, but one who was deprived of those advantages.

We have said that M. MÉNARD will not recognise any indebtedness to Egypt for the Doric column. He insists that Greek architecture was racy of the soil of Greece. The temples, he says, were imitations of the timber huts which are still to be seen in Lycia and other parts of Asia Minor. He will not believe in the origin with an individual of any feature, and sets aside the venerable tradition concerning the origin of the Corinthian capital. He has faith in the inspiration of crowds. Just as religious fables and epic legends come from them, in the same way architecture and decoration were their collective and anonymous work. The Corinthian capital, according to M. MÉNARD, was no more than a copy of another form of capital, when seen surrounded by leaves and flowers on the occasion of a fête. The Ionic, on the other hand, was derived from the rolls of drapery on each side of a cippus or stele. The friezes represented the skulls of the sacrificial animals which were hung outside the temple, and united by garlands of flowers. Polychromy owed its origin to a desire to give the colours as well as the forms of the festal decorations.

Sculpture in terra-cotta, according to M. MÉNARD, appeared first in Greece, and the material was used for acroteria, antefixæ, and metopes. He does not credit the legendary origin of the art with DÆDALUS. As the name signifies industrious, the mythic sculptor or wood-carver was only a sort of personification of the first schools, although some of the families of sculptors in Attica—SOCRATES being a member of one of them—claimed DÆDALUS for an ancestor. There is much muscular development of an Assyrian sort in the early sculpture of Greece; but, according to our author, it is difficult to believe in any communication with Assyria.

It was under PERICLES that "le problème social résolu par l'art." M. MÉNARD sees in him a type of the true demagogue—that is, a guide of the people, who was everywhere and in everything a true citizen; and hence, through his counsel, Athens merited to be called the Greece of Greece. But it is not generally known that the great works which were undertaken at his suggestion were intended in a great measure as a means to find employment for many people. They were utilised in preparing materials for the buildings, in erecting temples and theatres. Who can count the number who were engaged in works where so many materials were used? "All the decorative arts united with architecture," says M. MÉNARD, "to express the political and religious thoughts of the people, who were happy by labour and a recognition of what was true and just, and especially by the spectacle of so much beauty. PERICLES had found in art—which is the highest form of labour—a solution for that problem of how to deal with the misery which disturbs the equilibrium of modern Europe." It is in accordance with this view that M. MÉNARD should see in the procession around the Parthenon a representation of the people celebrating the most august of their religious festivals.

With all our admiration for Athens, it is impossible not to recognise that seeds of decay were in the city. No human institution is safe against corruption. Athens would engage in a fratricidal war, and from that time its greatness began to wane. The city was devastated by a plague; there were revolts among the inhabitants; the artificers could find no employment as the treasure was expended on the campaigns. The Sicilian defeat was only one event in a series of disasters.

But art contrived to survive. The moderns, as M. MÉNARD remarks, imagine that they display purity of taste by restricting their admiration to the Parthenon sculptures. But the Greeks were more catholic. They



considered no offence was committed against the *Zeus* of Olympia, or the *Athené* of the Parthenon, when one praised the *Juno* of POLYCLETUS and the *Venus* of Cnidos. It was subsequent to the age of PERICLES that types of figures were recognised as a sort of law, and sculptors felt bound to pay tribute to the past by reproducing the form of their predecessors. Hence, says M. MÉNARD, every Greek statue is a translation by an individual of a thought that was collective, and the divine types created by the sculptors are the roots of that language which speaks to us through our eyes.

In comparing Greek and modern sculpture M. MÉNARD considers that the defects of the latter arise in a great measure from trying to be over expressive. But it is in the application of sculpture to architecture that he sees the most marked difference. By avoiding the use of colour, by placing statues along a wall or in niches of the same colour, and by fixing figures at heights where they cannot be discovered without the aid of a telescope, it becomes plain that sculpture is no longer a necessity to intellectual life as it was among the ancients.

It might be supposed that Greek art was not likely to survive loss of liberty. One class of works became impossible, or fell out of fashion. Gods and goddesses were henceforth more akin to mortals. The portrait statues and busts, on the other hand, appear to be efforts to confer a more than manlike character on the subjects. Then the Greek schools of Asia Minor produced a glorious harvest. One of the renowned works is the *Venus of Melos*. M. MÉNARD gives a sketch of the statue as it appeared when brought to Paris before the inscription was removed, which recorded that it was the work of a sculptor of Antioch. The authorities of the Louvre were afraid that as a name counts for much, the Parisians would think little of a statue which could not be ascribed to some great Athenian. The *Laocoon* is by many supposed to come from another of the distant schools, that is, Rhodes. When the Romans in turn became masters of the world, they were able to have statues produced by Greek sculptors, but the position of the artist was no longer the same,

The bigots of the iron time  
Had called his harmless art a crime.

At Rome, says M. MÉNARD, SENECA asked if painting and sculpture could be classed with the liberal arts. PLINY and CICERO were no less disdainful. Yet, in spite of so unfavourable an atmosphere, sculpture died slowly.

We have said enough to suggest how unlike most histories are the works of M. MÉNARD. It is courageous on his part to be so frank in recognising the power of art and in insisting on its appreciation as one of the duties of a free State. It would be well if ancient history could in this country be taught from such valuable books, but it would be necessary to eliminate parts which do not correspond with doctrines that are accepted in a great part of the globe. Admiration of pagan art does not make it necessary that the world should again be suckled in a creed forlorn; or, to transpose the words of M. MÉNARD, "Il n'est pas nécessaire de proscrire le juste pour exalter le beau."

#### THE GLOUCESTER BATHS AGAIN.

AT the meeting of the Gloucester Town Council, on June 26, a report from the Baths Committee was read, in which the acceptance of the tender of Messrs. W. Storrs, Sons & Co., Limited, of Stalybridge, was recommended, it being understood that the contract price, including finishing and fitting up of the baths, was not to exceed 7,500*l*.

Mr. Platt, in moving the adoption of the report, explained how the increase, beyond the stipulated sum of 6,000*l*., had arisen owing to the alterations proposed by the committee. The lowest of the first general estimates was 8,499*l*., and additions brought it up to 9,190*l*. He would strongly recommend the Council to go in for the whole thing, and said he would rather spend 9,000*l*. than the 7,500*l*. on the baths. It was no use blinking the fact that the report of the Baths Committee was a compromise. They had cut down the plans to a plain bare building, which would come to something like 7,500*l*. He hoped the Council would consider the matter fully, and not have a block of buildings of which they would be ashamed.

Mr. Peake proposed, as an amendment, that the report should not be adopted, nor any tender accepted at present. Mr. Trew, the architect, wrote last February to say that he

would abide by the conditions, one of which was that the total cost was not to exceed 6,000*l*. Now they were asked to approve of the erection of a mutilated set of plans at a cost exceeding the 6,000*l*. by one-fourth. He could not help thinking that the committee certainly misunderstood their instructions, and that it would have been greater wisdom and judgment if, when they found this amount was so very much exceeded, they had taken the Council into their confidence.

Mr. Mousell inquired whether Messrs. Giles & Gough's plans were not considered the best. He understood that their plans were recommended by the expert as being the best, but were refused by him on the ground of cost. He also understood that Messrs. Giles & Gough, who had designed the Second County Asylum, were prepared to find a man to build baths on their plans at their estimate of 6,000*l*. Might he ask why these plans were not adopted?

Mr. Powell said that if Mr. Trew's plans had been carried out as they were they would have been good enough, and could have been built for 6,000*l*. But fortunately, or unfortunately, for the citizens, they got a lot of practical men on the committee. First they got an engineer, who said the boilers must be larger, and then a builder, who said they must have thicker walls, and thus the buildings were enlarged and the cost increased, so that they could not get the plans carried out under 9,000*l*.

Alderman King said Mr. Powell had been kind enough to refer to practical men, but he thought Mr. Powell would understand that he was deficient in that respect, for when the plans were on view that gentleman refused the elevation of one set of drawings, and then went and chose the perspective. When this was pointed out to him Mr. Powell remarked, "I know as much about drawings as a penny-piece."

Mr. Powell admitted that he said so.

Alderman King said he should like to see baths erected in a more efficient manner than was now proposed. He had carefully gone into the details. The Council had given the committee power to go to a limit of 6,000*l*. for baths, and their total cost, including the price of the site (1,550*l*.) and the architect's commission (350*l*.), was to be 7,900*l*. Taking the lowest original tender, which was 8,499*l*., and adding 663*l*. to it for the alternatives, it gave 9,162*l*. Then must be added 1,550*l*. for cost of site; 686*l*. for architect's and surveyor's commission, 400*l*. for works necessary, 120*l*. for clerk of the works, 500*l*. for contingencies at 5 per cent., and 100*l*. for incidentals. These items gave a total of 12,518*l*., and deducting from this the 7,900*l*. for which the committee had authority, the excess appeared at 4,618*l*. Under these circumstances, he did not think the committee should have recommended the adoption of any tender. He still hoped that Gloucester would have baths, and that the present committee, or some new committee, would place the matter in an acceptable form.

The Mayor said the last time he attended the committee he understood that the plans could be carried out for 6,000*l*.

Mr. Seekings said that in Mr. Trew's plans as presented the baths were in such a position that one man could look after both of them. They wanted to provide baths for all classes, and that was the reason why they had not adopted any one plan in its entirety. He was sorry to be in a position to advocate an expenditure which he had hoped would not be exceeded. The committee were anxious to get a good set of plans, and he believed a smaller building would bring failure. He named several towns where they were enlarging their baths. If the Council decided that the limit of 6,000*l*. was to be kept within, they decided that the dimensions of the buildings were to be greatly reduced, and he hoped they would hesitate before they adopted so fatal a policy.

Mr. Arkell suggested that the whole question be referred to a committee of the entire Council. Then Mr. Mousell's suggestion as to another plan and any other plan could be considered.

Alderman Mott said he was of opinion that the Council began in error with regard to the baths question. Before fixing the amount of cost they ought to have first decided what sort of baths they wanted, and then have asked for plans. He thought the question of cost had nothing to do with it. The amount of 6,000*l*. was simply founded upon the statement of some one that baths had been built for that amount in the country. He was not prepared to vote for the reduced plan. Certain points had been clearly brought out which showed that the Council could not get what they wanted for 6,000*l*. If the Baths Committee would be good enough to explain in detail their reasons for altering Mr. Trew's original plan and for submitting an altered plan and estimate of about 9,000*l*., and what would be lost in the cutting down of the plans, then perhaps the Council would be in a better position to come to a decision on the matter.

Mr. Peake said he should have great pleasure in accepting Mr. Arkell's suggestion. His amendment would now be, "That the report of the Baths Committee be not adopted, and that no tender be at present accepted, but the whole question be referred to a committee of the whole Council."



The Mayor said he was a member of the committee, and the last time he attended Mr. Trew was present with his amended plans, and he put the question distinctly to Mr. Trew, "Can these plans be carried out for 6,000%?" And Mr. Trew distinctly said they could be carried out for that amount. Mr. Platt said he did not agree with that, and that they would cost 500% or 600% more. Mr. King said, "No, 300%." It was Mr. Trew who had made the mistake (a Voice: "No"). He (the Mayor) said it was Mr. Trew, and not the committee. Any practical man who looked at the plans must have seen that they would cost at least 8,000% to carry out. That was why he proposed in Council that sanction should be obtained to borrow 8,500%. Mr. Trew ought to have told them that the cost would exceed 6,000%. As a member of the committee he declined to take any blame whatever.

Mr. Estcourt thought that when these modifications and suggestions were made in his plans, Mr. Trew ought to have stated to the committee that, if they were going to make all these alterations, they would much increase the expense beyond the 6,000%.

Mr. Platt, in reply, said Mr. Trew was not responsible for the additions. It must be borne in mind that the cost could not be told until the quantities were taken out. Mr. Mousell had brought up about Messrs. Giles & Gough's plans. The committee did not go into that, as the expert said their plans were too large, and would cost more than the sum prescribed. He was quite agreeable to the question being referred to a committee of the whole Council. The committee had taken too much on themselves, and ought to have left it more to Mr. Trew and the surveyor. The reason the committee did not place the original tenders before the Council was that they thought it would save time if they obtained revised tenders before doing this. He was willing to withdraw his resolution in favour of the amendment.

Mr. Peake's amendment as altered then became the substantive motion, and was carried unanimously.

The Mayor said he would take an early opportunity of calling the committee of the whole Council together.

#### THE IMPERIAL INSTITUTE.

ON Monday a meeting of the organising committee of the Imperial Institute was held at Marlborough House, being the first meeting since the grant of the charter of incorporation to the Imperial Institute. By the terms of the charter the organising committee is appointed the temporary governing body of the Institute for a period not exceeding three years from the date of the charter (May 12, 1888).

The previous action of the organising committee and of the various sub-committees having been approved, the Earl of Rosebery, Lord Herschell, and Sir John Rose were appointed trustees for the endowment fund, the minimum value of which is fixed by the charter at 140,000%.

His Royal Highness the President then nominated Lord Herschell and Sir John Rose respectively as chairman and vice-chairman of the organising committee, and various special committees were appointed.

The Governor of the Bank of England having, with the approval of His Royal Highness the President, nominated Messrs. Lovelock, H. W. S. Whiffin, and Dickinson, chartered accountants, of Coleman Street, City, auditors of the Imperial Institute, they were formally appointed to the office.

The organising secretary and, in his absence, the assistant secretary were designated the proper officers to sign or counter-sign documents on behalf of the corporation.

The organising secretary submitted a statement of progress since the date of the last meeting, by which it appeared that the actual funds now available, exclusive of subscriptions from the Indian Empire and temporarily invested there, amounted to 310,000%. The steps taken in furtherance of the establishment of the department of commercial intelligence and the outlines of a proposed scheme for a school of modern Oriental languages were described and approved.

The minutes of the meetings of the various sub-committees held since January 27 having been read and action thereon authorised, the lease for the conveyance of land from the Royal Commissioners for the Exhibition of 1851 and other documents in connection therewith were duly approved and executed.

The foundations for the main buildings were reported as having been completed in May last at a cost of 6,000%.

On the recommendation of the building sub-committee, the tender of Messrs. J. Mowlem & Co. for the making of the new road, to be known as the "Imperial Institute Road," was accepted at the sum of 5,825%.

The same firm's tender for the main buildings, exclusive of the central and eastern and western towers, was accepted from a list of fifteen competing contractors, the amount of the tender being 142,800%.

The organising committee, on the motion of Lord Herschell,

unanimously passed a vote of thanks to His Royal Highness the President for the zeal and energy displayed by him in the work of the Institute.

#### THE APPLIED ART SECTION OF THE SOCIETY OF ARTS.

THE report of the Society of Arts, which was read at the general meeting, has the following reference to the work of the section of applied art:—

The subjects dealt with during the present session in the section of applied art range over a varied field, and at the several meetings, bronze monuments, Persian textiles, book-binding, architecture, and colour in decoration were treated of, and the relations of craftsman and manufacturer were discussed. At the first meeting on January 31, an instructive paper was read by Mr. J. Starkie Gardner on the "Monumental Uses of Bronze," which may be considered as a companion to his paper last session on "Wrought Ironwork." The author, by means of the lantern, brought before his audience representations of nearly all the historical bronze monuments in England, as well as some of the chief specimens abroad. At the second meeting a paper was read by Mr. H. B. Wheatley, entitled "Principles of Design as applied to Bookbinding." In connection with this meeting, an exhibition of examples of historical and modern bookbindings was arranged in the library, which remained open for ten days, and was visited by a considerable number of connoisseurs and practical bookbinders. On March 20 Mr. William Simpson asked the question, "What Style of Architecture should we follow?" in a paper which originated a lively discussion among the architects present at the meeting. On April 24 Mr. Lewis F. Day urged the inutility of the middleman in art, in an interesting paper on "Craftsman and Manufacturer." Mr. J. D. Crace read a valuable paper on "The Decorative Use of Colour," on May 6, in which he pointed out the need of considering colour as a means of laying stress on the main constructive features of a building. The work of the section was brought to a close on May 29 by a paper on "Persian Fabrics," by Mr. Cecil Smith, which was fully illustrated by a series of fine specimens of various textiles, brought from Persia by Mr. Smith.

#### TESSERÆ.

##### Religion and Art.

W. DYCE, R.A.

OF the only three great systems of art which have arisen, two undoubtedly derived their character from religion. Perhaps the third, in some respects, did so too; but this is less certain. These three systems are the Egyptian, the Pagan Greek, and the Christian, the first more or less including in it the arts of Oriental antiquity, the second comprehending the whole of ancient Classical art, and the third the art of more modern times, so far as it has been exclusively Christian. The Egyptian art was essentially symbolical in its purpose. Although it employed for that purpose representations of a great variety of natural objects, yet exactness and truth of imitation were only carried far enough to indicate the reality, and that with a view to express ideas of which the objects were the representatives. The figures in Egyptian paintings, as an acute writer, M. Raoul-Rochette, has observed, were ideographic signs rather than figures to be considered as representing the objects of which they were the resemblances. And hence Egyptian art as a whole is excluded from the domain of the fine arts properly so-called. The Greek system, on the other hand, was strictly imitative, and in such sort that it carried the exact representation of individual objects to the highest degree of perfection of which they were susceptible; and thus what we term the ideal in Greek art was nothing more than the reality itself under its most embellished form. The aim of this kind of art being to render, with as near an approach to perfection as was possible, the forms of animate nature, it is obvious that physical beauty must have been, as indeed it was, an element so essential that every particular was subordinate to it, whether in the choice of subjects or in the manner of their execution. All was intended to elevate and deify nature; everything, therefore, that could suggest thoughts of imperfection, meanness, or feebleness, unless in the way of caricature, was carefully excluded; while the positive or negative qualities that tend to inspire us with ideas of resistless physical power, unchanging perfection, beauty, or dignity were as carefully had regard to. And although the art of the Greeks was not altogether devoid of moral expression, yet in general they seem to have admitted the operation and effects of the passions as an element in art only so far as was consistent and compatible with the physical perfection which, under the guidance of their religious system, the arts of the Greeks were in the main intended to develop. The third great system of art, namely, the Christian, so far agrees with the Classical that it



takes nature for its guide and its model; but it exercises itself on types altogether different, and has for its drift to interest the moral sentiments rather than to charm or flatter the senses. As in the Greek art certain types of human perfection were invented and worshipped, so also in Christian art there arose an imitative system in which were embodied under peculiar types the faith, sentiments, and aspirations of our divine religion; but there was this grand difference between the two, that whereas in the one the types were all more or less of a kind to exalt and glorify human nature, in the other they were based more or less on the griefs, the feebleness, the imperfections of humanity. In few words, Christianity effected in the domain of art a revolution precisely analogous to that which it brought about in the moral and social world; it introduced a new standard of perfection in art, made that standard spiritual rather than physical, and taught artists to aspire after a kind of excellence which it is no figure of speech to say would have been looked upon by the Greeks as foolishness. What, for example, could the Athenians of the time of Phidias have thought of the emaciated, haggard, mean, and sorrowful pictures of saints drawn by the best artists of the Christian school? Must they not have felt that their idol, human nature, was outraged and brought into contempt by such representations? Must they not have hated them as mortifying to their pride, or despised them as unworthy of their regard? Yet such is the positive, marked, and antagonistic difference between Classical and Christian art. The one has its Jove, its Hercules, its Mars, its Venus, its Graces—the representatives of majesty, physical power, warlike courage, love, and kindness; the other its Christ, its apostles and doctors, its army of martyrs, its virgin mother, its graces, its virtues. But though its Christ be majestic, he is in the form of a serpent; though the power of its apostles was resistless, yet “the weapons of their warfare were not carnal;” though its army of martyrs be courageous, their courage lay in endurance; though its virgin mother be beautiful and pure, yet “a sword pierced through her heart;” though some of its graces and virtues were esteemed among the Greeks, yet, if we take them as a company, they are in reality the complex type of self-abnegation. In brief, through the whole system of Christian art there is somewhat of a forbidding, mortified, and humbled exterior, derived from the character of the religion in which it originates, by which it is distinguished from the attractive and (not to use the word in its bad sense) the sensual qualities of the Classical school.

#### The Frieze of the Parthenon.

T. DAVIDSON.

Pericles's ulterior purpose in the whole matter (of the national festival) was to bring about a confederation of all the Greek states under the hegemony of Athens; and second, that inasmuch as most of the Ionic states were already under her leadership, and the Aiolic states, at least, not unfavourable to her, this purpose mainly resolved itself into a scheme for inducing the Doric states of Peloponnesus to enter the confederation. We should, therefore, naturally expect that one of the processions would be mainly Ionic, the other mainly Doric, and that the two would be clearly distinguished, the one as Ionic or Athenian, the other as Doric or Spartan. Instead of Ionic and Doric, indeed, we may write Athenian and Spartan, for Pericles meant nothing less than to see Sparta placed under the hegemony of Athens. Let us next, as a second preliminary to our examination of the frieze, try to make clear to ourselves the problems which the artist, desiring to represent the subject supposed, would have to solve. First, he would have to represent two processions, and show that their purpose was a common sacrifice; second, he would have to distinguish these processions as respectively Doric and Ionic; third, he would have to show that the sacrifice had reference to a multiplicity of gods; fourth, he would have to show that the aim of the sacrifice was to bring about reconciliation and union where there had previously been alienation and division; fifth, he would have to show that the effect of the union was the acknowledgment of the headship of Athens. Now, a very cursory glance at the frieze will show us that the artist of it solved all these problems satisfactorily. First, he has given us two processions, clearly marked as distinct by separation and difference of direction; and, by introducing cattle and other objects of sacrifice, he has shown us their purpose. Second, he has distinguished the two processions as Doric and Ionic, by making the one approach the gods specially worshipped by the Dorians, the other the gods specially worshipped by the Ionians. Since the two races differed but slightly in appearance and attire, it is difficult to see how they could have been otherwise distinguished than by their gods, who, as we shall see, had to be introduced for another reason as well. To demonstrate that the gods are distinguished as Doric and Ionic would require a somewhat lengthy discussion. At present the fact must be provisionally accepted. Third, the artist has shown that the sacrifice has reference to a multiplicity of gods, by introducing these gods themselves, and we may safely assert that he could not have accomplished his purpose otherwise. Fourth, he has shown that the

object of the sacrifice is to bring about reconciliation and union where there was previously alienation and division, by making the favouring gods of the one people turn their backs upon those of the other, while the two processions approach each other and also a group standing between the averted gods and preparing for a ceremony, which must make these turn toward each other and unite in a common acceptance of offerings. How skilfully this middle group is managed, so as to express the act of reconciliation, will be shown hereafter. Fifth, the artist has shown the effect of the union will be the acknowledged headship of Athens, by placing her chief divinity in a place of honour equal to that of Zeus.

#### Da Vinci's "Mona Lisa."

W. H. PATER.

*La Gioconda* is in the truest sense Leonardo's masterpiece. In suggestiveness only the *Melancholia* of Dürer is comparable with it, and no crude symbolism disturbs the effect of its subdued and graceful mystery. We all know the face and hands of the figure set in its marble chair, in that cirque of fantastic rocks as in some faint light under sea. The presence that thus so strangely rose beside the waters is expressive of what in the ways of a thousand years man had come to desire. Hers is the head upon which all the ends of the world have come, and the eyes are a little weary. It is a beauty wrought out from within upon the flesh—the deposit, little cell by cell, of strange thoughts and fantastic reveries and exquisite passions. Set it for a moment by one of those volute Greek goddesses or beautiful women of antiquity, and how would they be troubled by this beauty into which the soul with all her maladies has passed! All the thoughts and experiences of the world have etched and moulded there—in that which they have of power to refine and make expressive the outward form—the animalism of Greece, the lust of Rome, the reverie of the Middle Age, with its spiritual ambition and imaginative loves, the return of the Pagan world, the sins of the Borgias. She is older than the rocks among which she sits; like the vampire, she has been dead many times and learned the secrets of the grave; and has been a diver in deep seas, and keeps their fallen day about her; and trafficked for strange webs with Eastern merchants; and, as Leda, was mother of Helen of Troy, and, as St. Ann, the mother of Mary; and all this has been to her but as the sounds of lyres and flutes, and lives only in the delicacy with which it has moulded the changing lineaments and tinged the eyelids and the hands.

#### Raphael and Da Vinci.

G. BUTLER.

What would have been the effect on Raphael's mind and style of painting had he remained a longer time under the influence of Leonardo is not an uninteresting question. Nay, we may carry it back to his early training and ask—"What would Raphael have been had he been brought up in the school of L. da Vinci instead of that of Pietro Perugino?" Let us transport ourselves to the great room at the Louvre, where we have specimens of Raphael's early Florentine or Peruginian manner; of his later Florentine, and of his Roman manner; and where we have also two noble specimens of Leonardo's easel pictures. Now, if we take the quality of expression—meaning thereby the thought and sentiment conveyed by the human countenance, and, in a less degree, by the attitude—Raphael's pictures stand the comparison with Leonardo's very differently. The earlier ones—the *St. George* and the picture called *La Belle Jardinière*—are thrown somewhat in the shade; but there is a chivalrous determination in the attitude of the warrior saint that shows thought and purpose in the artist, and the exquisite purity of the Virgin's expression, the charm of her oval face and downcast eyes are things *sui generis*—very delightful to the feelings if not suggestive of deep thought. But the great *Holy Family* and the *St. Michael* are positively killed by Leonardo's proximity. They may have possessed a more spiritual character when Francis I. first received them; but, as they are now seen, they wax pale—as regards the quality of expression—before the *Santa Anna* and the portrait of *Mona Lisa*. The comparison of Leonardo's (or his pupil's) *La Vierge aux Rochers*, with Raphael's *St. Marguerite*, in the long gallery, is equally unfavourable to Raphael's pretensions to the character of a thoughtful painter. It may, of course, be said that Raphael's fame does not rest on his oil-pictures but on his frescoes, and his cartoons for the tapestries. Neither does Leonardo's rest on his easel pictures, but on his cartoon of the *Battle of Anghiari* and his *Last Supper*. Putting these facts together and speculating thereon, it does appear more than probable that Raphael, had he studied under L. da Vinci instead of Pietro Perugino, would have learned to portray qualities of mind which only now and then find in him a ready and congenial exponent. And he would, doubtless, have acquired a greater insight into the structure of the human frame, and more unerring accuracy in drawing the extremities. It will, perhaps, strike the reader



that the comparison of Leonardo's serious pictures with Raphael's later works, in which he did not aim at representing intensity of thought and sentiment, is unfair. Doubtless there is more similarity between Raphael's *Sposalizio* and his *Madonna del Granduca*, and Leonardo's *Vierge aux Rochers* and *Santa Anna*, than between any of Raphael's Louvre pictures and Leonardo's. It may be said, further, that where there is no identity of aim between two painters there can be no comparison between their works. Granted. But let us compare their respective aims. If we find one painter aiming at the representation of deep thought and sentiment, and the other at that of a greater variety of emotion; the one choosing types of countenance and attitudes which harmonise with a profound, tranquil, meditative spirit, and the other delighting in the various expressions which mark the differences of age and sex, and the easy and delicate play of graceful lines which diffuse joyous cheerfulness over the picture, we are surely at liberty to say which we prefer, and which aim we think the nobler. Moreover, when the latter painter has changed his aim, when we find that, at an earlier period, he placed before his mind a different object as attainable by his art, we may surely compare the purpose of his youth with that of his later years; and if the latter appear to us less noble, we may express a feeling of regret that he had not that inducement to persevere in his early motives which the example of Leonardo would have given him.

#### The Idea in Art.

J. S. BLACKIE.

The value of the Platonic idea may be shown by an illustration from the region of the beautiful. The marble figure, which some stone-working poet has baptized a Corinna or a Sappho, and whose features, expression, and attitude combine all that is most dignified in a queen, all that is most simple in a shepherdess, all that is most inspired in a poetic thinker, and all that is most attractive in a Venus—this figure, for the possession of which to adorn their museums the heads of great monarchies will contend with rival diplomacy and emulous gold, when dashed to pieces by a sudden precipitation, is only so much lime which the farmer can fling upon his land like straw or dung or any other refuse. Its value is gone as soon as it has lost its form; the material is common and worthless. Whence, then, is this form, this *eidos* (*species*), the superaddition of which imparts so much value to an otherwise trivial material? Whence did it come, and what is it? It is plainly neither more nor less than an image impressed by the plastic power of mind on a material utterly destitute of formative force; and the value of the work consists altogether in the amount of this force, or organising intellectual energy, which has been made to act upon it from without. But this formative force is a thing altogether bloodless and untangible. Shatter the substance of the finest statue in the world to pieces, and the amount of calcine substance or earthy matter of lime remains the same as before the disintegration. It follows, manifestly, that the only real element in the admired object is that which according to common phraseology has no reality in it, viz., the idea in the mind of the artist which has been transferred to stone. This idea is, in fact, the alone thing which truly exists so far as the work of art is concerned. It is the only thing also that possesses permanency; for whereas the marble may be broken at any moment, the idea may at any time be recovered from the intellect of the artist where it was originally generated, and where it permanently resides. That the ideas which belong to genius or original creative power are innate, in the highest Platonic sense of the word, most people will be willing to concede. For, if not, why cannot every eye see in a daisy as much as a Burns or a Wordsworth saw? Why is not the physiognomy of every dog as eloquent and as pregnant with profound expression to me and to you as it was to Landseer? A common observer "wants the eye" to see in common objects what the great artist sees—that is to say, he wants an internal plastic and organising force; for it is by this mental force only, and not by mere pupils, corneas, retinas, and other apparatus of mere sensuous vision, that the man of genius obtains his superior insight.

#### Italian Influence on French Architecture.

J. GWILT.

The earliest architect in France who may be said to have had a perception of Italian architecture was Jean Bullant, between 1543 and 1573. From a portico in the castle of St. Ecouen, he appears to have preceded the age in which he lived to such a degree that he must be considered the harbinger of good taste in France. The wars in Italy under Charles VIII., Louis XII., and Francis I., had made the French intimately acquainted with the works of Italy, and the taste of the last-named monarch particularly induced him to bring from that country some of their most celebrated artists, so that there was almost a colony of them in France. Amongst these was Vignola, who was many years resident in the country; and this may with some probability account for the great esteem in

which that great master's profiles have always been held in France, and, indeed, I may say in which they are still held, though in other respects French is rather founded on the Venetian school. Another architect of note, Sebastian Serlio, was engaged in the country by Francis, and died there. Buildings are to be judged of relatively as well as abstractedly; hence the opportunities of every class which the period afforded must be taken into consideration before the powers and merits of an architect can be properly appreciated. In this respect Lescot's works at the Louvre are entitled to great praise. He was the contemporary of Jean Gougon, the architect of the well known and admired Fountain of the Innocents, at Paris, which lost much of its beauty when, many years ago, it was taken down and its site changed. From the works of Bullant, Lescot, and Gougon, the progress of pure architecture, one might have supposed, would have been without check till it reached that point to which it had been carried in Italy. Such, however, was far from being the case. Mary de Medicis, who was a native of Florence, but afterwards a resident in France, anxious when she was about to build the Luxembourg Palace to have it designed in a manner which would remind her of her native city, made her architect, De Brosse, adopt a style, as nearly as circumstances would allow, resembling the palaces of Tuscany. The rustic work of the Pitti Palace seems to have been uppermost in the mind of the architect, but his version of it is a failure. In Florence the palaces are on so gigantic a scale that they can bear out the rustic and embossed work employed upon them; but when reduced in size, a building in which they are used allows but sparing use of these practices. This palace became a model for the fashion of the day, and produced an intermediate style which lasted many years in France, and arrested the advances to perfection whereof the above works of Bullant and others gave promise. De Brosse was, however, an able artist, and well knew how to group his masses so as to produce great effect. His last work, the aqueduct of Arcueil, was finished in 1624, and it is supposed he did not long survive its completion.

#### Thinking in Stone.

A. WILSON.

There was a period of the Middle Ages when men thought in stone. Turning with dissatisfaction from the Latin hymns of Abælard, the rude grotesque miracle-plays, and the chiefly barren disputes of the schoolmen, to the cathedrals of Florence, Pisa and Lucca, of Nuremberg, and other towns in Central Germany and Flanders, the abbeys of England and Scotland, the Gothic castles, and even many rude robber strongholds, it is not difficult to see that the highest thought and feeling of the time found in those marvellous piles—those springing arches, calm falls of light, depths of shade, and doors whose beauty well deserved to last for aye—the most fitting representatives and vindications of the higher effort of man, of man making the earth more beautiful as it rolls among the stars, working according to the will of the Eternal Father, who looked down from above, consecrated to the work in the solemn place while yet a child; and even the memory of the proudest and most victorious perpetuated only by a recumbent statue with humbly clasped hands in acknowledgment of shortcoming, but undying aspiration. Each time has new wants, and the tendency has been toward more articulate forms of expression. The power of thinking in stone was lost, as thought found easier and distincter modes, and only imitations of what had been thought in that way were produced.

#### German Stellar Vaulting.

R. WILLIS.

A favourite vault in the After Gothic of Germany is, on the plan, an assemblage of lozenges formed into stars, which radiate both from the vaulting shafts and from the centre of the vaulting compartment; but in its actual appearance is an elegant and peculiar kind of fan vaulting. Vaults on this principle, and with a much greater repetition of parts, are commonly to be met with in the German churches. I suspect most of them are of wood and plaster, and in many of them the ribs are only surface ribs laid on to a waggon vault with Welsh vaulting cells, exhibiting examples of very simple vaults converted by surface ribs into very intricate ones. I would call this class of decorative vaults "stellar vaults," from the regular stellate form they assume on the plan. The principal distinction between these and our own fan vaulting is the substitution of lozenge-headed compartments in the fans for the English horizontal transom rib. We have also lozenge-headed compartments in our Early vaulting, but they are never so symmetrically arranged in stars throughout. Besides these stellar vaults, other intricate ones may be found at Munich Cathedral, the Frauenkirch, Frankfort, &c., of a kind totally differing from elegant English specimens, and in which the architect, forsaking grace and beauty, has degenerated into that fancy for producing difficult specimens of stone-cutting at the expense of architectural consistency, which is so much the character of the German After Gothic. In these the vaulting ribs are not placed symmetrically, and the vaulting cells are often oblique.



## NOTES AND COMMENTS.

THE Fine Arts Jury of the Paris Exhibition of next year have considered the question of the form which the diploma is to assume. Will it be one of the photographic reproductions which are now so much admired in Paris, or an engraving in the old-fashioned lines? Engraving has found favour with the jury, and the Minister will be advised of the conclusion. The certificate for the Exhibition of 1878 was designed by the late PAUL BAUDRY, and a photographic plate from it was issued. The painter was satisfied with it, and more than satisfied with one which appeared in this journal. But it is said by the jury that the certificate has not worn well. Copies which are in the possession of English exhibitors do not bear out that view. However, the test applied is the desire of the collectors to get hold of a copy. If the certificates are of any value to the exhibitors to whom they were awarded, it is strange that any should be allowed to get into the market. They ought to be prized and become heirlooms. It is said that the certificate of 1855 is a coveted addition to a portfolio, and it was an engraving by CALAMETTA from a design by INGRES. In England a good deal is also thought of engraved certificates. Sir FREDERIC LEIGHTON has a copy of STEVENS's for the Exhibition of 1851 hanging in his house; and DYCE's for the Exhibition of 1862 is also deserving of admiration.

MR. E. R. ROBSON is likely to have a very complicated lawsuit on his hands unless some arrangement can be made. A special committee of the London School Board, the chairman being one of the members, have proposed the following resolution for adoption: "That, in the opinion of the Board, the late architect of the Board is responsible for the absence of proper foundations at the Broad Street School, Ratcliff, Tower Hamlets, and that he be called upon to make good the loss arising therefrom." The case has for some time occupied the attention of a few of the members. In last April attention was called to cracks in the walls, and a test-hole was dug. The present architect to the Board reported that the foundations under the north-west wall, "instead of resting on hard ground, as they should do, stand immediately on a soft bottom of foundry ashes." Four additional holes were afterwards opened, and the measuring surveyor reported that, whereas the contract depth was said to be 10 feet, the depths executed were 7 feet 4 inches, 7 feet 3 inches, 9 feet 9 inches, while the depths paid for were 12 feet 8 inches in two places, 11 feet 9 inches, and 15 feet 6 inches. The concrete was described as being 6 inches or 7 inches thick, and lying under it "a mass of rubbish having no binding qualities." But whether the rubbish was put in with the foundations the surveyor could not say; the footings, he said, "seem to be built principally of old bricks." Mr. T. M. RICKMAN was called on to verify the measurements. In the course of his report he speaks of the concrete in one place as "composed of large lumps of slag and lime," in another place it has "unbroken brickbats and large lumps of slag," and "the mortar of footings is like black mud." Mr. RICKMAN says the site appears to have been a foundry, and the materials used for concrete seem mostly to be foundry refuse.

COPIES of the architect's and surveyor's reports were sent to Mr. ROBSON on June 13, and he was informed that the special committee proposed to recommend the Board to call upon him "to make good the loss occasioned to the Board" owing to their payment on Mr. ROBSON's certificate for work which has not been really done. Mr. ROBSON in the course of his reply said:—"The committee appear to have it in their minds that it was the duty of the architect to see everything personally, and that he should be held personally liable for the mistakes or misconduct of the officials acting under him, as well as of the builder. From the nature of my appointment, and the enormous pressure of work devolving upon me, the first was always known to be impossible in my case; and the second is, I venture to think, an unreasonable view. In addition to the clerk of works, an inspector of works had been appointed by the Board with the distinct object of relieving me from the bulk of the inspection, and he devoted his entire time to the work. My own inspections were directed more

particularly to points of light, ventilation, and other matters affecting the daily life of the school, of which the inspector could not be expected to judge. My certificate, when given, was based on the results arrived at by the surveyor. In every case it was given in perfect good faith, and to the best of my information and knowledge. I believe that any exceptions which may be found will only prove the rule that the great mass of schools are well built. And they have been produced at a cost per cubic foot little over that of cottage building. The Board Schools of London are to-day admittedly the best elementary schools in the world. No one can more deeply regret than I do the occurrence of anything tending, even in a comparatively small degree, to the discredit of a great work of which I have some right to feel proud. The proposal of the committee would be, so far as I know, entirely without precedent, and would affect not only me, but the whole profession to which I have the honour to belong." The case will be most difficult to decide, and the Board would do well to consider whether it is prudent to expend more money in providing a precedent.

SINCE SHAKESPEARE has a statue in Paris, although in an unsuitable place, the question, "Why is there not a statue of HONORÉ DE BALZAC?" must be more difficult to answer. The author, who is considered by many to hold the first place among French novelists, and who undoubtedly had most claims to be taken as the successor of MOLIERE, certainly deserves to have some recognition of admiration in marble or bronze. The literary societies have again taken up the subject, and as the first step in the revival is the giving of subscriptions instead of discussing the form of the statue and the sculptor who was to be commissioned, which was formerly the beginning of such business, the requisite money is not likely to be long absent. It is not expected that England will contribute much, for in no part of the world are his books less known than in England. Some exception may be made in favour of "Père Goriot" and "Eugène Grandet," but they are only a part of the great series of the *Comédie humaine*.

BRUSSELS has now an archæological society. It has existed for a year, but has not come into prominence until recently, when the members met in the great hall of the Academies. The acceptance by M. ALPHONSE WAUTERS of the office of President will do much towards raising the character of the society. In his address, the President discussed the question whether there was a poet named HOMER. He decided in the affirmative, and based his conclusion on the character of the poems and the unanimous belief of the ancients. M. LOË read a paper on the tumuli which are found near Boitsfort. It is hoped that the society may be enabled to undertake an exploration of them. M. DESTREE described a psalter in the Bibliothèque Royale of Brussels, which probably belonged to ROBERT BETHUNE; and M. MAHY read a paper on ERASMUS and his "Praise of Folly." There is much in Belgium that can interest the archæologist, and if rightly managed the Brussels society can do most useful work.

THERE is so much confidence in the strength of Paris houses no one need wonder when one is left without shoring, although the adjoining house may be entirely removed. Besides, shoring is always expensive in Paris owing to the quantity of timber which must be used. The builders seem to have overmuch faith in the strength of all materials except wood. A remarkable accident has just happened in Paris, which might have been avoided by the temporary use of a few balks of timber. A corner house was taken down in the Rue du Château-d'Eau, in one of the most crowded parts, but no provision was made to support its neighbour during the rebuilding. Soon afterwards a noise of cracking was heard, but the inmates of the unsupported house were not frightened. However, during the night one-half of the house fell over, burying several people in the ruins. It was discovered that the outer wall was of worse construction than is common in Paris, and the floors were not well tailed into it. Although much suffering was caused, as yet there are no deaths. The Municipal Council voted 1,000 francs for the relief of the sufferers.









HAMPTON COURT.

INK PHOTO GIRA F & C. MAITIN LANE CANNON ST LONDON E.C.









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THE JUDICIAL  
From the painting by



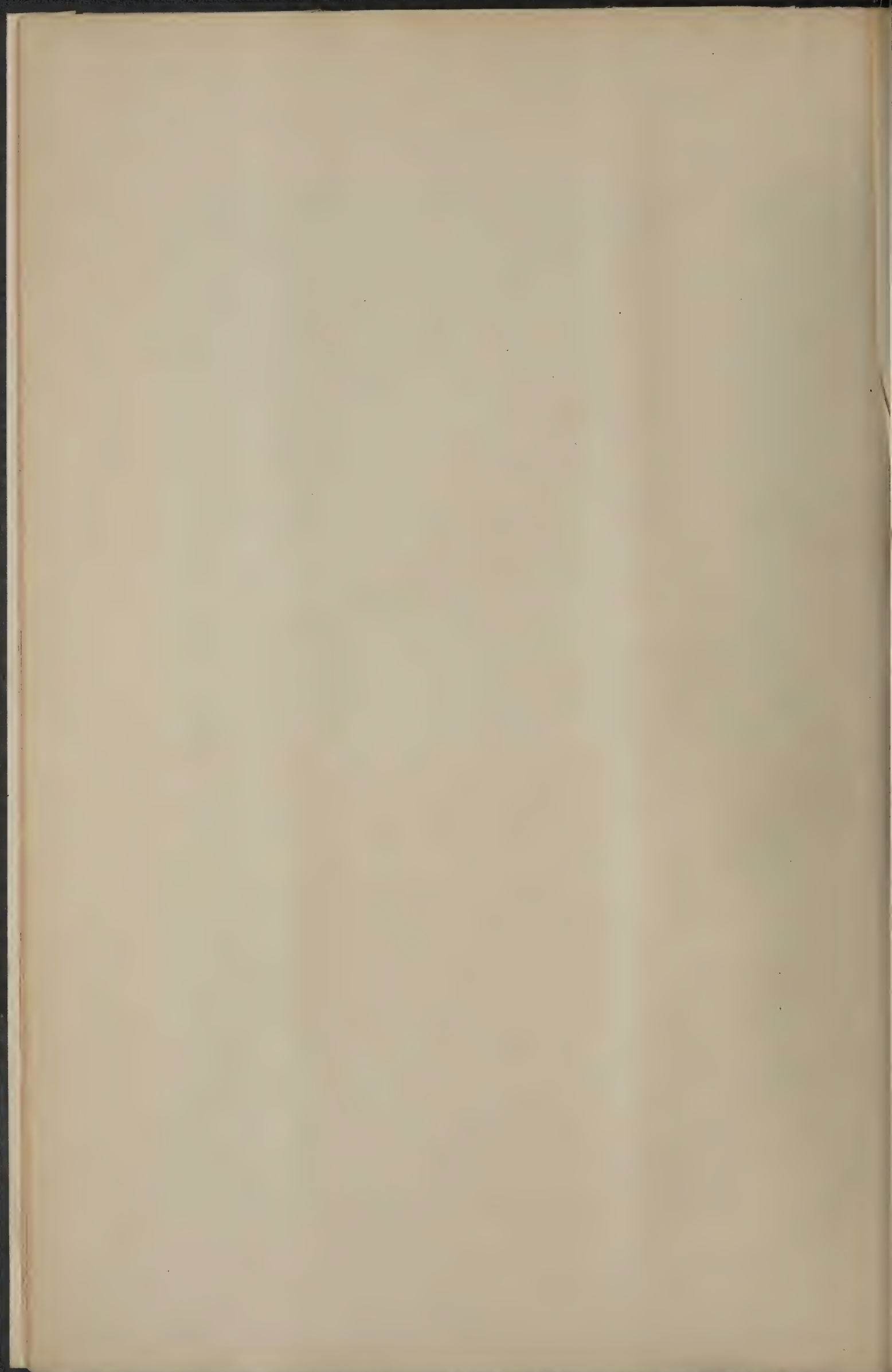


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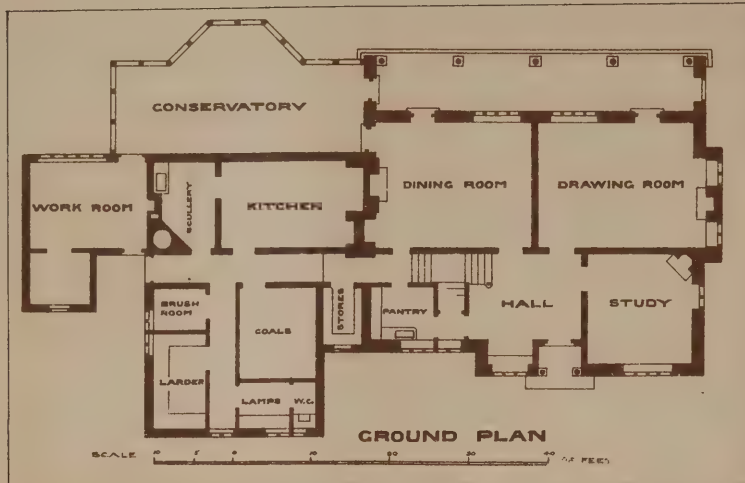














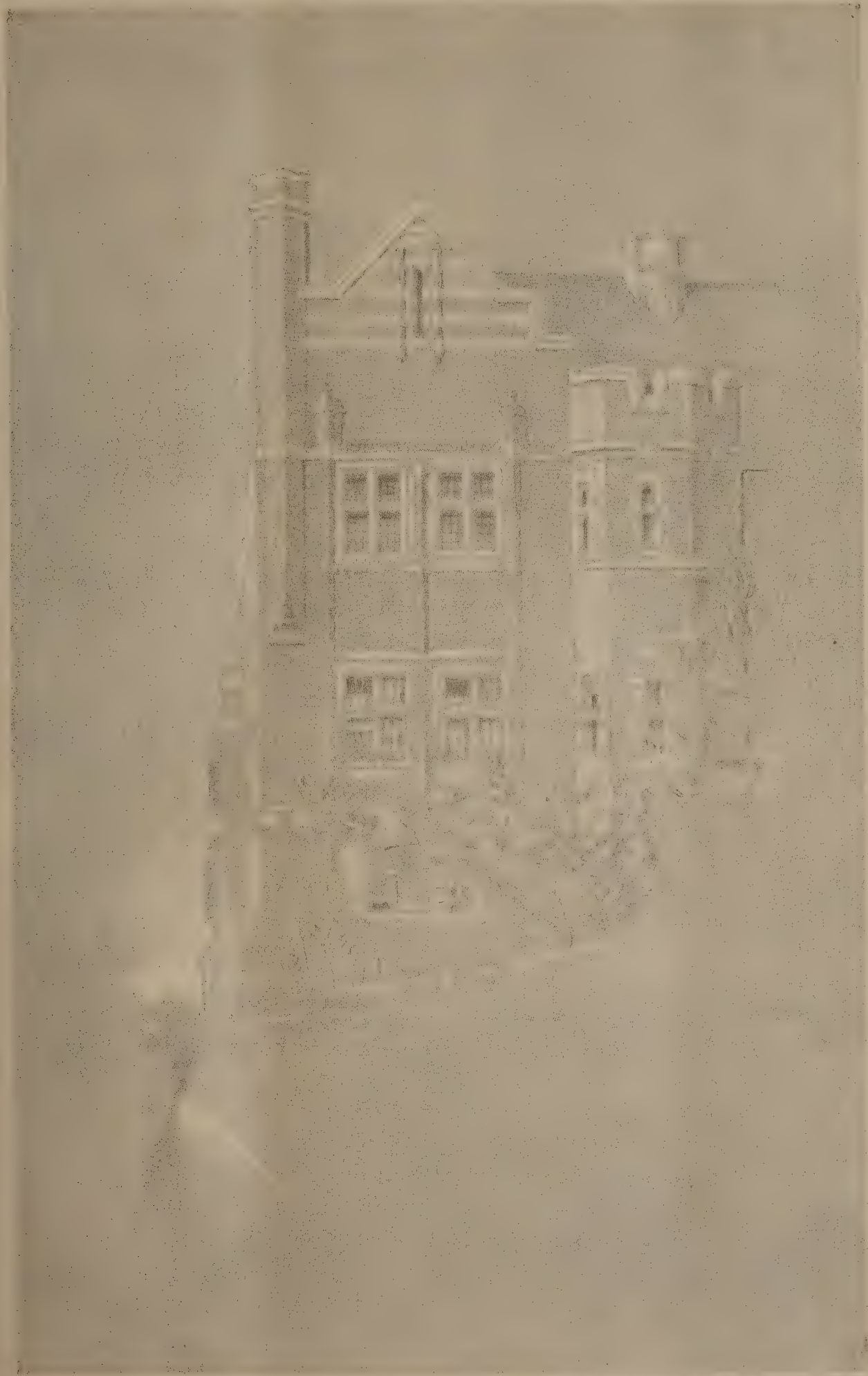


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HAMPTON COURT.







## ILLUSTRATIONS.

## A JUDICIAL RECONCILIATION.

AMONG the present representatives of the Antwerp School of Painting, there is not one who is more esteemed than M. PIERRE-JEAN VAN DER OUDERAA. This is as much owing to the artist's modesty as to his great abilities in painting. M. VAN DER OUDERAA does not pose as if he desired people to believe that he was one of the successors of RUBENS, for he is as unassuming as if he were no more than one of the ordinary burghers of the old city. Indeed, M. VAN DER OUDERAA takes his turn in all the duties of citizenship, and his name sometimes appears as a committee-man, and sometimes as a candidate, on the enormous placards which herald an election in Belgium. He does not put himself forward as an artist who has gained renown in other cities besides Antwerp, but as a plain man who is ready to make sacrifices for the municipality of which he is a member, or for a cause which has secured his faith.

The co-operation in public affairs has been rather advantageous to M. VAN DER OUDERAA. From his interest in proceedings of a judicial and civic kind, he is naturally led to consider how they were transacted in a former age, and M. VAN DER OUDERAA is able to paint such scenes as the one we illustrate with an air of reality that is sufficient to convert the most obdurate realist to a belief in the advantages of historical pictures. His works are revelations of the past. It was this quality of verisimilitude which made M. VAN DER OUDERAA appear in the eyes of the authorities to be the best qualified to paint pictures for the walls of the Law Courts of Antwerp.

The *Réconciliation Judiciaire*, from which we are enabled by the courtesy of M. VAN DER OUDERAA to publish a plate, is not in the Law Courts, but in the public gallery of Antwerp. The reconciliation was one of those scenes which exemplified the Christian spirit which so far prevailed in Antwerp as to inspire the laws. When, as sometimes happened, men fell out, and one was killed, the life of the murderer was, of course, forfeited. Indeed, in those days death was the penalty of more venial offences. But the Antwerp judges were honest enough to feel that they could relish passion, and that "the rarer action is in virtue than in vengeance." The culprit's life could be saved, but in a nobler way than by the granting of an emperor's or a governor's respite. If the man or the woman who suffered most by the loss of the man who was slain could be persuaded to believe that the office of mercy was to confront the visage of offence and to accept a kiss of peace from the murderer, then he was pardoned.

But the reconciliation had to be conducted under prescribed conditions in order that it might be entirely deliberative. The first officer of the dignity known as the Amman had charge of the arrangements. He was known as the *lange roede*, from the rod he carried. He selected men to represent the accuser as well as the accused, and they could nominate an umpire in case any difference of opinion arose between them. If the reconciliation was agreed to, the final ceremony took place generally in a chapel dedicated to the Blessed Virgin. The procession was made up of the *lange roede*, the arbitrators, ushers, and inferior officers of the Amman. The culprit walked with them, clad in the way shown in the illustration—that is, barefooted and bareheaded, wearing a white shirt, and bearing a long straw in his hand, evidently with the intention of recalling CHRIST's passion. The nearest representative of the murdered man, his eldest son or eldest daughter, also came surrounded by relatives and friends. The culprit humbly begged pardon from them for CHRIST's sake. If no sudden impulse intervened to alter the arrangements, a token of pardon was offered by allowing a kiss to be given by the murderer. The clerk of the *lange roede* completed the ceremony by reading the formal record of the reconciliation.

In the original picture the lady who makes a sacrifice of her resentment appears like one who has come from the tomb. The torture of the ordeal is for her more exhausting than for the murderer, although he is not oblivious of his crime. The other members of the family of the victim are represented as under different emotions. The old father may be supposed to feel that—

We do pray for mercy,  
And that same prayer doth teach us all to render  
The deeds of mercy.

But the two sons are compelled to keep their looks from the murderer, and the clenched hands of the youth as he holds his cap suggest that he also is not satisfied.

The picture is finely coloured, and indeed no work in the gallery where it is placed leaves a more lasting impression on the mind of the visitor.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NOS. 1, 2.—SKETCHES AT HAMPTON COURT. [E. G. HARDY.]  
NO. 3.—FOX OAK. [H. RICARDO.]

## THE ST. GEORGE'S BATHS COMPETITION.

THE following correspondence has been sent to us for publication:—

*To the Vestry of St. George, Hanover Square, re New Baths and Washhouses.*

9 Victoria Chambers, Westminster: June 5, 1888.

Gentlemen,—I have been requested by some of the architects who were invited to compete for the above to express their feeling of dissatisfaction with regard to your decision in the above competition. The competitors were assured in the instructions from the Commissioners that an architect of established reputation should act as assessor, and as in the cases of the Admiralty and War Office, the Law Courts, the Glasgow Town Hall, the Manchester Town Hall, and all public competitions, this was understood to imply that the assessor's decision was to be final and binding, unless some just cause could be assigned for acting to the contrary. The competitors are surprised to find from the Commissioners' report that they have rejected the design which the assessor selected, and moreover have declined to produce his report. And, further, that the design selected by the Commissioners, according to their own statement, is defective, and will require "to be considerably elaborated and a few modifications" made in it. They are also surprised that, as the selected design cannot be carried out for the amount stipulated in the instructions, viz. 30,000*l.*, that this fact of itself did not disqualify it. As the competition has entailed a large expenditure of time and labour on the competitors, they respectfully request that you will in justice to them reconsider your decision, and act on the assessor's award, and also publish his report.—I have the honour to be, Gentlemen, yours obediently,

JAMES WEIR, F.R.I.B.A.

St. George, Hanover Square  
(Commissioners for Public Baths and Wash-houses),  
1 Pimlico Road, S.W.: June 29, 1888.

Sir,—Your letter, dated 5th inst., addressed to the Vestry, was read to the Commissioners at their meeting yesterday, and I was instructed to inform you that the Commissioners see no reason to take any further action in the matter.—I am, Sir, your obedient servant, (Signed) F. W. DOGGETT, Clerk.

James Weir, Esq.,  
9 Victoria Chambers, Westminster, S.W.

## LICHFIELD CATHEDRAL.

IN commencing the restoration of the south window of the Lady Chapel, a work which has been long needed, it was discovered, says the *Staffordshire Advertiser*, that the mullions, apparently of stone, were nothing more than Portland cement, plastered round an iron core, which, by rusting, had so disintegrated the cement that on being touched it crumbled away. This was the case with all the mullions save the centre one, which was of inferior stone and not of the same nature as the rest of that part of the cathedral, whilst the mouldings were inferior in design. This incongruous work was probably done at the end of the eighteenth century, when so much of the other bad work was done. The work of the restoration of the east end is progressing surely, if slowly, and three windows have been taken out and replaced in a perfect manner, including the east window. New figures have been placed in two southern buttresses of the Lady Chapel, and the stonework on that side generally restored under the watchful care of the Dean. This part of the cathedral being named the Lady Chapel, the Dean has arranged for the niches in the restored buttresses to be occupied by figures of female saints from the Old and New Testaments. In the upper niches will be placed the Old Testament figures, and in the lower the New Testament figures. In



the buttresses already restored at the south and south-east angle of the Lady Chapel the figures placed are those respectively of Rachel and Phoebe, and Miriam and Lydia; whilst in the buttress further eastward the figures of Deborah and Martha are about to be placed. In the buttress now undergoing restoration the figures are to be those of Rebecca and Elizabeth.

### THE CHURCH OF ST. MICHAEL-LE-BELFRY, YORK.

A MEETING of parishioners will be held on the 24th inst. to consider what steps should be taken to preserve the above church, which is at present in a dilapidated condition.

The following is the report of the architects, Messrs. Demaine & Brierley, upon the building:—The stone used is from the neighbourhood of Tadcaster, and of the same species as that of the Minster. It appears, however, not to have been very well selected, and a good deal of the work, especially the carved and moulded parts, are in a very rapid state of decay. The mullions, jambs, arches, and tracery of the windows are in a very dilapidated and crumbling condition. In several places the stone is almost worn through and unsafe. The whole of the weathered or decomposed stone should be very carefully cut out, and new stones worked to the same sections let in. This will incur taking out the glass, which should then be refixed, and it will probably be found necessary to renew several of the stay bars and the casements. The moulded and panelled string under the windows on the south side is very much weathered and decomposed, although we understand it has been replaced within the memory of old parishioners still living. This is owing to its not having been set on the quarry bed of the stone. Almost the whole of this on the south side should be cut out and renewed. Parts of the moulded plinth and cornice and many of the stones in the ashlar walling, buttresses, &c., are very much worn, and should be cut out and renewed, and it would greatly improve the appearance of the church if the pinnacles were again provided to the tops of all buttresses where they are missing. Several stones of the mullions of the belfry are much worn, and should be cut out and renewed without delay, as the exceeding lightness of the structure leaves a very small margin of stability. There have been small pinnacles to the tops of the angle buttresses, which should be replaced with copper ties. The clerestory windows are in somewhat better condition, and we have not included them in this report or estimate.

### THE ARMS OF BATH.

IT appears that the representation of the arms of the city of Bath, which Major Davis, the architect, has set up in the Guildhall, does not meet with the approval of the authorities, who doubt the accuracy of the heraldry. The following defence of his design was written by Major Davis, and appears in the *Bath Herald*:—

Gentlemen,—The correct representation of the arms of the city of Bath is of such public interest and importance that I thought it advisable to make a written statement, which the public will be capable of estimating, and I must ask your patient attention for a few minutes, while I review the question so far as it concerns myself. As I have been given to understand, some gentlemen are prepared to charge me with having incorrectly represented the city arms on the Guildhall, and, if this attack fails, others are then ready to come forward and blame me for not having consulted my committee. On the first count I hope to be able to demonstrate that I have been faithful to historic truth. On the second count I shall have to remind you that this historic truth was authoritatively settled in 1862, and that the principle then accepted by the Corporate Property Committee has been continuously followed by me as a perpetual instruction on various occasions, which should be within the knowledge and memory of some of you, without calling forth censure or even criticism. If, therefore, the first part of the charge breaks down, the second must fall with it. Shortly after I was appointed in 1862 to succeed the late Mr. Manners, as city architect, I began to emblazon the city arms on a seal to be used by myself in the exercise of my office, but finding that according to the rules of marshalling and emblazoning arms I could not represent in the correct proportions the "two bars wavy" in chief, I applied for instructions to the Heralds' College in London. The Heralds' College, or more properly the College of Arms, is an institution held under the Crown and presided over by the Duke of Norfolk as Earl Marshal, whose officers are three kings at arms, six heralds, and four pursuivants. No coats of arms can be authoritatively borne unless they have been sanctioned by the College of Arms, or registered in their books as being borne from time immemorial.

On making inquiries of this, the only responsible body, I was informed that the conventional arms of Bath were looked upon by the college as the unauthorised invention of an engraver (I believe the Dutchman Van Houe, 1610?) and that they were so noted in the college register, but that the ancient coat had a history commencing "from time immemorial." I had the satisfaction of seeing this record in the college books. I have also subsequently seen the original copy of the record of the last Visitation of Heralds to Somerset. A Visitation of Heralds was a commission appointed by the Earl Marshal, with the consent of the Crown, to require the production of all coats of arms and heraldic seals, in order that they might be confirmed or disallowed. The last Visitation of Heralds was held in the year 1623, at the "Harte Lodgings over the Kinges Bath;" and upon presentment of the Mayor and Corporation the ancient arms were again registered and allowed, as also the civic seal and that of the Mayor, but not the seal now in use by him. I was introduced to the Heralds' College by the Rouge Croix Pursuivant, Mr. Planché, who showed me the ancient arms, which in heraldic cant represented a City of the Waters—a signification which the spurious representation of the engraver could not boast. For further confirmation Mr. Planché, who was subsequently Somerset Herald, referred me to the arms of the city as they were modelled and "tinctured" in the ceiling of the nave of the Bath Abbey. Those arms of Bath were placed in their original position by Bishop Montague, Chaplain of the Order of the Garter, previous to his translation to the See of Winchester in 1616, and were within your memory replaced by Sir Gilbert Scott on the restoration of the Abbey.

I laid the result of my inquiries as to the correct arms of the city before the Corporate Property Committee in June 1862, and I was instructed to rehabilitate the ancient arms (see minute, June 1862) and to emblazon my seal at their cost (see Corporation accounts) with the correct arms, a copy of which I now lay before you. I had previously been so fortunate as to find hidden away beneath the roof of the Guildhall two metal maces, made in the year 1732 by the founder of *Keene's Bath Journal*. I was requested in pursuance of the minute of the Corporate Property Committee to have the arms of Bath engraved and also painted on these maces, according to the version of the arms as registered at the College of Arms. I obeyed my instructions, and these maces, bearing each two coats of the correct arms, have been carried before the Corporation in all processions or visits of ceremony. Since that date (1862) the Corporation have in all matters in which I have been employed had the correct arms used. I would first mention the arms in the east window of the abbey. By your request I prepared a drawing of the coat of arms to be used for the heading in all advertisements in the public papers, which has uniformly been used, also for the heading of the summonses to the Council and sections of the Council, but the printer thinking the spurious arms the prettier has not been invariable in his allegiance. In 1864, at the meeting of the British Association, the correct arms, surrounded by the civic chain, were engraved for the service of the Mayor. This seal was largely used on the occasion, and most of the succeeding mayors have preferred this heraldic shield for invitation cards, &c., to the modern version of the ancient gateway that has displaced the authentic seal. The album issued in the mayoralty of Mr. Alderman Bartrum to the lodging-house keepers has the correct arms on every sheet, and also to a larger scale on the binding, also the subscription books at the Baths, and the several works on the Baths and Bath which have been bound at your expense. At the Health Exhibition in London, in 1884, a banner, which was embroidered on a large scale with correct arms under the superintendence of a councillor of the Bath Corporation, was placed over the Bath exhibit, and attracted much attention from the visitors. This was afterwards sent to the New Orleans Exhibition. The books on the Baths which I had the honour of presenting at your desire to Her Majesty, and also to the Princess of Wales, had the correct arms executed at very considerable expense on costly binding. Mr. Peach, in his "Historic Guide," placed the correct arms from my drawing on the covers of his books, and Mr. King and your deputy town clerk, Mr. Watts, did likewise in their recent work on the Municipal Records. Mr. Alderman Hunt's portrait in the banquetting-room has the correct arms marshalled with his own.

Errors are difficult to overcome. The badge you have placed on the police bears the spurious arms, and the Bath College Company, ignoring heraldic lore, have been likewise faulty in heraldic grammar. I am in no way to blame for these mistakes, neither is it my fault that your Mayor's badge is also "ignoble" heraldry, as that was given by the citizens to Mr. Alderman Dowding, when Mayor, twelve years previous to my appointment. The city maces, bearing the incorrect arms, were purchased in 1708, but when I mention that the ancient maces of the city formed a portion of the purchase money for the new maces, you will see that our ancestors in the time of Queen Anne were not much influenced by a historical spirit or by a veneration for antiquity, and therefore not likely to have



been careful that the ancient arms should have been placed on their newly-made maces. The discarded maces are, it is believed, those carried at the present time before the Mayor of Stratford-on-Avon.

I must apologise for going so fully into particulars, but I am compelled to state my position, and I could not do so in any other way. I consider that I should have no justification for inserting or using a false armorial bearing on any work which you may commit to my care; but, at the same time, I believe that without your instructions I should, as a matter of taste, permit a decoration on your buildings erected in the past, false heraldically as it may be, so to remain, if it were possible not to interfere with it. I can point as an illustration to the way I have decoratively treated the arms in the banqueting-room and in the common hall.

The restoration of the Guildhall front revealed a state of decay not anticipated, and when I examined the city arms as there represented, I observed that the stone carving was so detached that no piecing the shield was practicable. If this had been possible I should have at once patched and retained the false emblazonment; but I found that to retain the bearings I should have been obliged to place an entire new stone. A new stone would have entailed a new shield, which I should have been bound under the minute of 1862 to replace with the ancient authorised arms. A practical man will understand me when I state that the extreme projection and indentation of the carving taking the place of where the new work would have to represent water, made the transference in the old material possible; so I decided upon executing it in this way—a procedure for which I claim justification.

I have seen a letter from the Mayor, in which he states that the water was shown above the battlements in the conventional shield. Let me assure you that what his Worship describes as water should rather be called "streamers" or "bars wavy," and that as I have represented the arms there are no battlements so called, but square piers, as of a bridge through which the water (the mineral water) is flowing. His Worship also speaks of applying to the Ulster King-at-Arms. The Ulster King-at-Arms is an Irish Herald, and could only speak as a layman, and without official authority in matters of English heraldry.

If I am considered to have committed an error on a point of heraldry the committee can obtain from the Garter King-at-Arms, or the Somerset Herald, the opinion of the College of Arms, which would be of the greatest value.

I have now, gentlemen, laid before you facts sufficient to prove that the city arms now placed by me on the Guildhall have not been, as some would have you believe, designed capriciously and without precedent, but in a spirit of faithful adherence to historic truth as authoritatively laid down by the Heralds' College and so accepted by you in 1862; and the general principle then established and subsequently carried out by me on various occasions, without evoking censure or even criticism, I have always regarded as a perpetual instruction.

## THE CISTERCIAN ABBEY OF LOUTH PARK.

THE members of the Louth Antiquarian and Naturalists' Society were lately conducted over the ruins of Louth Park Abbey by Alderman James Fowler, architect. In addressing the members, he observed that little was known of the history of the abbey beyond the foundation and the dissolution; not even could a complete list of its abbots be made out, and but little of its once grand buildings remained from which could be traced their architectural features. The grassy mounds told of its size and arrangement, and doubtless under these mounds some treasure might be found which would enable a complete plan to be made. The foundation was of the Cistercian Order, and was one of the earliest of the offshoots from the head of the Order in England, viz., Fountains. The church was the central feature. This was of large size, being in length 256 feet and 61 feet wide. The transepts were 125 feet across, by a width of about 48 feet, including the chapels. The chancel was about 40 feet long and 26 feet 6 inches wide, and was nearly as large as the parent church of Fountains, being only 6 feet shorter. It might be taken roughly as about half the size of Lincoln Cathedral. Its construction was most massive, and judging from the remains of one of the pillars, the walls were about 6 feet thick. The style of the building was what is called Transitional, or the change from Norman to Lancet work, and it was in these buildings that the Pointed arch was first introduced. Buildwas Abbey, founded in 1135, was said to be the earliest example of this work, but as other buildings were then being erected it is not easy to say which is really the first. It was not, however, completed at once, because there were fragments of mouldings of the succeeding style, and it was hardly to be supposed that such a grand work would be completed in a short time. Some portions of the west end of the nave, one of the pillars of the north arcade, the north and south

walls of the chancel for some height, and the east walls of the same and the transept chapels are the only portions remaining above ground, but the wall of the north aisle of the nave may also be distinctly traced. All the monastic buildings were on the south side of the church, and were, as usual, arranged round the cloister. This was about 120 feet square. The chapter-house on its eastern side was about 50 feet by 30 feet, and had a vaulted roof supported by six pillars, and from the remains found it was possible that it was not erected until the early part of the thirteenth century, Richard de Durham then being the abbot, in 1246. The site was a peculiar one, being open and exposed, but it was well protected, having a broad moat around it, enclosing some twenty-three acres, and within this was another and smaller moat enclosing the main buildings. These moats were supplied with water brought from St. Helen's spring at Louth by a dyke cut by the monks, which still bears their name. The inner moat was enlarged considerably on the north-east of the abbey, and formed into a large fish-pond. These moats were now dry, the water and the dyke being conveyed along the south side of the abbey to and through the adjoining parish of Cockerington. The material used in the erection of these buildings was chalk, but the external walls and pillars were either of green sandstone or Yorkshire limestone. For a period of about 400 years, viz., till 1535, this grand monastery flourished, and had considerable possessions in various parts of the country; and in 1291, when it was probably at its best, their value was 246*l.* 9*s.* 3*d.*, when there were 66 monks and 150 conversi or lay brothers, making 216 to be provided for daily, besides strangers. The income was so mismanaged that at the dissolution in 1535 it amounted to 147*l.* only. The Abbey of Louth Park was founded by Alexander, Bishop of Lincoln, 1123-48, and in 1139 a company of monks, who had been sent from Fountains, commenced the erection of their home in the Bishop's Park at Louth.

## ARCHITECTURAL DRAWINGS.\*

WE speak loosely of architects exhibiting "examples of their works," and we annually see articles headed "Architecture at the Royal Academy" and elsewhere, and there is small blame to the public if they are misled by such expressions and if they utterly lose sight of the fact that in the nature of things it is impossible that a work of architecture can be exhibited except where it stands. It seems almost as if architects themselves were in danger of falling into the same forgetfulness. This would not merely be a mistake, but a calamity. Nothing perhaps has done more to degrade architecture both as a profession and as an art than the popular misconceptions which these exhibitions tend to foster; and the question whether such exhibitions ought not to be entirely discontinued is one which demands the most anxious and careful consideration of every one who is really interested in the art.

It is probable that for reasons quite apart from the interests of art such exhibitions will continue. It is therefore all the more incumbent on us on all fitting occasions to protest against the idea that they are exhibitions of architecture. They are exhibitions of drawings of architecture, which, as we shall presently see, is a very different thing. Many of these drawings possess great artistic merit, even when the architecture they illustrate is contemptible, but it may be fairly suggested that if the interest is to turn on the work of Haig, or Brewer, or Davidson, it would be very much better to leave these artists free to work at their best among the monuments of Westminster or the terraces of Mont St. Michel, rather than under the harassing limitations which the modern designer is obliged to impose. But the very best efforts of the best artists cannot enable the architect to exhibit his art in the same sense that the sculptor or painter exhibits his. The architect acknowledges no superior in the world of art, and before his masterpieces the greatest achievements of the sister arts sink into comparative insignificance, but in the modern exhibition he cannot possibly assert his pre-eminence. The truth is that between the exhibition work of the architect and that of the painter or sculptor there is absolutely no analogy: so true is this, indeed, that it is not even possible to imagine corresponding limitations applicable to each. If, for example, the sculptor could only exhibit a part of his statue—a half either way, or even a leg only, or a hand—he would not be in the same unhappy case as the architect represented by a perspective drawing; because he might still make what he did exhibit perfect—a faultless example of the sculptor's art; but the architect can only hope to make the perspective a faultless specimen of another art altogether—the art of the etcher, not of the architect. The beauty of detail, the harmony, fitness, truth, sublimity, are not there, and cannot possibly reach the mind through the medium of pen and ink. In the same way the painter, if denied the use of colour and restricted to black

\* From an essay by Mr. J. Honeyman in the *Scottish Art Review*.



and white, would not labour under the same kind of disadvantage as the architect. He would still be free to show his best in monochrome, and in spite of the limitation might produce a consummate work of art—the painter's art; but there is no such possibility open to the architect: a consummate specimen of his art can only appeal to the imagination and the emotions through the medium of stone and marble, oak and cedar, gold and azure.

Again, whatever style may be adopted in illustrating a piece of architecture—whether etching, monochrome, or water-colour—the drawing is necessarily in a double sense conventional. It is conventional not merely in the sense that painting, sculpture, or architecture itself is conventional—namely, subject to the restrictions which the materials employed by the artist impose—but in the further sense that it is a conventional way of representing a conventional thing. A painting is not; it is the thing itself. So is a piece of sculpture; so is a piece of architecture. But a drawing of any of these, however excellent in itself, is after all only a conventional representation of them. It is comparatively uninteresting and valueless, and the less it does justice to the original the less it is esteemed. No one who can paint would dream of resting his reputation on the popular appreciation of such imperfect presentments of his art. He, jealous for his art, would refuse to exhibit if he had always to submit to such misrepresentation; but the architect who exhibits has no alternative—he must, in short, submit to be misrepresented. Besides, it must not be forgotten that, while it is possible to represent conventionally, by drawing, sculpture, or painting, so completely as to give some adequate conception of the whole work, it is impossible so to represent a work of architecture. That can only be shown in part—probably an insignificant part. The immense difference which this makes will be readily understood by artists, but a simple illustration may not be amiss. In the Glasgow gallery, among the many good etchings, are two by Mr. Alex. M'Gibbon, of parts of Glasgow Cathedral. Consider how many such drawings would be required to represent even in this soulless, conventional fashion all the charms of that one magnificent work of art! The lifelong labours of a Prout or a David Roberts would yield but a sorry substitute for the original, and transmit to us not even an echo of its harmonious and impressive eloquence. So it is in varying degree, but unvarying certainty, with every work of architecture. The architect, like every other artist, speaks through his art, which even in these degenerate days may be made the vehicle of a noble language; but if he should masquerade as an etcher or a water-colourist, let him use the appropriate accessories and the appropriate tongue—not an unintelligible jargon; and above all things let him make it perfectly plain that he is not exhibiting himself as an architect, but that he desires his art to be judged by what he does in his true character, and by that alone. How different would our estimate be of the artistic merit of men like Inigo Jones or Wren if we had only their drawings to guide us!

### THE LIVERPOOL THEATRES.

**A**DJOURNED special sessions for hearing applications for theatrical licences were held last week. Sir James Picton presided.

The Chairman said that since they last met on the subject which had again brought them together a good many things had happened. There was a committee appointed by the magistrates to inspect the theatres, and with the able assistance of the city engineer and the city surveyor a thorough and complete inspection of all the theatres had been made, and a mode adopted with regard to the necessary precautions against fire and stampede. The best plan would be that the report which had been prepared by the committee should be read.

Mr. Ellis (magistrates' clerk) then read the following report, which was dated the 27th ult.:—At a special meeting of the city justices held on September 28, 1887, a committee was appointed to inspect the theatres within the city, with reference to the provision for the safety of the public in case of fire or panic. The committee was constituted as follows:—Sir J. A. Picton (chairman), Messrs. John Brancker, T. Holder, John Hughes, H. W. Meade-King, G. Behrend, H. H. Hornby, S. H. Holme, Henry Jevons, R. Gee, M.D., and William Oulton. After a thorough personal inspection, instructions were given to the city surveyor and city engineer to prepare plans of the buildings, and to present separate reports and recommendations as to the alterations necessary for the public safety. These plans and reports were duly prepared, and after consideration by the committee were brought up at a special meeting of the justices on March 21, 1888. The following resolution was thereupon carried unanimously:—"That the report of the committee be received and adopted, and that the committee be reappointed, with authority to carry out their recommendations, subject to such modifications as they may see fit to grant. The committee have held numerous meetings, have renewed their personal inspection

of the buildings, and have held various conferences and consultations with the lessees and their architects, assisted by the city surveyor. They have pleasure in reporting that they found on the part of the lessees every desire to carry out faithfully the recommendations of the committee. It may be interesting to the justices and to the public to make known the leading features and objects of the alterations agreed to which are now being carried out. The most important of all is protection from fire. It is an established fact that in every recorded case of fires in theatres the origin has been on or behind the stage, but in no instance has the fire broken out in the auditorium. If, therefore, a solid wall of sufficient thickness is built, entirely separating the two portions, the few necessary openings being fitted with iron doors, the only difficulty to be dealt with is the stage opening or proscenium. The combustible curtains hitherto adopted are dangerous in the extreme, and have led to very serious loss of life by the panics and stampedes arising from fright. Curtains of non-inflammable material have been adopted as at Exeter, but have failed in consequence of their flexibility and want of substance. The committee have had before them various designs and plans, and have inspected some which have been carried out, particularly that of the Prince of Wales's Theatre in London, which seems to comprise everything which can be desired for the public safety. The main requirements are (1) that the material shall be incombustible, consisting in great part of iron; (2) that it shall be rigid, not liable to be deflected or bent; (3) that the means of lowering or elevating it shall be ready, simple, and easily worked. There are several modes of carrying out this principle according to the extent of the opening and other circumstances, but all consist of double plates of iron, in one case hollow, the others filled in with silicate of cotton, which is incombustible. Even in the present state of the theatres, if these recommendations are carried out, there could be no danger of panic, since the audience might withdraw without danger in the most leisurely manner; but, acting on the report of the city surveyor, a number of alterations have been suggested—of widening the exits, providing additional openings, improving the staircases, and in some cases constructing additional ones. These have been agreed to by the lessees, and are now in progress in the following theatres:—Alexandra, Court, Rotunda, Grand (or Varieties), Adelphi. Nothing has yet been done at the proscenium of the Prince of Wales's Theatre, though the lessee has expressed his willingness to comply with the requisitions of the committee. The alterations at the other theatres are in progress, but cannot be quite completed before the licensing day.

The Chairman said that if the alterations in the theatres were carried out, as he had no doubt they would be, in accordance with the instructions in the report, the public might be perfectly satisfied that every practical precaution had been taken against fire on the one hand and panic or stampede on the other. He was very glad to be able to say that there had been every desire on the part of the lessees to comply with the requirements. The alterations were not all completed, but under the superintendence of the city surveyor there was no doubt they would be.



### A College of Architecture.

SIR,—As my remarks on this subject have appeared to you to merit the consideration of your subscribers, I shall be glad to be allowed to add a few words, as the desirability of converting the proposal into reality is acknowledged by all whose opinion I have asked; although there is, of course, some variation as to details which can only be settled at a general meeting of persons much more competent and experienced than myself.

The late lamented President of the Institute was not only an eminent practical architect but a man of very large general experience, and I have been so fortunate as to find that, in an address at the opening meeting of a session, he adduces many facts with a view to reform and improvement which appear to apply with equal force to this proposal for a college. He said:—"I feel bound to offer a remark on the present incomplete representation of architecture at the Royal Academy, and an expression of regret that the careful recommendations of the Royal Commission of 1863, which were intended to improve the character of that representation, have been totally disregarded." Here we have our honoured architectural leader lamenting that architecture is in bad case, but crying out to another Society, instead of his own, for help for the remedy.

Then as to "organisation," he says there are principles which may be established as a basis, e.g. examination and the constant interchange of communications relating to the art, science and profession of architecture. I am, therefore, an advocate for systematic teaching.



These few brief extracts show that in the opinion of the highest officer in our profession there is a crying want for some change that shall lead to improvement, rendering it easy and natural for our students to pass through such a bracing curriculum as will not only lay a sure foundation for future success, but will compel the public to look with as much respect upon an architect as it does upon a clergyman.

Commenting upon the President's address, the *Times* paper of the next day has the following remarks:—"There are good grounds for the President's statement that the apprenticeship system requires to be supplemented. The mere fact of a young man's having been the articulated pupil of a qualified architect is not a sufficient guarantee of his own qualifications. Some evidence of proficiency should be required further than that of having sat for a certain number of hours in an office."

The conclusion I draw from all this is that every architect should inform every parent proposing to place his son in the profession, that the first step will be a course of collegiate training which an office cannot supply. The arrangements might be such that the time occupied would be longer or shorter, according to the natural quickness or acquired knowledge of the pupil. I say pupil, because I think his articles might properly commence when he entered the college, it being understood that his master would take a personal interest in his work there, and perhaps occasionally invite him to the office when there happened to be something going on that it would be well for him to learn. All this, however, implies a college, which is the most economical means of giving a particular education to large numbers of persons.

If I am not over sanguine as to the advantages of this proposal, and, assuming that the college would be established in London, there can be little doubt if influence—easily obtainable—were brought to bear on the Royal Commissioners of 1851, a site would be given for the College of Architecture at South Kensington, which has the advantage of already-formed museums of art and science. The annual expenses of the college would be comparatively small, as all the required professors and teachers are resident in London.

The trouble, loss of time, and inconvenience to a young architect in obtaining anything like a satisfactory training, at the present time and under existing circumstances, as compared with the facilities he would experience of living for a few months in a college with its lecture theatre, laboratory, and work-rooms, are too obvious to require much urging. System and incitement would take the place of irregularity and chance. Instead of having to run hither and thither for a lecture on geometry or mineralogy, applied mechanics or experimental science, on chemistry or geology, he would find it going on under the roof of his domicile, at a time announced beforehand for his special convenience. In my article I forgot to include the physicians and surgeons among the professions having colleges. Thus all the important professions have felt the necessity of properly training their recruits by means of a college, except that of architecture, viz. the army, the navy, the engineers, the musicians, the surgeons, the physicians, and even the farmers.

Does it not, then, seem justifiable to attribute the admitted shortcomings in architecture—mother of all the arts—to our discreditable neglect and indifference? History shows that she will flourish only when she is warmly cherished, and persistently and untiringly cultivated with all the wisdom and knowledge that man has diligently acquired. Withhold this nourishment, and she quickly becomes weak, worthless, and debased. It was Thales and Pythagoras and Anaxagoras who originated the glory of Greek architecture. It was the possession of all the science of their age that enabled the Freemasons to cover Christendom with such marvels of architecture as have impressed us at Rheims, Milan, Paris, and Westminster with the weak and puny character of our own efforts, and the fear that on some grand opportunity happily presenting itself we might be found wanting in the very elements of success. Let us, then, hope that architecture will not much longer want its elementary necessity—a college for the adequate training of her disciples, so that in carrying out the work allotted to them they may be able to apply with marked effect the wonderful resources of modern science adorned with an art worthy of our epoch.—Yours, &c.,

THE WRITER OF THE ARTICLE.

[Should any readers desire to confer privately with our correspondent upon the subject of his letter, we shall be happy to receive and forward their letters.—ED.]

SIR,—It was with very great interest, but I must confess also with some little surprise, that I have recently read in your columns the article and correspondence advocating the formation of a college of architecture.

Why, sir, these gentlemen are advocating what already exists! True, there is no "Royal College of Architecture" under that name. But what's in a name? A good deal, some may say. Possibly. But often when a name has gone on for years and years, and has connected with it a sort of sacredness,

owing to its antiquity and associations, one becomes rather reluctant to change it. What I mean to say is, that in the Architectural Association we have a college—and a very popular and hard-working college—among whose students there exists as strong a feeling of *esprit de corps* as one could possibly wish to find.

Mr. Thomasson's project for a university, in its widest and most extended form, is, *prima facie*, a very taking one; but I am sure he will excuse my saying it is quite impracticable. Does he realise quite what architecture in the provinces is? Let me give him a little piece of information, which may serve to enlighten him a little on this matter. Some months ago a project such as he has indicated was set on foot, and it was thought that possibly, under energetic management, some national association or university might be founded. With this end in view a circular letter was sent to nearly every town in the British Isles, where there was a member of the Institute, and, where not, to the secretary of the local school of art. The recipients of these letters were asked "to furnish a few notes upon the position of architectural education in the town of — and surrounding district," and also to give their opinion upon the system of education that should be provided. A copy of the Journal of the Architectural Association was sent with the letter. What was the result? About 50 out of the 500 gentlemen addressed took the trouble to reply, and the majority of the replies we did receive were of a most unsatisfactory nature. "There is no architectural education here, nor is there any need for it." "The students in this town are divided into cliques, and would not on any account form themselves into an association." "It would be quite out of the question here to suggest the formation of an establishment for architectural education." "I am afraid your advances will be treated with the same apathy as have been those of the City and Guilds Technical Institute."

Now, sir, here we have an actual and determined effort made for the formation of a "University," and the result has at least convinced me that any attempt in this direction is foredoomed to failure. At all events, such a movement to be a success must be essentially local.

I hold almost the same objections to Mr. Hill's scheme. I cannot at all follow him in his assertion that "an art master to teach drawing, a professor of architecture to lecture on history, design, &c.," tacked on to an engineering school, will make a "complete school of architecture." The writer of the original article was surely nearer the mark when he said that a complete course of architecture was almost as complex and far-reaching a study as that for an Honour School in the B.A. examination at Oxford. Certainly; and I would therefore urge that, considering the comparative smallness in number of architectural students, a complete course of education can only be obtained by the concentration of our efforts in those educational establishments which already exist, and more especially in that great Metropolitan Association that has done so much in the past, and that means to do so much more in the future for the architectural student.

It may be urged against me that it is a serious undertaking for a young man to migrate to London for two or three years, and that the classes at the A.A. are merely evening classes, and, therefore, non-collegiate. For the first argument I am quite aware that it is a serious and expensive matter for men to come up to study in London, but then, if men want collegiate education they must pay for it. Medical students and law students have to do the same, and so must we. In support of this view I can only point to the many men who even now come up year after year from the provinces. At the last R.I.B.A. examination it will be seen that we passed men from Bombay, Adelaide, Rourkee College, India, and Melbourne, and I believe it is a fact that the Indian Government annually send one or two of their engineering students over to study with us. Then, again, for the second. Our classes are, it is true, mostly held in the evening, but then they are simply meetings for instruction and criticism. All the personal work and study, which is very heavy and exhausting, has to be done in the daytime, and when the student has liberty. And, moreover, the needs of those students who are not engaged in an office are very fully provided for by such institutions as Messrs. Baggallay & Millard's *Atelier* and Messrs. Tiltman & Wood's "College." Indeed, the system of study in the morning, recreation in the afternoon, study again in the evening, which is, I believe, the usual collegiate method of working, strikes me as being peculiarly adapted to architectural education in London at the present time.

I could dilate on this subject for some time longer, but space prevents. Let it now suffice to say that the best thing for gentlemen to do who are really anxious to promote the collegiate education of architects is to devote their energies to perfecting existing institutions, and, by founding local scholarships, to help those living around them to come up and study at our National College of Architecture, which



has been existing for so many years, and which all those who have studied, or who are studying within its walls, regard and venerate as their veritable *alma mater*.—Yours, &c.,  
OWEN FLEMING.

SIR,—Mr. Arthur Hill's letter last week has evolved another development to my scheme as then stated, and which, being a very important factor, I will therefore ask leave to bring forward now.

Mr. Hill's scheme is good, and on the "one" side cheap, but it is not inexpensive to the pupil himself. Attendance at university is beyond the reach of many—yea, most—which consideration is the main point of my scheme for a popular university on the S. K. system. Some there be who have weighed the Government method in their own particular private scales, and found it wanting. I cannot here enter upon that vexed question, but for the assurance of those persons I will show the one greatest difference between my proposal and South Kensington. In fact, the only likeness is in the administration of the whole; and now that I propose to add a travelling professorship to each one of the great divisional centres, the real difference will become more apparent. The young architect will be enabled to obtain the advice of all his seniors in his own city (and this will be most beneficial, as tending to correct narrowness of conception and a set officialism), he will be able to get all the books he should have; and as the professor attached to the centre of the division to which he belongs will periodically visit each district town, the student will not only be able to hear first-class lectures "at least once a quarter," but will be able to obtain the professor's valuable advice on any matter in difficulty. Not the least of the many and great advantages accruing therefrom would be that the professor might so prepare his lecture in each town as to illustrate it from the architecture—ancient and modern—in that city, thereby giving the students invaluable lessons in criticism, and providing them with a standard in their own midst. The happy results of such a procedure will be fully appreciated by all who have read Ruskin's "Lectures on Architecture" delivered to the good people of "Edinboro' City fair." The professor could conveniently arrange his chief lecture-room in the chief college in his centre: e.g. Mason College, Birmingham, would be the head-quarters of the Western Midlands.

Some such arrangement could not fail to commence to influence architectural style and building in a "truly" original and striking manner within two generations of pupils, taking a pupilage at four or even five years' duration—that is, in about one decade (ten years).

Such, then, is the main outline of the only scheme with which I am at present acquainted, which is likely to be of real use, and, as in the case cited above (Birmingham and its college), includes the making use of existing colleges, as suggested by Mr. Hill.—Yours very truly,

FRÉDÉRIC E. THOMASSON.

Worcester: July 3, 1888.

P.S.—A misprint occurred in my letter last week. In line 14, fol. 376, the word "provisional" should have been "divisional" or "provincial"—either.

### CHURCH BUILDING AND RESTORATION.

**Brindle.**—The old parish church of Brindle, near Chorley, has been reopened after restoration. Some time ago the galleries in this church were considered unsafe, and Mr. James Bertwistle, F.S.I., architect, of Blackburn, having been called in to make an examination, found that the whole of the beams were decayed with dry rot. It was immediately decided to close the galleries and entirely remove them. This has been done, and the whole interior of the church has been decorated. The exterior has been restored and pointed, and the old window on the ringers' floor in the tower, which was fast crumbling away, has been replaced by a new one. The exterior pointing and interior plastering have been executed by Mr. A. Airey, of Blackburn; the ornamental tiling, by Messrs. J. Dyson & Son, of Blackburn; the joiner's work, by Mr. Blackledge, of Brindle; and the interior decorating, by Mr. Bennett, of Manchester. The whole of the work has been executed under the personal supervision of Mr. Bertwistle. This interesting old country church now presents a greatly improved appearance, both externally and internally.

**Sunderland.**—A Presbyterian church is to be built in Stockton Road. The committee, who have visited several of the most recently erected Presbyterian churches in the kingdom, selected Mr. John B. Wilson, A.R.I.B.A., Glasgow, for their architect. The church will be somewhat similar in arrangement to the recently completed Crescent Presbyterian Church in Belfast, also designed by Mr. Wilson, and the buildings will comprise a church of 1,000 sittings, church hall for 750, lesser halls for 330 and 120 sitters, classrooms, session-

room, vestry, ladies' meeting-room, kitchen, &c., and also a large and well-equipped gymnasium. The style of the buildings will be Gothic of the thirteenth century period, and a principal feature will be a massive bell tower rising to a height of 140 feet.

**Troon, N.B.**—The foundation-stone of the proposed U.P. church has been laid. The building is designed in the Decorated style, and will comprise nave, with side aisles and choir, with tower and spire, vestry, ladies' room, and hall for 120 persons. Sittings will be provided in the church for 660 persons. Mr. John B. Wilson, A.R.I.B.A., Glasgow, whose design was selected in competition, is the architect. The contractors are:—Orr, McLean & Co., masons; James Ralley, wright; D. Walker, plumber and gasfitter; A. McSkimming & Son, plasterers; A. & H. Gilchrist, painters and glaziers—all of Troon; W. Darrie, Glasgow, slater.

### NEW BUILDINGS.

**Olton.**—Mr. James Kent, of Birmingham, the owner of an estate of about one hundred acres at Olton, some six miles from that town, has now completed the first block of villa residences erected on the estate, and purposes to erect sixty-seven similar residences, and form several new roads. Each of these houses will consist of drawing and dining-rooms, kitchen, pantries, scullery, outbuildings, wine and ale cellars, and four spacious bedrooms. At Sparkhill (about two miles from Olton) the architect has prepared plans for fifty villas, which are progressing rapidly. These houses are somewhat similar in arrangement to the above. The design of the whole of the buildings is Gothic in character, ornamental brickwork, terracotta, stonework, Minton's tiles, ornamental woodwork, &c., being introduced. The total cost will be about 25,000*l.* The architect is Mr. J. Statham Davis, of 53 Newhall Street, Birmingham.

### GENERAL.

**The Queen** has consented to lend *Chantrey's Studio*, by Sir Edwin Landseer, for the autumn exhibition in the Wolverhampton Art Gallery.

**Mr. W. J. Bishop**, who was art master in the Liverpool College for forty-three years, died on Monday in his eighty-third year. He was president of the local Academy of Fine Arts for nearly as long a period.

**The Gambetta Memorial** in Paris, of which M. Boileau is the architect and M. Aube the sculptor, will be unveiled on Friday next. It stands near the roadway across the courtyard of the Louvre, and opposite the Arc de Carrousel.

**M. Crauk** is now erecting his group of sculpture in the pediment of the new Luxembourg Museum. The subject is "Glory distributing rewards to the Plastic Arts."

**M. Carnot** has resolved to use the palace of Fontainebleau, and the French Chambers will have to vote 6,000 francs to put the rooms in order.

**The Chester Archaeological Society** will issue a volume containing reports of the discussions on the origin of the walls of Chester, which by some authorities are supposed to be Roman work.

**Mr. T. C. Coulthurst**, who was borough surveyor of Derby since 1879, has died in St. Thomas's Hospital of general paralysis. He was formerly an architect in Barrow-in-Furness, and the first Board school in Derby was erected from his designs.

**A Subsidence** occurred on Cradley Heath, near Birmingham, on Sunday and Monday, causing damage amounting to 14,000*l.* The Methodist chapel has sunk 2 feet, and is much damaged in consequence.

**The Worcestershire County Magistrates** on Monday approved of a report of the police committee recommending the purchase of a site at Clent for the erection of a police station, plans for the same, with estimate of cost, to be prepared by the county surveyor.

**The Building Trade** in Leicester was, at the quarterly meeting of the Town Council, stated to be in a healthy condition, the number of plans passed during the quarter exceeding by 113 the number in the previous quarter, and by 55 the number in the corresponding quarter of last year.

**Mr. Ernest Rüntz**, architect and surveyor, has gained the silver medal for fine art and the first prize for drawing, at University College.

**The Dunfermline Parochial Authorities** on Tuesday decided to purchase the McLean Hospital, to be used as an adjunct to the Poorhouse, which is at present too small, and to unite with the Burgh authorities of Dunfermline in erecting a permanent hospital for the treatment of infectious diseases.

CRIMINAL PROCEEDINGS, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



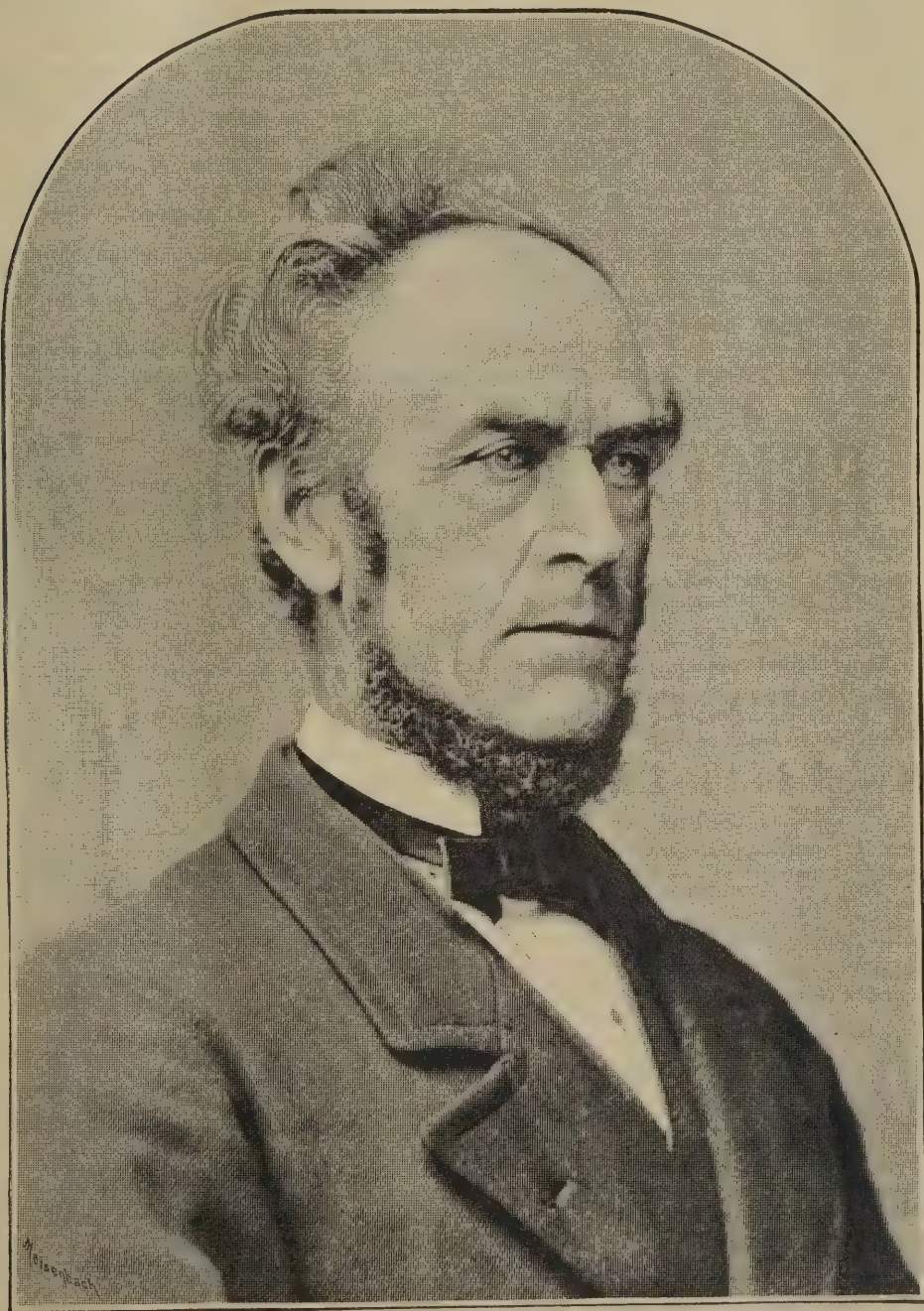
A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, JULY 6, 1888.

GREAT CONTRACTORS.—No. 13.



MR. JOHN MACKAY.



**MR. JOHN MACKAY.**

THERE are few contractors who can boast of having been actively engaged in the construction of public works for a longer period than Mr. John Mackay. Yet he has not reached his seventieth year. He was born in 1822, in the parish of Nogart, Sutherlandshire, and, after passing through the curriculum of the parish school, and gaining a sound knowledge of Latin, Greek and mathematics, he wisely entered the service of the late Thomas Brassey in 1843. He remained with Mr. Brassey until the death of that famed contractor, when he commenced business on his own account. As Mr. Brassey's representative Mr. Mackay was implicitly trusted by his chief, and it is calculated that, during the period of his agency, Mr. Mackay constructed on an average thirteen miles of railway every year. At one time he had as many as nine different contracts in the Midlands, all going on simultaneously. "My dear John" was Mr. Brassey's right-hand man in the Midland Counties, and is favourably noticed by Sir Arthur Helps in his "Life of Thomas Brassey."

Mr. Mackay has carried out several large contracts on his own account both at home and abroad. Amongst these may be mentioned the Dowlais Tunnel, the Swansea and Clydach Railway, the Cardiff and Ogmore and Llynvi Branches, the Princetown Branch, the Southsea Branch, the Treforest section of the Barry Dock and Railways, and many others. Abroad his name will be honourably associated with the Waterworks of Port Elizabeth and King Williamstown, South Africa, and the Government railways of Jamaica.

No man has a better idea of the value of work and, when tendering this year for the third section of the Thirlmere Waterworks, there was only a difference of 175% between Mr. Mackay's tender and that of the present contractors for the second section, out of an amount of over 100,000%. Mr. Mackay is a great friend of the crofters, and gave valuable evidence for them before the Royal Commission. He is held in such esteem in his native country that at the last election three seats in Parliament were offered him, and, had he stood, there is no doubt he would have been returned at the top of the poll. Mr. Mackay largely assisted Professor Blackie, with pen and purse, in the establishing of the Celtic Chair in the University of Edinburgh, and the debt of Scotsmen to our

contractor was acknowledged by the enthusiastic Professor in the following sonnet:—

Who love the Highlands? Not with murderous guns,  
Who scour the moor, and chase the flying deer;  
Who lure the speckled troutling from the mere;  
And hook the strong-nosed salmon, where he runs  
Cleaving the adverse flood. These love their sport;  
But thou, Mackay, dost love the stout-thewed men,  
Whose sweatful toil redeemed the stony glen,  
And filled wide Europe with the proud report  
Of their high daring deeds; and thou didst stir  
In fresh young hearts brave memory of their sires;  
And mothers hailed in thee God's minister,  
To fan the slumbering flame of patriot fires.  
Who loveth thus loves well, and nobly wise,  
Weds earth to heaven with worth that never dies.

**CONTRACTS OPEN.**

ASHTON.—July 12.—For Building Baptist Chapel. Mr. T. P. Worthington, Architect, South Shore, Blackpool.

AUDENSHAW.—For Building Vicarage for St. Stephen's Church. Mr. J. H. Burton, Architect, Warrington Street, Ashton-under-Lyne.

BELFAST.—July 9.—For Building School, North Queen Street. Mr. S. Hunter, Waring Street, Belfast.

BELFAST.—July 7.—For Building Residence at Holywood. Mr. T. McJohnston, Architect, 28 Waring Street, Belfast.

BURNLEY.—For Building Five Dwelling Houses. Mr. H. Smith, Architect, 3 Yorke Street, Burnley.

CUPAR, FIFE.—July 9.—For Enlargement of District Asylum. Messrs. Kinnear & Peddie, Architects, 3 South Charlotte Street, Edinburgh.

EAST ARDSLEY.—July 14.—For Building Mission Church. Mr. W. S. Barber, Architect, 9 George Street, Halifax.

FULWOOD.—July 11.—For Building Engine-sheds for the Local Board. Mr. T. Harrison Myres, 15 Chapel Street, Preston.

GREENWICH.—July 19.—For Building Pavilion and Additions to Union Infirmary. Mr. Thomas Dinwiddy, Architect, 12 Crooms Hill, Greenwich.

HALIFAX.—July 16.—For Building Shop. Mr. James Farrar, Architect, 29 Northgate, Halifax.

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PONTARDAWE.—July 9.—For Building Baptist Chapel. Mr. G. T. Evans, Solicitor, Pontardawe.

PONTYPRIDD.—July 17.—For Rebuilding Tower of Eglwysilan Church. Mr. Vaughan, Architect, Cardiff.

RADCLIFFE.—July 9.—For Building Six Houses. Messrs. Sellers & Hamilton, Architects, Union Chambers, Bury.

RAMSBOTTOM.—For Additions to St. Joseph's Schools. Mr. C. W. Whittenburg, Architect, 74 King Street, Manchester.

SALFORD.—July 12.—For Building Stable, Engine-house, &c. Messrs. Darbyshire & Smith, Architects, 17 Brasenose Street, Manchester.

SHOTLEY BRIDGE.—July 13.—For Building Two Houses for the Co-operative Corn Mill Society. Messrs. John Smith & Son, Architects, Rose Cottage, Shotley Bridge.

SOUTHWICK.—July 12.—For Building St. Columba's Church. Mr. G. D. Irwin, Surveyor, Baltic Chambers, Sunderland.

## TENDERS.

## AUGHNACLOY.

For Nave and Porches, Repewing and other Improvements, to Aughnacloy Presbyterian Church. Mr. JOHN BOYD, Architect, 7 Clarence Place, Belfast.

T. Collen & Son, Armagh	£1,891	3	8
A. Wheelan, Newry	1,190	0	0
J. Small, Ballyroney	1,180	0	0
Bright Bros., Portadown	1,085	0	0
COLLEN BROS., Portadown (accepted)	1,050	0	0
J. Reid, Pomeroy	985	0	0

## BURTON-ON-TRENT

For Alteration and Extension of Boys' School, Grange Street, for the Burton-on-Trent School Board. Mr. REGINALD CHURCHILL, Architect, Burton-on-Trent. Quantities by the Architect.

Walker & Slater, Derby	£440	0	0
Maddocks, Burton-on-Trent	435	0	0
Hodges, Burton-on-Trent	418	0	0
Varlow, Burton-on-Trent	414	0	0
Mellors, Burton-on-Trent	409	0	0
Wigley, Burton-on-Trent	392	15	0
Mason, Burton-on-Trent	392	0	0
WILEMAN, Burton-on-Trent (accepted)	388	0	0

## BRIDLINGTON QUAY.

For Detached Villa, West Side, Victoria Road, for Mr. J. V. Kensley. Mr. J. EARNSHAW, M.S.A., Architect, Carlton House, Wellington Road, Bridlington Quay.

Clark	£620	0	0
Rennard	579	18	10
Bailey	473	0	0
Hudson	465	0	0
Gray	454	0	0
OWSTON (accepted)	434	0	0

For Pair of Villas on the Victoria Road Estate, for Mr. J. F. Scholefield's Exors. Mr. J. EARNSHAW, Architect.

Owston	£1,025	0	0
Bailey	1,000	0	0
Hudson	995	0	0
Rennard	925	0	0
MAINPRIZE (accepted)	840	0	0

## BASINGSTOKE.

For Construction of Reservoir, for the Basingstoke Urban Sanitary Authority.

Sims, Basingstoke	£634	0	0
Tarrant, Basingstoke	576	0	0
Chamberlain, Arundel	560	0	0
Roe & Co., Southampton	530	0	0
Lean, Newport	500	0	0
Pike Bros., Basingstoke	468	0	0
Harris, Basingstoke	436	12	0
Mussellwhite, Basingstoke	362	10	0

## DERBY.

For Building Infants' School at St. Dunstan's, Derby. Messrs. NAYLOR & SALE, Architects, Derby. Quantities by the Architects.

A. W. Spencer, Derby	£1,565	10	0
F. Slater, Derby	1,390	0	0
J. Parker, Derby	1,376	0	0
W. Eaton, Derby	1,375	0	0
W. Walkerdine, Derby	1,350	0	0
A. Smith, Derby	1,330	0	0
J. Hilton, Derby	1,325	0	0
T. Kelham, Derby	1,317	0	0
G. Pemberton, Derby	1,270	0	0
R. Weston, Derby	1,263	0	0
H. VERNON, Franchise Street, Derby (accepted conditionally)	1,140	4	0

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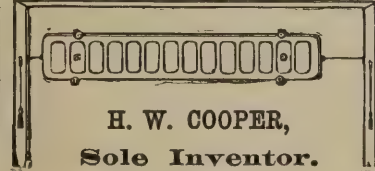
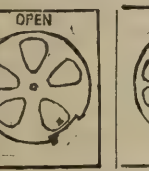
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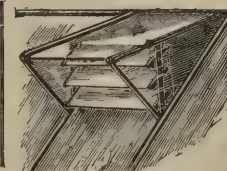


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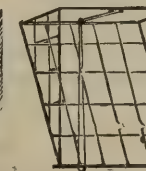


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For Building Manager's House and Pair of Cottages, for the Grays Paper Works. Mr. G. M. LAWFORD, Architect, 7 Westminster Chambers, S.W.

W. Johnson, Wandsworth . . . . .	£795	0	0
A. Brickell, Kensington . . . . .	650	0	0
Kirk Bros., Battersea . . . . .	598	0	0
J. Thompson & Son, Grays . . . . .	596	15	0
J. Brown, Grays . . . . .	550	0	0
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## GREAT HALE.

For Taking Down Farmhouse and other Buildings, and Erecting Farmhouse, Great Hale, Heckington. Mr. J. R. BENSTEAD, Architect, Sleaford. Quantities not supplied.

Spink, Heckington . . . . .	£581	0	0
Clark, Boston . . . . .	549	5	8
Parker & Hinds, Boston . . . . .	540	0	0
Batsman, Sutton Bridge . . . . .	477	14	0
Smith, Culverthorpe . . . . .	468	10	0
Greenfield, Boston . . . . .	456	15	0
Banks & Peake, Sleaford . . . . .	455	0	0
Leafe, Boston . . . . .	441	0	0
HOCKLEY, Grantham ( <i>accepted</i> ) . . . . .	439	0	0
S. & R. Horton, Lincoln . . . . .	350	0	0

## HUDDERSFIELD.

For Building Store and Butcher's Shop for the Hillhouse Industrial Society, Limited, Huddersfield. Mr. J. BERRY, Architect, 9 Queen Street, Huddersfield.

*Accepted Tenders.*

Stead & Kaye, Viaduct Street, Huddersfield, excavator, mason and bricklayer.

Hampshire & Armitage, Northumberland Street, Huddersfield, carpenter and joiner.

W. E. Jowitt, John William Street, Huddersfield, slater.

Crossby, Boul & Marsden, Union Bank Yard, New Street, Huddersfield, plumber and glazier.

J. Robinson & Son, Marsh, Huddersfield, plasterer.

J. Lunn, High Street, Huddersfield, painter.

Total cost, £2,000.

## HORSHAM.

For Additions to Norfolk Cottage, Horsham. Messrs. E. & C. H. BURSTOW, Architects, Horsham and Horley.

Fannett Bros., Horsham . . . . .	£1,099	0	0
J. Potter, Horsham . . . . .	1,095	0	0
P. Peters, East Street, Horsham . . . . .	1,017	0	0
Rowland Bros., 37 Park Street, Horsham . . . . .	950	0	0
John Brown, England's Oak, Horley . . . . .	932	0	0
G. SHARP, Horsham ( <i>accepted</i> ) . . . . .	885	0	0

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J. O. Jewsbury, Leicester . . . . .	5,695	5	7
G. Longden & Son, Sheffield . . . . .	5,432	17	0
J. Biggs, Birmingham . . . . .	5,431	11	11
E. Tempest, Leicester . . . . .	5,300	0	0
J. Dickson, Leicester . . . . .	5,000	0	0
Holme & King, Liverpool . . . . .	4,999	12	11
B. W. Ward, Whetstone . . . . .	4,772	19	6
S. & E. BENTLEY, Leicester ( <i>accepted</i> ) . . . . .	4,404	16	9
J. Evans, Birmingham ( <i>withdrawn</i> ) . . . . .	3,822	18	3

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Bryan W. Ward, Whetstone . . . . .	4,799	4	4
Samuel Jowett, Liverpool . . . . .	4,478	18	11
Enoch Tempest, Leicester . . . . .	3,978	10	3
Jacob Biggs, Birmingham . . . . .	3,972	0	0
Frank Eyre, Sheffield . . . . .	3,938	8	0
John McKay, Stoke-on-Trent . . . . .	3,758	10	5
James Dickson, St. Albans . . . . .	3,466	18	8
S. & E. Bentley, Leicester . . . . .	3,324	19	3
George Law, Kidderminster . . . . .	3,184	1	1
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Woodward	£5,457	0 0
Adamson	5,300	0 0
Nightingale	5,079	0 0
Lawrence	5,078	0 0
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Avis	4,785	0 0
W. Johnson	4,755	0 0
Cox	4,687	0 0
Hunt	4,510	0 0

For Alterations and Additions to the Conservative Club, Hanover Park, Peckham, for the Executive Committee. Messrs. H. H. LEONARD & CLARKE, Surveyors.

	General Work.	Roof and Hall.
Goat	£1,495	£143
Morter	1,490	96
Greenwood	1,425	94
Smith	1,377	120
Green & Lea	1,335	137
Parker	1,320	125
Holloway	1,315	140
Cox	1,290	120
Nightingale	1,240	100

For Building Cripples' Home, Marylebone Road. Messrs. HABERSHON & FAWCKNER, Architects, 38 Bloomsbury Square.

Lawrance & Co.	£8,690	0 0
Holland & Hannen	8,615	0 0
Gregar	8,376	0 0
Patman & Fotheringham	8,363	0 0
Bentley	8,256	0 0
Maides & Harper	8,097	0 0
Jones & Co.	7,892	0 0
Gregory & Co.	7,777	0 0

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## LONDON—continued.

For Enlargement of Board School, Brackenbury Road, Hammersmith, by 400 places. Mr. T. J. BAILEY, Architect.		
F. R. Tozer	£5,308	0 0
T. Bendon	4,542	0 0
G. Lyford	4,498	0 0
S. J. Jerrard	4,277	0 0
H. Hart	4,215	0 0
W. Johnson	4,200	0 0
Stimpson & Co.	4,170	0 0
H. L. Holloway	4,080	0 0
A. R. Flew & Co.	3,700	0 0

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Carman, Richmond	£1,316	0 0
Higgs, London	1,283	0 0
Bishop & Tribe, Putney	1,270	0 0
Hunt, Barnes	1,240	0 0
Hickinbotham, Teddington	1,230	0 0
Judd, Kingston	1,117	0 0

For Erection of Proposed New Vicarage House at St. Michael's at Stockwell. Mr. EWAN CHRISTIAN, Architect.

	House.	Fence Wall.
Roberts	£2,605	£27
Dove	2,375	31
Maxwell	2,145	18
Tyerman	2,127	10
Brass	2,073	25
Holloway	2,073	20
Marsland	2,065	25
Nightingale	2,040	17
T. & H. Higgs	2,030	23
Charteris	2,018	17

For Erection of Proposed Mission House, for St. Michael's, Camden Town. Mr. LACY W. RIDGE, Architect.

Drew	£1,670	0 0
Nightingale	1,583	0 0
Pattinson	1,576	0 0
Williams	1,573	0 0
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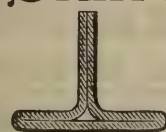
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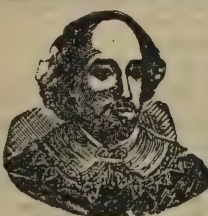


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For Enlargement, &amp;c., of Board School, Horseferry Road. Mr. T. J. BAILEY, Architect.

J. Holloway	£2,900	0	0
W. Downs	2,892	0	0
D. Charteris	2,874	0	0
W. Oldrey & Co.	2,836	0	0
W. Johnson	2,803	0	0
H. L. Holloway	2,725	0	0
Stimpson & Co.	2,630	0	0

For Enlargement of Infants' Department, Wellington Street School, Hoxton, by 44 places. Mr. T. J. BAILEY, Architect.

G. R. Earsdon	£540	0	0
F. & F. J. Wood	335	0	0

For Enlargement of Board School, Randall Place, Greenwich, by 120 places. Mr. T. J. BAILEY, Architect.

Stimpson & Co.	£1,400	0	0
W. Johnson	1,386	0	0
H. L. Holloway	1,360	0	0

## For Works to Board Schools.

## Vittoria Place.

J. Grover & Son	£69	0	0
E. Green	60	7	6
C. Dearing & Son	60	0	0
Williams & Son	51	10	0
T. McCormick & Sons	48	18	0
Kirby & Chase	36	0	0

## Wenlock Road, Hackney.

J. Grover & Son	132	0	0
Pritchard & Son	117	0	0
T. McCormick & Sons	98	0	0
C. Dearing & Son	90	0	0

## Waterloo Road.

G. R. Earsdon	364	0	0
W. Downs	330	0	0
Davis Bros.	318	0	0
T. Bendon	314	12	0
H. L. Holloway	298	0	0
J. W. Roy	297	0	0

(Less 4% ios. credit for old materials.)

## Hunter Street, Southwark.

G. R. Earsdon	£315	0	0
T. Bendon	291	10	0
H. L. Holloway	284	0	0
J. W. Roy	283	0	0
T. Linfield	282	0	0
J. Bullers	273	0	0
Hollingsworth	263	0	0
M. McCarthy	260	0	0
Davis Bros.	257	0	0
King Bros. & Co.	253	0	0

## Broad Street.

G. R. Earsdon	180	0	0
T. Bendon	130	0	0
F. & F. J. Wood	124	0	0

## Collingwood Street.

T. Bendon	517	0	0
G. R. Earsdon	505	0	0
F. & F. J. Wood	487	0	0

## Monteith Road.

Davis Bros.	18	10	0
W. Pratt	13	5	0
E. H. Sarjeant	10	10	0
N. Richards	7	15	0

## LONDON—continued.

For Rebuilding the Fountain Public-house, New Street, Broad Street, Golden Square, for Messrs. J. Huggins &amp; Co. Mr. WM. WEST, Architect and Surveyor.

	Rebuilding.	New Party Wall.
Brass	£2,564	£142
Nightingale	2,533	150
Patrick	2,470	140
Hall, Beddall & Co.	2,387	155
Peto	2,279	140

For Alterations and Repairs to Premises at rear of Nos. 37 to 41 Lower Marsh, Lambeth, and in Robert Street adjoining, for the Executors of the late Mr. E. Grove. Messrs. FORD &amp; HESKETH, Architects. Messrs. Karslake &amp; Mortimer, Surveyors.

Scutt	£1,100	0	0
Nightingale	881	0	0
Lawrence	841	0	0
Marsland	832	10	0
Lathey	795	4	0
Mills	789	0	0

## NEW BROMPTON.

For Building Baptist Chapel and Schoolroom, New Brompton. Mr. JOHN WILLS, Architect, Derby.

Higgs	£4,073	0	0
Wiltshire	3,749	0	0
Skinner	3,634	0	0
Edser & Bockham	3,459	0	0
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NAYLAR & SONS (accepted)	3,298	0	0

## NOTTINGHAM.

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For Alterations, Tavistock Chambers, Nottingham. Mr. ROB. C. CLARKE, Architect, Nottingham.

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For Building Two Factories, Engine and Boiler House, and Stabling, at Sandiacre, near Derby. Mr. ROB. C. CLARKE, Architect, Nottingham.  
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## STRATTON ST. MARGARET.

For Erection of Three Cottages at Stratton St. Margaret, Wilts. Mr. WILLIAM DREW, M.S.A., Architect, Queen Victoria Street, Swindon.  
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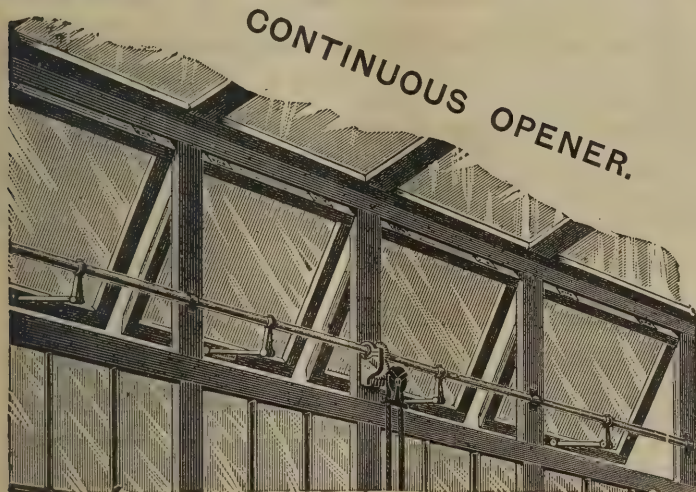
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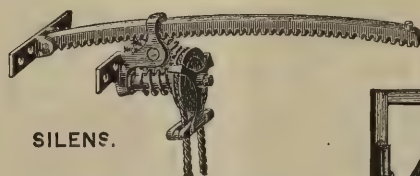
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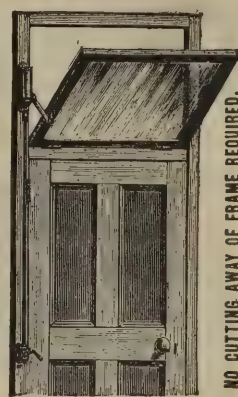
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## SUFFOLK.

For Heating Hawkedon Church, Suffolk.  
JOHN GRUNDY, London and Tyldesley (*accepted*).

## WHITWICK.

For Building Whitwick Liberal Club. Mr. HENRY HEWES,  
jun., Architect, Coalville, Leicester.

E. Briers	£603	0	0
Needham (too late)	533	10	0
W. Moss	515	0	0
Beckworth & Son	512	0	0
BLOOD BROS. ( <i>accepted</i> )	483	7	6

## YORKSHIRE.

For Heating Borobridge Mansion, Yorkshire. Mr. J. MONK-  
MAN, Architect, York.  
JOHN GRUNDY, 30 Duncan Terrace, City Road, London, and  
Tyldesley (*accepted*).

## TRADE NOTES.

IN the notice of the opening of St. Patrick's Church, Widnes, erected from the designs of Messrs. J. & B. Sinnott, Liverpool, it was omitted to mention that the floors have been laid with Mr. Roger L. Lowe's (Farnworth) patent system of wood-block flooring.

THE swimming-baths at Hampstead, recently erected from the designs of Messrs. Spaulding & Auld, have been fitted throughout with lock and door furniture by Messrs. Edgar Keeling, Teale & Co., art metalworkers and ironmongers; the locks (over 200) for the dressing boxes and private baths were specially designed and made for this job. The whole of the gas-fittings, which are of a most suitable and substantial character, were also manufactured by Messrs. Keeling, Teale & Co.

TENDERS are being sought for a proposed new school in connection with the Independent Methodist Chapel, Lee Lane, Horwich. The designs are by Mr. T. E. Smith, architect, of Bolton.

THE new Sanatorium, Eastbourne, is being warmed and ventilated throughout by means of Shorland's patent Manchester grates and Manchester stoves, supplied by Mr. E. H. Shorland, of Manchester and London.

THE Peterhead red granite and Aberdeen grey granite form a considerable item in the construction of the memorial clock tower at Brighton, and was supplied by Messrs. J. Whitehead & Sons, of the Granite Works, Aberdeen.

## A JUBILEE FOUNTAIN.

LAST year Sir William Marling, of Stanley Park, near Stroud, commissioned Messrs. Boulton & Sons, architectural sculptors, of Cheltenham and Kensington, to execute an ornamental fountain for the garden terrace in front of his drawing-room. The fountain has only just been completed and fixed up, in consequence of the difficulty to obtain a stone large enough for the centre bowl. The fountain is about 20 feet high and 15 feet diameter at the base; the whole is quatrefoil and square on plan, being richly moulded with carved capitals, foliage, lions' heads, arms, crests, mottoes, &c., and four richly-moulded and carved vases for flowers round the lower basin, the jets of water being arranged in a most artistic manner, and producing a very beautiful effect. The work has been carried out from the designs and under the instructions of the architect, Mr. J. P. Moore, of Gloucester, in a most satisfactory manner by the Messrs. Boulton; and also under the supervision of Sir William Marling, who has taken much interest in its details. The water supply to the mansion and fountain was also arranged by Mr. Moore, who made the plans of considerable alterations to Sir William's mansions both at Stanley and Ledbury Parks.

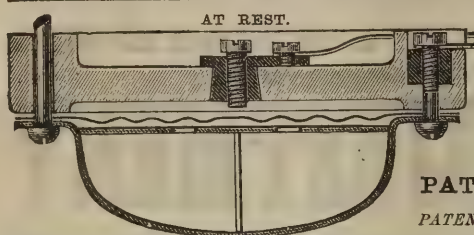
## DUBLIN CITY ARCHITECT.

At the meeting of the Dublin Corporation on Monday the re-election of Mr. Freeman, as city architect, was proposed by Sir G. Owens, and seconded by Mr. Toole.

Mr. Cummins moved as an amendment that the election be postponed pending a report ordered by the Council on April 27 being furnished by the city architect on the state of the baths in Tara Street. Mr. Carroll seconded the amendment.

Mr. Dawson said that the architect was not altogether to blame with regard to those baths, as the committee had had a great deal to do with the matter.

Alderman O'Leary said that until he got some information as to why the ratepayers were to lose 1,000*l.* a year by the

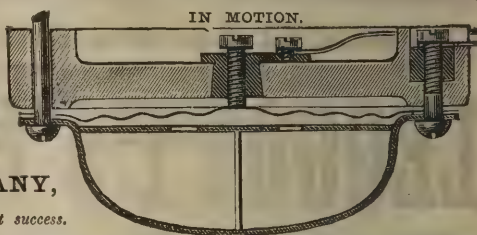


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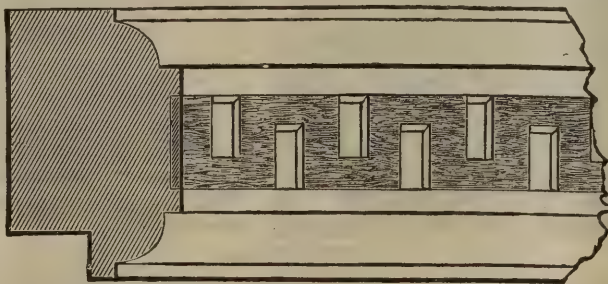
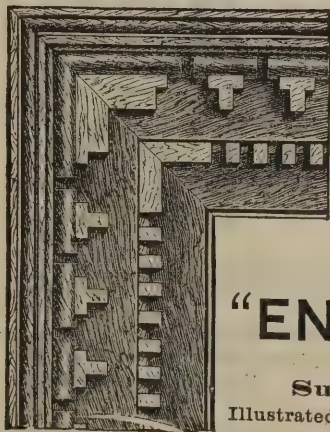
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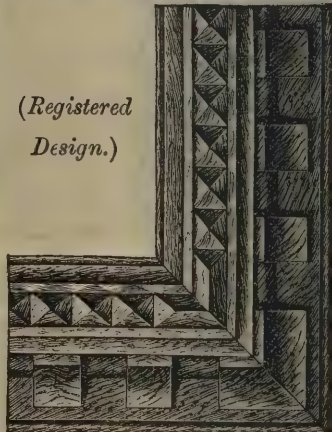
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Barrack Street Labourers' Dwellings, he should oppose the re-election of Mr. Freeman.

The Town Clerk said that if the amendment were passed, there would be no city architect after to-morrow.

Mr. Cummins said he would alter his amendment to the effect that Mr. Freeman be elected for only one month, pending the presentation of the report ordered.

After some discussion, the amendment was put, and declared lost by a majority of 27 to 12.

A further amendment was moved by Mr. Pile to the effect that the election be postponed, and that a committee of the whole house be summoned to deal with the whole matter. Mr. Bonass seconded the amendment, which, after some discussion, was altered as follows:—"That Mr. Freeman be elected to the office for three months, and that all matters in reference to the works carried out by him be referred to a committee of the whole house for report on same." There were 17 for and 19 against. The amendment was therefore lost, and the original motion was adopted. After some discussion, Messrs. Walsh and Butler were re-elected building surveyors.

#### IMPROVEMENT OF THE LIVERPOOL DOCKS.

THE dimensions of shipping having been vastly increased since some of the Liverpool docks were constructed, the problem of finding accommodation for the vessels daily grows more difficult, especially when economy must be considered. Mr. G. F. Lyston, the engineer of the Dock Board, has devised a plan of pumping on a large scale, which it is anticipated will be effective. Indeed, in the Sandon Dock pumping has already been tried with unqualified success. Out of that dock, which has an area of about ten acres, there run six graving docks, all more or less obsolete on account of their shallowness. The difference in depth between the sills of the graving dock and the sills of the wet dock is, on the average, five feet. To have deepened them to that extent would not only have involved great cost, but it would have rendered them far less convenient in form and harder to pump dry. The alternative was to raise the level of water in the wet dock, so that when it became necessary to place a vessel in one of the graving docks she would have a sufficient depth of water to enter. This was done by means of pumping apparatus. The Dock Board erected at the Sandon Dock four centrifugal pumps, each of 36-inch

diameter suction, and these, pumping 22,000 gallons a minute a-piece, raise the water in the Sandon Dock 5 feet in the course of an hour and a half. This scheme was undertaken, in a measure, experimentally.

The south docks which it is now proposed to treat in the same way—that is to say, the Wapping Basin, Wapping, King's, Queen's, Coburg, and Brunswick Docks, and Queen's Dock Basin—have an area of 36 acres, and the idea is to supply them with water during neap tides to such an extent that, notwithstanding leakage, lockage, and the use of the half-tide docks, there will be retained a minimum depth of 22 feet. This is the mean depth at high water, for it must be remembered that the depth in the docks during spring and neap tides varies to the extent of 11 feet. The only entrance to and exit from these docks for large vessels will then be the deep-water approach already described as existing at the Herculanum entrances. The Herculanum has been constructed with two sets of gates, and between the new and older south docks there is now being completed a connecting dock or lock 500 feet in length and 120 feet in width, through which ships can be passed. The pumping will raise the water in the Brunswick and the others of the older docks several feet above the level in the new docks to the south, and vessels using the older docks will have to be collected at the docks an hour or two hours before high water, and to pass through so as to get into the river as soon as possible after the entrances of the Herculanum have been opened. Vessels of light draught, which do not require to take advantage of the extra depth, will still use the Queen's Half-tide, the Coburg, and the Brunswick Half-tide as direct exits to the river. Special arrangements have been made as to the traffic in the Coburg. An hour and a half before high-water it will be allowed to run down; at high water the gates will be closed and the pumps started.

To carry out the plan thus outlined there are being erected on the west pier-head of the Coburg Dock three large centrifugal pumps, with compound condensing engines and the necessary boiler-power. Each pump has a suction 54 inches in diameter, and will be capable of delivering 57,000 gallons per minute. Together they will pump 15½ million gallons through an average lift of 43 inches in 90 minutes. The pumps are expected to be in working at the end of the year, and by greatly increasing the capacity of a series of important docks will obviate great existing inconveniences. Should this system prove as easy in practice as it looks feasible in theory it will probably be extended to other docks at the north end, notably

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to the Huskisson Dock, which, although a fine work, has become too shallow for the present class of vessels, also possibly to Birkenhead, where, under existing conditions, a want of sufficient water on neap tides is frequently experienced. If the docks mentioned above are used by larger vessels improvements in shed accommodation and quay space for storage must follow as a necessity, and these are in contemplation. The great advantage of this method is that not only does it avoid a great outlay for purposes of reconstruction, but it prevents the great loss of revenue which the closing of a dock for any length of time involves.

### THE SUPPORTING POWER OF SOILS.

BY RANDELL HUNT.

It is often necessary for the engineer to prescribe a limit of load per unit of surface in designing foundations for structures resting upon soil. In the absence of the time and means to make actual tests of the soil, he must confine himself to an investigation of existing successful structures upon a soil as nearly similar to the one under consideration as he can find. It is the object of this paper, then, to present a few remarks upon the actual supporting power of soils as deduced from an investigation of the matter from our own observations, and the recorded examples which have been accessible. It is probably possible to devise a general mathematical formula which would be applicable to the supporting power of any soil, but such an expression would necessitate our knowing so many particulars as to the character of the soil, such as its weight and natural slope, that we could judge of its actual strength fully as well without applying it. At any rate, we shall confine ourselves simply to the practical side of the matter.

*The Supporting Power of Clay.*—The supporting power of clay is very variable and depends in a large measure upon the variety, and upon its degree of saturation with moisture. In the roadbeds of railroads, when the "surfacing" has been done with clay, a smooth, hard bed, unyielding and with far greater supporting power than would be required is always found in dry weather. It becomes very compact, so much so that it is impossible to press the point of a walking-cane into it. But after a drenching rain all conditions change, and the roadbed becomes a mass of mud, into which the ties are pressed down and the clay bulges up between them. We mention this simple example of dry and wet clay because it is familiar to most of

us, and shows clearly the effect of too much moisture in such soil.

The clays vary considerably, however, in their chemical constituents, and are affected thereby in the degree to which they absorb moisture. Certain deposits are known to be compact and hard, with a high supporting power, while others are in the condition of a plastic material easily compressed. But its chief characteristic which renders all clay more or less unstable, when regarded in the light of a foundation, is its known property of retaining water once admitted to it and its softening propensities, which gradually take place as the amount of water increases.

The stiff blue clay deposits of London are celebrated as much for the numerous failures of the bridges and other structures founded on it as for any other reason. Old Westminster Bridge had probably about  $5\frac{1}{2}$  tons per square foot of foundation, and failed. Blackfriars Bridge had about 5 tons, and appeared to be stable for many years, but ultimately settled very badly. New London Bridge was built in 1831, and founded upon piles, upon which as much as 80 tons per pile was imposed. Of course it has settled, in some places as much as a foot. The pressure per square foot of the entire foundation of this bridge is 5 tons. When the new Westminster Bridge was built, the load per pile was reduced to about 12 tons, while the load per square foot of the entire foundation was reduced to 2 tons. I find no record of this bridge having shown any sign of settlement.

Robert Stephenson attempted to load a stiff, hard clay with 5 tons per square foot. He was building some high bridge piers at the time, but before they were completed serious settlements took place, and he decreased the amount per foot by making his foundation of greater area than first determined upon. He also built a large chimney, which failed, and then constructed another at Newcastle-on-Tyne, with only  $1\frac{1}{2}$  tons per square foot of foundation, which was successful. Both these chimneys are described as being founded on hard compact clay.

The subsoil of the vast valley of the Red River, North America, is a bed of clay, which varies in depth from 80 to 125 feet, a bed of sand and gravel usually being found underlying it. This clay is generally of a yellowish colour, and appears more or less hard and firm in proportion to the amount of moisture contained in it. Chemically considered, it has a large amount of carbonate of lime in it, as can be seen from its action when treated with acids, and when freshly opened up to view in a

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place where free from much moisture appears about of the consistency of marl.

In 1881, at Fargo, Dak., a brick building of four storeys in height, including a basement storey, was constructed upon a concrete foundation. The pressure per square foot upon the clay was at no place greater than  $2\frac{1}{2}$  tons, and was probably even less than this amount. The building showed a certain amount of settlement each season, until the third year after being built one side of it suddenly commenced to crack, and settled a foot or more in a single day, becoming so dangerous that the occupants were compelled to abandon it. The side which had failed was immediately torn down, a new foundation of broader dimension put in, and the wall reconstructed. The load per square foot on the clay of the new wall is about  $1\frac{1}{2}$  tons, and, as far as the author knows, it has remained intact. All along the side of the wall which failed was an open area-way which was very imperfectly drained, which we are inclined to think was the cause of the clay becoming softer than it otherwise would have been; for the other three sides of the building, while showing more or less settlement, yet remained comparatively in good condition.

In the city of Cleveland, Ohio, many heavy structures have been founded upon clay deposits, and one or two notable ones have shown serious settlements. In the new central viaduct, now being constructed, and the foundations of which were described in the *Journal of the Association of Engineering Societies*, the pressure per square foot of foundation on those piers and abutments which rest directly upon the clay has been limited to from 1 to  $1\frac{1}{2}$  tons. The abutments which exert the largest load mentioned are described as resting upon "a mixture of blue sand and clay, with some water," while the piers giving a load of but 1 ton per square foot rest upon a "plastic blue clay of various degrees of stiffness mixed with fine sand."

When clay is mixed with other materials, as coarse sand and gravel, its supporting power usually largely increases, being greater in proportion as the other materials are in excess, up to the point of forming a concrete mass, in which the clay is the cementing material, and in just sufficient quantity to bind the materials together. In this condition we often find the clay in an indurated state, and the hardness of the mixture—commonly called "hard pan"—is proverbial. Such soils are safe for heavy loads, approximating that of the softer rocks.

Brennick, in his book on foundations, mentions a large chimney, with a load of 6 tons per square foot on hard clay.

This is an extraordinary example, and we are inclined to think, though no further particulars are stated, that it was upon some such hard mixture of clay and gravel as mentioned. At any rate it would be a bad precedent to follow in loading beds of pure clay.

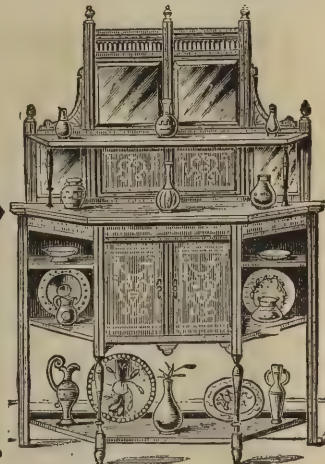
The Washington Monument is founded upon a layer of clay and sand. When the shaft was up 150 feet, an investigation showed that the foundation was entirely inadequate upon which to complete the structure, a committee of United States army engineers reporting that such a soil should never be loaded above 10,000 lbs. per square foot. The foundation was therefore made heavier and larger, and the shaft successfully completed with a height of 555 feet. Colonel Casey, the engineer in charge, reports the pressures upon the soil as nowhere exceeding 9 tons per square foot, and less than 3 tons per square foot near the outer edges. The settlement of the monument during the repairs to the old foundations was about 2 inches, and afterwards a further settlement gradually occurred during construction of 2 inches more, making a total of 4 inches. If the load per square foot on the soil reaches the amount of 9 tons, it is the heaviest load upon such a soil which we find any record of, and we think the doubts expressed by different persons as to the ultimate stability of the monument entitled to careful consideration.

*Supporting Power of Sand.*—Foundations on coarse sand and gravel are usually successful, particularly if free from the action of running water, and structures, proportioned in accordance with any ordinary rules of good construction, are hardly likely to have an area of base which will not be sufficient to limit the load per unit to the safe carrying capacity of the soil. Coarse sand deposited in beds has usually a high supporting power, but the coarseness alone is not proof positive of this, for it also depends somewhat upon how it has been deposited. On beds of sand made artificially, as is often done for foundations, the dry sand loosely thrown down does not form a compact mass, such as is desirable, and a certain amount of compressibility will exist. In some experiments made in France with river sand, it was found that by pounding the sand in thin layers, its density could be increased one-fifth, and that there still remained about 20 per cent. of voids which could be notably reduced by simultaneously treating the sand with water, while the stamping down took place. The compression was exercised in these experiments by means of hydraulic presses, and the results obtained showed that river sand treated as above would resist up to pressures of 1,420 lbs. per square inch. Water is



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the chief agent which makes the particles separate, and draws them into the voids of the mass, and is invaluable in all works of embankment in which solidity is required; but it must also be well drained off, because if the original amount should remain, of course the mass of earth would continue in a semi-fluid state.

Mr. Macdonald, in constructing the iron ocean pier at Coney Island, assumed that the safe load per square foot upon the flanges of the iron discs, which were sunk into the sand, was 5 tons. But many of them really support as much as 6.3 tons continually, and are subject to occasional loads of 8 tons per square foot, which they appear to sustain without settlement. The foundation of the large chimney of the New York Steam Company was made of concrete resting directly on the sand of the old beach, which had formerly extended to this point. This sand was quite fine, with pockets of gravel, and containing at a few places some stone. The sand was thoroughly saturated with water, and would flow when disturbed or undermined. The load per square foot on this material was to be 4 tons, but before more than one-third of this amount was placed upon it slight settlements occurred which were not uniform. After the structure was completed slight cracks appeared, but not sufficient to cause any material damage. In contrast with the loading of the partly unstable sand of this chimney, may be mentioned the loads which were imposed upon a clean, coarse sand in the foundations of the Pacific Mills chimney, at Lawrence, Mass. Here the sand was enclosed by tight sheet piling, and only 1.83 tons per square foot placed upon it. The anchorage of the Brooklyn Bridge rests upon sand, with a pressure of about 4 tons per square foot. The Nantes Bridge, constructed in 1863, and founded on sand, has a pressure of 6.78 tons per square foot, but has settled somewhat. The safe loading upon the sandy soil of Berlin is generally taken at about 2.3 tons. Brennick describes this sand as being comparatively loose, but likewise mentions its having been successfully loaded up to 4.1 tons per square foot.

When sand is mixed with other materials, such as clay or loam, which have the power of retaining water, its supporting power grows less, and proportionally more so as the sand becomes finer and loses its sharpness. Of such a nature is the commonly called "quick" sand, which really occupies a position between pure sand and pure clay, being a mixture of them both. Pure clay is composed of alumina, water, and silica, and in proportion as the silica is absent the more water will it hold. This is the material which, when mixed with the very fine and

rounded grains of sand, makes it "quick." Deposits of such are often found, which through long draining have lost all the water, and which appear dry and loose, and easy to excavate or handle, and generally of a whitish colour. If we could keep such deposits absolutely free from saturation with water, we could trust it with moderate loads. Its weight is less than either good sand or clay, running from 70 to 90 lbs. per cubic foot.

At the foundations of the Capitol at Albany, Mr. W. J. McAlpine describes some of the material as being quicksand without the water. Experiments made in the soil of this foundation showed that under a weight of 2 tons per foot no perceptible displacement occurred; and at about 5 tons the surrounding soil was forced upward. It was endeavoured to place no more than 2 tons per foot upon the soil with the completed building, and great pains were taken, by means of spreading gravel 6 inches deep over the whole area, and enclosing it in a puddled wall, to keep the character of the soil from changing. These foundations have partly failed, and serious cracks have appeared at different parts of the structure.

We find recorded by Debaue a case of founding upon a loose, watery sand, partaking somewhat of the nature of quicksand, in which the load per square foot was 1.8 tons. The sand is described as being of a syrupy consistency, and after endeavouring to excavate it without success, further than getting out about 3 feet in depth, they filled back into this partially excavated hole with dry, coarse sand, placed a bed of *béton* upon it, and completed the structure, which was a bridge over the canal of the Sambre à l'Oise, for the railroad from Busigny to Herson in France. No after settlement occurred. This method of treating quicksands with coarser sands and gravel appears to have been of much service in many cases. Trautwine records an example of its successful use in making a foundation over quicksand, for the brick aqueduct for supplying Boston with water.

*Supporting Power of Soft Soils.*—In speaking of soft soils we generally mean those which are referred to as being compressible, though really this is more or less of a misnomer, for they are regarded as being the more compressible in proportion to the amount of water they hold, and yet we know that water is practically incompressible. Debaue, in his excellent work on foundations makes this distinction clear, and classes such soils as *mobile*, movable, which in itself is a true definition of their characteristics. The alluvial mud of many rivers gives us the best examples of soils of this kind, and in this country, as in general in most others, the soft soils are usually found at

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the lower end of rivers flowing through valleys of considerable width, and emptying into the sea or large lakes, where the force of their currents is checked by the larger body of water, causing the detritus held in suspension to be deposited in beds of greater or less thickness, or by overflowing their banks and spreading far and wide throughout the valley, the waters lose sufficient velocity to carry the suspended matter further. An example of the greatest magnitude of such formation is seen in the country adjacent to the lower Mississippi, and much of the State of Louisiana has been formed in this way. Here is to be found the *prairie tremblante*—or trembling prairie—vast stretches of land composed of semi-fluid mud subsoil, overlaid by a mass of decayed vegetable matter, which, tied together by rootlets, forms a more solid, but trembling, crust. It is impossible, of course, to solidly found anything upon such soil, but rather must any such attempt be regarded as a problem of flotation in a muddy liquid. Yet we are often called upon to construct railroads, bridges, and buildings in soil but a trifle more solid and homogeneous. The supporting power of all soils is of course dependent more or less upon the depth at which the foundation is made, and in the alluvial soils such as we are now considering, this is of more importance than in other kinds. We have not time at our disposal in this paper to enter into this matter more fully, and in our remarks we have treated upon the supporting power of soils as we generally use them, and not much affected by depth.

The softer clays really belong to and should be treated in the same manner as the soft alluvial soils to which we are now alluding. The actual supporting power of such soils can hardly be given in figures which can be of much real value. In the city of New Orleans, for instance, almost without exception, we find recorded the serious settlement of all the larger buildings and structures, which have been founded directly upon the alluvial soil, and in many cases the load per square foot is much less than a ton. From some experiments made in India in alluvial soil, the safe load per square foot is given as 1 ton; while Sir Charles Fox finds it to be only 1,680 lbs. for the soil which he tested.

Experiments to determine the weight which can be safely placed upon soft soils have often been made, but are not generally of much value, unless the area of soil tested is of about the same extent as the base of the foundation to be placed upon it. This was very clearly shown in France some years since by a series of experiments made in the soft alluvial soil of the valleys of Vilane and l'Oust. A number of small

piers of masonry, 6.56 feet square, were built at different points, and made of such a height as to give a load per square centimètre double that of the large embankment which it was the intention to afterwards construct. It was supposed that these piers would settle deep into the mud, but they really settled a comparatively small amount, while the embankment, covering a great, broad area of base, but exerting a pressure per square centimètre of only one-half that of the piers, showed in all cases very much greater settlements.

The explanation was simple: if a small pier with a square base, pressed down into the soft soil, the frictional resistance against the sides of the compressed ground is proportional to the length of these sides, while a square pier of, say, double the width, would experience a frictional resistance just twice that of the first pier. In other words, this resistance is directly proportionate to the length of the perimeters of the bases. But the area of the base of the second pier is four times that of the first; hence we see that, with an equal pressure per square unit of base, a small pier would have much more resistance to overcome than a large one, and that one would be at fault to take as a correct measurement of the supporting power of the soil the results obtained from loading but a limited area.

Stated then as a proposition, the supporting power of soft soils is greater in proportion as the loaded area is limited, or conversely; large areas of soft soil will not support as much weight, per unit of surface, as more limited areas of the same soil. This principle is most important and should not be neglected by engineers designing foundations. It is applicable to the supporting power of bearing piles, and hence any formula for the same which does not make a distinction due to different sectional areas of the piles is incorrect in theory.

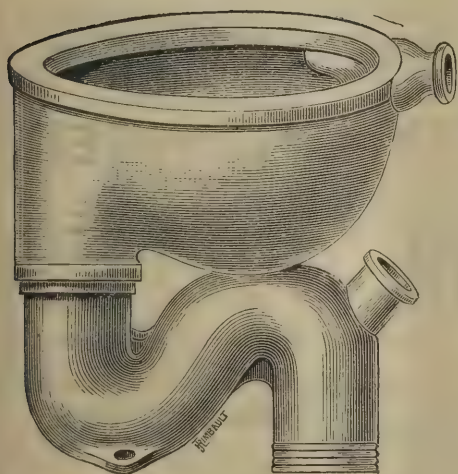
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## PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, Consulting Patent Agent, 43 Southamton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

## APPLICATIONS FOR PATENTS.

8782. William Fraser, for "Improvements for the better consuming of smoke and the better combustion of fuel." June 15, 1888.

8796. Gustave Charles Anthoni, for "A system of complete isolation of buildings and other constructions, machines, vehicles, and apparatuses of all kinds, with the object of deadening vibrations and shocks." June 15, 1888. (Complete specification.)

8825. Thomas Sandbrook, for "Improvements in valve seatings for cisterns." June 16, 1888.

8829. John Fraser Calder, for "Improvements in cisterns for water supply to water-closets and other appliances." June 16, 1888.

8831. Edwin Chatham, for "A new or improved apparatus for crushing and mixing mortar." June 16, 1888.

8832. George Henry Leane, for "Improvements in the method of constructing buildings and works in alluvial soils." June 16, 1888.

8877. Frederick Pilling, for "Improvements in roller-blind furniture." June 18, 1888.

8960. John King, for "Improvements in flushing cisterns or water-waste preventers." June 19, 1888.

9017. Thomas Ash and Richard Peacock, for "A window-fastener." June 20, 1888.

9054. William Peyton, "An improved chimney-head or pot." June 21, 1888.

9098. Andrew Smith, for "Improvements in Venetian blinds." June 21, 1888.

9104. Reginald Crooke, for "Improvements in the construction of drying stoves, particularly applicable for use in the manufacture of gunpowder." June 22, 1888.

9108. Doctor Craven, for "Improvements in shutters and sunshades, and appliances connected therewith." June 22, 1888.

9111. John Cumming, for "Improvement in surfaces for

printing, embossing, and ornamenting fabrics and papers, &c. June 22, 1888.

9112. Richard George Jones and John Henry Butterworth, for "An improved drawing and ruling pen." June 22, 1888.

9127. William Firth, for "Improvements in pit props, bars, or girders." June 22, 1888.

9138. Francis Joseph James Gibbons, for "Improvements in fanlight openers." June 22, 1888.

9163. Thomas William Twyford, for "Improvements in or additions to water-closets." June 23, 1888.

9179. Joseph Frederick Thompson, for "Improvements in locks, and in the means for operating the same." June 23, 1888.

9184. Emilie J. Tobin, for "An improved system of ventilating dwellings and other structures." June 23, 1888.

9208. Frederick Russell, for "An improved method of ornamenting glass." June 23, 1888.

9271. Alfred Coleby Emery and William Henry Taylor, for "An improved appliance for use when jointing pipes." (Complete specification.) June 25, 1888.

9274. Benjamin Lane, for "Improvements in or connected with window sashes." June 26, 1888.

9278. Thomas Feather, for "Improvements in the formation and construction of the jointing of pipes." (Complete specification.) June 26, 1888.

9317. Richard Joseph Stephens, for "Improvements in or relating to fastenings for casement windows and the like." June 26, 1888.

9377. Ralph Edwin James and Alfred Haley, for "Improvements in apparatus for heating water for bath or other purposes." June 27, 1888.

9388. Arthur Ramsden, for "Improvements in sewer and other pipe joints." June 27, 1888.

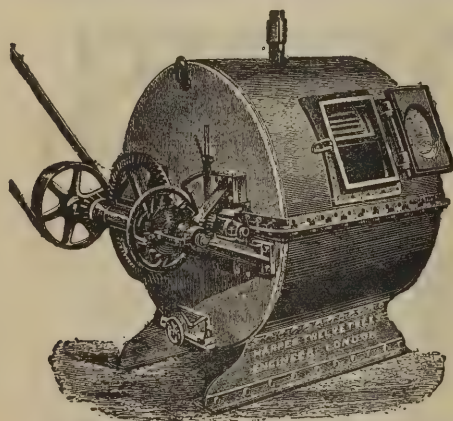
9403. William Thomas Symons and Lewist Prust Symons, for "Improvements in materials for floors or covering for floors and walls and other purposes." June 28, 1888.

9409. Josiah William Saunders, for "Improvements in sash fasteners." June 28, 1888.

9418. John James Mann, Reginald Arthur Smith, and Charles Mark Dorman, for "Improvements in portable pneumatic apparatus for dressing stone and other purposes." June 28, 1888.

9451. John Addy Hopkinson and Joseph Hopkinson, for "Improvements in stop-cocks." June 28, 1888.

9460. Charles James Grasmus Kinslow, for "An adjustable mulet gauge for carpenters and joiners." June 28, 1888.



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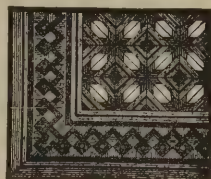
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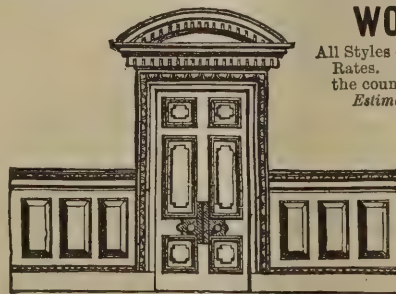
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## PROVISIONAL SPECIFICATIONS ACCEPTED.

16269. Thomas Byfield, for "A wooden telescope window blind roller." Nov. 26, 1887.  
 2285. Harry Evilyn Tullet, for "A safety sash fastener." Feb. 15, 1888.  
 6661. William Coulsell, for "A locking pin combination T and set square." May 4, 1888.  
 6892. William Crisp, for "Improvements in locks." May 9, 1888.  
 7223. George Smith, for "Improvements in sockets for earthenware pipes." May 15, 1888.  
 7638. William Snellgrove, for "Improvements in grips for blind and other cords." May 24, 1888.  
 7604. Walter Allan Bois, for "An improvement in door and like barrel bolts." May 23, 1888.  
 7781. John Charles Jeffrey Smith, for "Improved apparatus to be used in the manufacture of cement." May 28, 1888.  
 7811. William Orr and Peter Stuart Brown, for "Improvements in glazing." May 29, 1888.  
 7815. John Knight Champion, for "Lock bricks." May 29, 1888.  
 7878. George Andrew Hobson, for "Improved construction of metal floorings or roofings for bridges, &c." May 29, 1888.  
 7905. James Dougall and Thomas Davies Harries, for an "Improved artificial stone." May 30, 1888.  
 7925. Henry Thomas Holloway and Henry Holloway, for "Improvements in block floors or pavements." May 30, 1888.  
 7936. Louis Christophe, for "Improvements in making of roads, paths, or ways." May 30, 1888.  
 7976. William George Margetts, for "An improvement in the manufacture of Portland cement." May 31, 1888.  
 8043. James Harry Edwards, for "Improvements in the method of locking door latches."  
 8115. Alexander Sharp, for "Improvements in door handles." June 4, 1888.  
 4569. Joseph Sadler Garthwaite, for "Automatic cut off for gas-burners and gas-brackets." March 26, 1888.  
 6027. William Henry Harling, for "An improved method of holding needles on legs of drawing instruments." April 23, 1888.  
 7027. John Wareing Wolloms, for "Improvements in window fastenings." May 11, 1888.  
 7253. William Harte, for "Improved device for regulating window-blind and other cords."

7381. Giovanni Luigi, for "Improvements in window-blind rack pulleys." May 18, 1888.  
 7502. Arthur Henry Oakden and William Charles Sharpe, for "Improvements in paint burning off stoves." May 22, 1888.  
 7664. Henry Somerville Fearon, for "Improvements in the construction of fireproof floors." May 25, 1888.  
 7820. Thomas Robert Shelley, for "Glazing roofs and sides and other portions of railway stations, conservatories, billiard-rooms, and other structures." May 29, 1888.  
 8007. Archibald Dichmont, "A combined sliding sash and French windows." June 1, 1888.  
 8130. George Liscoe, for "An apparatus for mechanically separating solids from fluids of sewage." June 4, 1888.  
 8270. Charles Ellis, for "Improvements in Ventilators." June 6, 1888.  
 8313. Parlane Macfarlane Walker, for "Improvements in apparatus for securing the ventilation of rooms and buildings." June 7, 1888.  
 8364. Carl Weissshuhn, for "Improvements relating to the manufacture of wood pulp, and to apparatus for use in such manufacture." June 7, 1888.  
 8371. William Edwards, for "Improvements in the prevention of the pollution of rivers and watercourses from manufacturer's polluted water and waste, and for cleansing and purifying ordinary river waters for the use of manufacturers in their business, and for the recovery of expensive materials used in certain trades, as in paper mills, dye works, and others." June 7, 1888.  
 8391. James Craig, for "Improvements in flush-out water-closet basins." June 8, 1888.  
 8414. Felix Schenk, for "Improvements in hygienic desks, tables, and seats for use in schools and other places." June 8, 1888.  
 8521. James Coulter, for "Improvements in stone-dressing machinery." June 11, 1888.  
 8525. Frederick Lawrence Rawson and Philip Jolin, for "Improvements in electric trembling bells." June 11, 1888.  
 8562. John Osgerby and John Lea, for "Improvements in chimney tops." June 11, 1888.  
 8612. Matthew Cranswick Greenhill and Charles Longbottom Hindle, for "An improved clip or clamp for the use of artists and others." June 12, 1888.  
 8651. Theodore Schonheer Schoner, for "Improvements in locks." June 13, 1888.  
 8677. Henry Cullabine, for "Improvements in window-blind rollers and the method of securing the blinds thereto."

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### TESTIMONIALS.

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 SIR.—I have much pleasure in testifying to the efficiency of your patent warm-air fire-grate. It has been very successful, and given every satisfaction where I have used it.  
 Yours, &c., JAMES WEIR, F.R.S.B.A.,  
 6 John Street, Bedford Row, W.C.

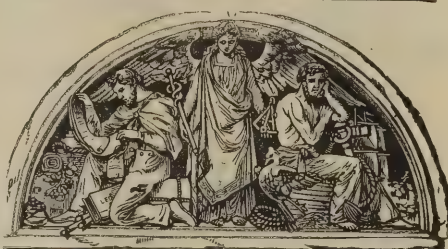
From ARTHUR W. BLOMFIELD, M.A., Esq., Architect,  
 28 Montagu Square, London, W.  
 Mr. Grundy, of Tyldesley, near Manchester, has carried out his plan of warming in several churches built under my direction, and in each case it answers remarkably well, and has given great satisfaction.

From Professor W. B. ROBERTSON, M.D., West Dulwich, S.E.,  
 September 1, 1887.  
 DEAR MR. GRUNDY.—I value your apparatus very highly indeed. I regard it as the greatest comfort I have in this house.

From Rev. A. FERGUSON SMYLY, Dean of Derry, The Deanery,  
 Derry, September 16, 1887.  
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To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

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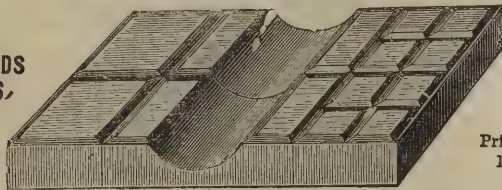
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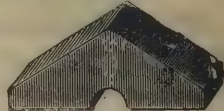
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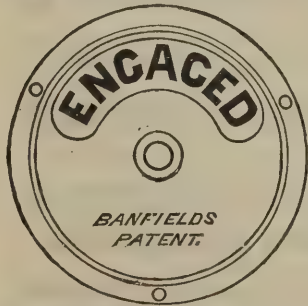
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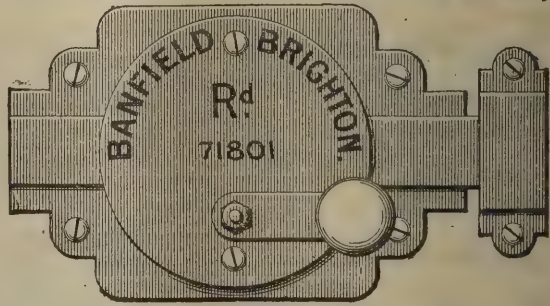
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This Lock supplies a want which has long been felt for a reliable and inexpensive means of showing when an apartment is engaged. By simply turning the handle, the door is locked and the word "Engaged" shown on the outside. Conversely, the act of unlocking withdraws the word from view. This Lock is a distinct improvement over all others; there are no wheels to clog, the working parts are covered, and it cannot fail to indicate accurately. It is very neat in appearance, the acme of simplicity, and the cheapest contrivance of the kind yet introduced. It can be easily attached to doors of any thickness, or either hand. A loose key can be supplied at a small extra cost for opening the lock from the outside, an advantage possessed by no other Indicator. The principle can be applied to existing locks, either mortice or rim.



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## COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may at any time within two months from the date of the official journal of the Patent Office, in which the acceptance of the complete specification was advertised give notice at the Patent Office in the prescribed form of such opposition.

10426. Thomas Moore, for "Improvements in lifters and fasteners for skylights, window sashes, trap doors, and the like." July 27, 1887.

11265. Henry Frederick Baugert, for "Improvements in flush bolts." August 18, 1887.

11324. Joseph Smith and Albert Roberts, for "Improvements in lavatories and in apparatus connected therewith." August 19, 1887.

11362. Henry Harris Lake, for "An improved parallel ruler." August 19, 1887.

12524. George James Snelus, William Whauvond, and Thomas Gibb, for "An improved preparation or manufacture of cements." September 15, 1887.

14536. Gustav Henry Block, for "Improvements in and connected with apparatus for the reproduction of writings, drawings, and other delineations." October 25, 1887.

8917. Thomas Seaville Truss, for "Improvements in cowl for chimneys and ventilating shafts." June 22, 1887.

9074. William Henry Leaver Cooper, for "Making, finishing, and drying plain or socketed stoneware sanitary pipes or tubes."

10511. William Norman Swettenham, for "Automatic flushing apparatus for water-closets." July 28, 1887.

11508. Richard Ridgway Harrison, for "Improvements in devices for opening, closing, and adjusting fanlights, sashes, and the like." August 14, 1887.

11624. John Alexander Hanna and Thomas Foulkes Shillington, for "Improvements in stoves." August 26, 1887.

13065. Edward Weldon, for "Improvements in the method of attaching the blades of saws to the handles." Sept. 27, 1887.

3001. William Johnson, for "Improved means of securing door-handles and latch followers to spindles." Feb. 28, 1888.

7747. George James Snelus, for "An improvement in the manufacture or preparation of cement." May 26, 1888.

7751. Hynek Breuer, Frank Skocdopole, and Paul Fundd, for "An improved window-sill." May 26, 1888.

7774. John George Dunn, for "Improvements in stays for casements, fanlights, and the like." May 28, 1888.

7792. Alfred Henry Ford, for "Improvements in sliding doors." May 28, 1888.

7858. Lorenz Bommer, for "Improvements in spring hinges." May 29, 1888.

## PATENTS SEALED, JUNE 29, 1888.

9504. Charles Douglas Norton, for "Improvements in window fasteners or catches." July 5, 1887.

2799. James Hird & John Alexander Ford, for "Improvements in and fittings connected with casement and sash windows, doors, and such like structures." Feb. 24, 1888.

3794. Sidney Jennings, for "Improvements in urinal basins." March 12, 1888.

5526. Felix Léon Edoux, for "Improvements in elevators or lifts." April 15, 1887.

7872. William Edward Rickard, for "An improved machine for felling trees." May 31, 1887.

8140. William Dunsmore Bohm, for "Improvements in the manufacture of stair treads, flooring, and other similar wearing surfaces." June 6, 1887.

8683. John William Kershaw, for "Improvements in and appertaining to door or gate handles or knobs, and to the fastening of the same." June 16, 1887.

8707. Henry Darby, for "Improvements in water-heating apparatus for domestic and other purposes." June 16, 1887.

9434. Joseph Easey, for "An improved automatic apparatus for dry-closets and water-closets."

10114. Irwin Clarke Wallas, for "Improvements in the heads of rain-water and other pipes."

596. Charles Browett, for "Preventing the rattling of windows, doors, and shutters." Jan. 14, 1888.

1885. Robert Sutcliffe, for "Improvements in apparatus for automatically unbolting doors." Feb. 8, 1888.

3555. Charles William Barron, for "Improvements in and connected with window sashes." March 8, 1888.

## ABRIDGMENTS OF SPECIFICATIONS TO JUNE 30, 1888.

"Fireproof-holders for joists for party walls." Cantle, J. A., 11438. An iron shoe or socket made so as to receive wooden joists, girders, or struts, so as to avoid their being built into party walls. Two slots are left in the lower part of the pro-

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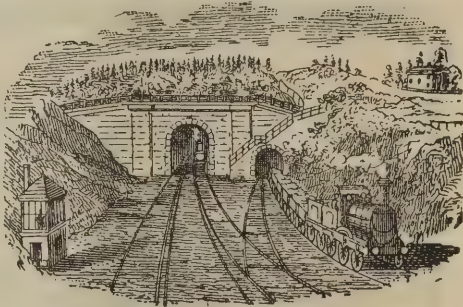
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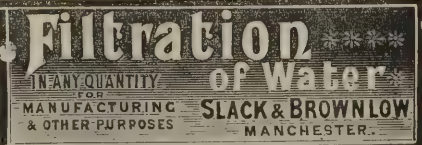
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jecting shoe, so that the laths for plaster ceiling may be nailed through to joist.

*Claim.*—A fireproof holder for joists for party walls, constructed, as described and illustrated, substantially, and as set forth.

"Supplying and regulating heat to buildings, &c." Thompson, W. P. (for Johnson), 3438. This invention relates to automatic supply and regulation of heat to apartments or buildings by a system of apparatus in which electricity controls a fluid under pressure, and the fluid under pressure operates the controlling valves of the heating apparatus. This invention is entirely automatic, and requires no attention for long periods of time. To this end sources of power are made use of which are constant, and which are supplied without the attention of the occupants of the apartments of which the temperature is to be regulated. In order to render the system automatic, water is supplied from a city main, and delivered constantly under pressure as a power for compressing air, and the air thus compressed operates the valves of the heating appliance under the control of automatic electric devices.

"Door knobs." Boulton, A. J. (for Crawford), 6472. The shanks of the knobs are attached directly to the washer-plates instead of being fastened by set screws to the spindles, which in this invention are made to turn with the knob by the engagement of their square-sided ends with the singularly shaped cavities in the shanks and knobs. These shanks are secured to the washer-plates by means of a projection on the surface lying inside the recessed washer-plate.

*Claim.*—The above mode of attaching the shank of a door knob to the washer-plate on a door or lock by means of a groove or channel formed in or on the surface of the shank, which is encircled by the edge of the orifice of the washer-plate, and retained therein by the engagement of the sides of the groove or of flanges with the inner face of the recessed washer-plate.

10762. (1887) "Improvements in the arrangement of fireclay, terra-cotta, or firebrick domestic fireplaces." William Lewis, Old Cock Hotel, Halifax. The fire-brick backs and side lumps are built up in as large pieces as are convenient, and these are dovetailed together, or have grooves and rebates so as to prevent any piece sliding away from the adjoining brick.

*Claim.*—The method of constructing fireclay backs for fireplaces, in sections dovetailed or locked together by projecting bays, forming a component part of the sectional piece requiring

to be locked, substantially, as indicated in the accompanying drawings.

3785. (1888) "Improvements in water-heating apparatus." Joseph Winterflood, 346 Euston Road, London. Four double cylinders are placed one within another. (The outer cylinder being twice the depth of the inner ones and the innermost double cylinder being covered with a plate top and bottom to form a boiling chamber.) The space between each double cylinder (when they are placed one within the other) forming the outlet for the waste products of combustion. The tops of the cylinders are connected together with tubular stays, so as to form a continuous watercourse from the outer to the inner double cylinders. Beneath the whole of the cylinders I place a number of Bray's burners inserted to form the heating power.

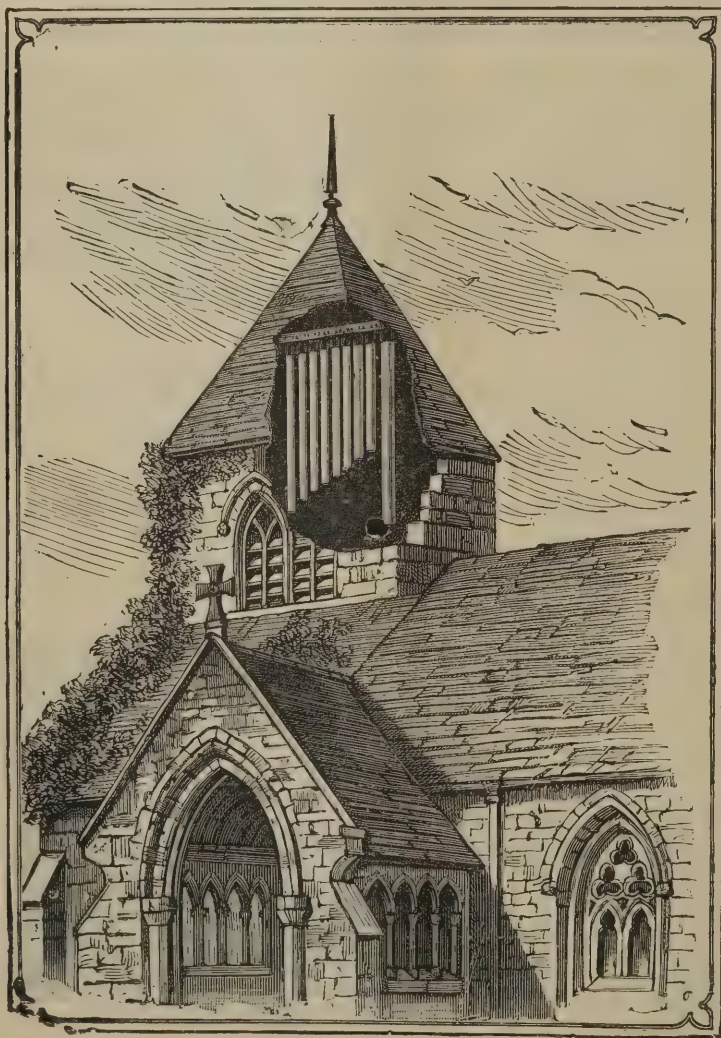
11829. (1887) "An improved locking sash fastener." W. R. Crozier, 1 Leadenhall Street, E.C. This invention consists in forming lateral extensions upon the shank of the well-known knob or thumb-piece, which extensions enter a circular hole in the staple when the bar is pulled under the latter, and, being turned in the said hole, are prevented by the comparative narrowness of the slot, at which they are entered, from being withdrawn from the staple until they shall have been turned back to the relative positions which they occupied at the moment of entering.

*Claim.*—I.—The combination, in a sash fastener, of bar extension, and staple having a slotted hole adapted to receive said extension, substantially, as described and illustrated in accompanying drawings.

6791. (1888) "An improved device or bush for fixing trunnions of basins used in 'tip-up' lavatories, and for other sanitary purposes." G. H. Jennings and Sidney Jennings, sanitary engineers, Palace Wharf, Stangate, London. This invention is an improvement on Patent 4796 (1881), filed by Messrs. Jennings, and has for its object an improved device or bush for more securely fixing and strengthening the trunnions of tipping basins.

*Claim.*—The improved device or bush for fixing the trunnions of tipping basins used in lavatories, and for other sanitary purposes, substantially, as and for the purpose described and shown in the accompanying sheet of drawings.

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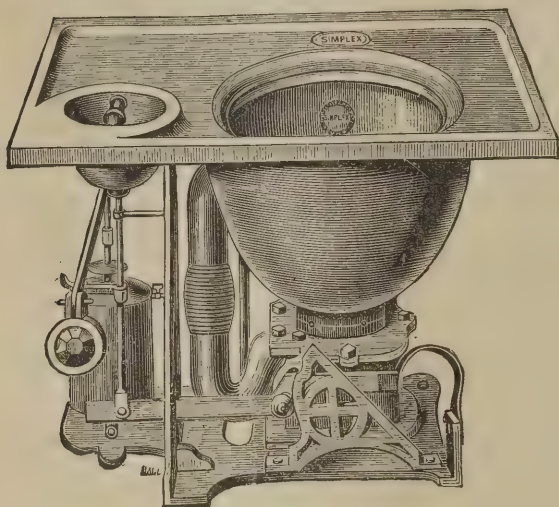


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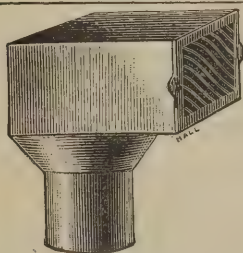
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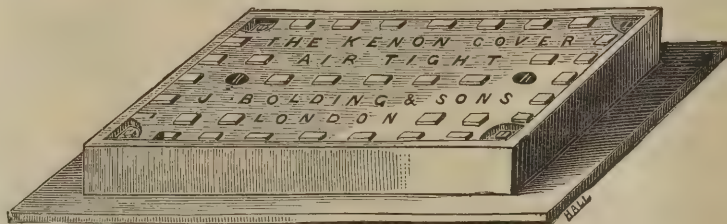


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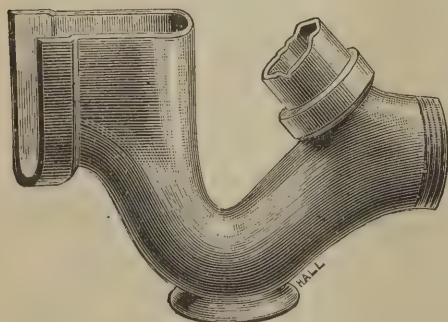
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# The Architect.

## THE WEEK.

ACCORDING to many amateurs and publishers, the greatest of the modern French engravers was ALPHONSE FRANÇOIS, who died a few days ago in his seventy-seventh year. He was most successful with plates after pictures by great painters, and he was equally competent in rendering styles that might be said to be opposed. Thus for the French Government he engraved FRA ANGELICO'S *Coronation of the Virgin* and the *Miracles of St. Dominic*, together with INGRES'S *St. Symphorien*, while not long since he produced a plate from one of DORÉ'S pictures for a London firm. The three painters were far apart in style as in time, yet M. FRANÇOIS suggests their characteristics as far as engraving will allow. He also was commissioned for plates after TITIAN, PAUL VERONESE, and CORREGGIO. He helped to make PAUL DELAROCHE popular by plates from that painter's French scenes. His *General Buonaparte* and *Marie Antoinette after her Condemnation* are masterpieces. M. FRANÇOIS was a pupil of M. HENRIQUEL-DUPONT, who still survives, and was a member of the Académie des Beaux-Arts.

THE Lord Chancellor of Ireland and the Lords Justices of the Irish Court of Appeal have given judgment on a point of law relating to arbitration. The contractors for the new Waterworks to supply the town of Ballymena, and the Town Commissioners did not agree, and in consequence the works were suspended. The contractors then commenced an action to obtain any moneys which were owing, as well as damages for breach of agreement. The Town Commissioners, who probably had not much faith in Irish juries, parried the attack by proposing that the dispute should be referred to Sir FREDERICK BRAMWELL, as was provided by one of the clauses in the contract deed. The Vice-Chancellor declined to sanction the arrangement or stay the proceedings, as the matter in dispute was not of the kind which was referable to arbitration. The Commissioners appealed, and are again defeated. The argument on behalf of the plaintiffs was that owing to the delay and neglect of the defendants, it was absolutely impossible to fulfil the conditions of the contract, and that in consequence the plaintiffs were entitled to revert to their original rights, as there was no question for arbitration. It is thus evident that the arbitration clause is considered as having only secondary importance, and is not to be taken as superseding the function of a court of equity.

A PAPER read by M. HOMOLLE before the French Society of Antiquaries reveals the name of a Greek sculptor who flourished about seven centuries before the Christian era—that is, IPHICARTIDES of NAXOS. It was found on the base of a monument at Delos of pyramidal form, of which a figure of APOLLO may have formed a part, for the feet are still visible.

It was stated by Mr. FORWOOD, M.P., on Tuesday, before the Parliamentary Committee on Town Holdings, that from his experience he believed that the houses on the leasehold land belonging to the Liverpool Corporation are superior in construction, sanitation, &c., to those erected on freehold land. At the same time Mr. FORWOOD acknowledged that the bulk of jerry-built houses in Liverpool will be found on leasehold ground. The Corporation property in Liverpool is of great value, for after excluding what is held by tenants at will (which is worth 18,000*l.* a year) and the markets, the assessable value is 656,000*l.* Most of it is held on seventy-five years leases, and, according to Mr. FORWOOD, there is no great desire among the tenants for enfranchisement. There are about 5,000 leaseholders. For the best property it is common to seek renewal of leases on the Corporation terms, but low-class property of the value of 2,000*l.* a year has fallen into the hands of the Corporation. The payments from the property are added to the city fund, and it appears that many of the finest buildings in Liverpool were erected from that fund without any need to levy a rate. Mr. FORWOOD advised that the

Corporation should have power to sell the reversions of leases, as under present conditions there was no interest on the part of the leaseholder to purchase the reversions, because he got the renewal on such favourable terms that it was better to renew than to purchase the reversions; but it would be a great mistake to compel the Corporation to sell their leaseholds, for it would practically be making a present of them to the leaseholders. Although the by-laws are stringent and are carried out, they do not produce such good buildings as are obtained under the covenants of the Corporation leases.

It is now arranged that the first plate produced by the new Société des Graveurs au Burin in Paris will be from the *Three Graces* by RAPHAEL, which belongs to the Duc d'AUMALE. M. DIDIER, the president of the society, has undertaken the work. The fashion for etchings, which is now almost universal, has caused engraving *au burin* to be much neglected. Just as line engraving is a lost art in England, it is feared that the art will also decline in France. To prevent that calamity the new society was founded. It consists of two hundred amateurs who pay a thousand francs a year. In return each member will receive an impression of the plates, which are to be produced at the rate of one plate a year. When the limited number of impressions are taken the plate will be destroyed. Subscription to the society is therefore not only a patronage of art but it is a speculation of a profitable kind, for the engravings are sure to increase in value as time runs on.

THE programme of the meeting of the British Archæological Association, next month, in Glasgow, is sufficiently interesting to justify the innovation of crossing the Border. The arrangements will be in charge of the local Archæological Society, in which Mr. JOHN HONEYMAN is one of the prime movers. The Marquis of BUTE has undertaken to preside, and, apart from the prestige which, through his Lordship's position, will be imparted to the proceedings among a people like the Scotch, it is well known that the Marquis of BUTE has studied archæology in a comprehensive sense, and will therefore be able to give aid in the discussions. In Glasgow there is much to be seen which is of importance. A day may well be spent in the cathedral, which would be considered most interesting in all parts if the stained glass could be covered. The collection in the temporary museum of the exhibition would alone be worth a journey to Glasgow, but we hope the crowds will be excluded while the members are in the "Bishop's Castle." The Isle of Bute will be visited, and no doubt the new residence of the Marquis of BUTE will be visible. At present, care is taken to conceal Dr. ANDERSON'S building. Rothesay Castle is well conserved. It is needless to say the Bute district is most picturesque. There will be also excursions to the Roman wall and Linlithgow, Bothwell Castle and Paisley Abbey, Craignethan and Lanark, the Torwood Broch, Bannockburn and Stirling, Dunblane Cathedral, Doune Castle, and the Roman camp at Ardoch.

ASMODÉE, that most disinterested Diable Boiteux, in order to reveal to CLEOPHAS what passed in Madrid, was obliged to remove the roofs of the houses. He waved his right arm, and presto! they all disappeared. An inventor in Brighton, named FARR, has devised and patented a different way of obtaining that sort of knowledge. His "Farrscope" is described in legal phraseology as an appliance for buildings or structures for enabling the interior of rooms or compartments to be observed from another room, compartment, or place exterior to such rooms or compartments. The revelations are brought about by the aid of tubes and revolving mirrors. The invention is enough to terrify, if not to reform, the world. Supposing, for example, the taxpayers of England could unobserved observe what is being done in any one of the Government offices, and how officials amuse themselves at an enormous expense to the country! What blue-book would be so convincing about the need of Civil Service reform as one glance in the "Farrscope"? There are many other cases where the invention will also be exceedingly inconvenient. It may be of some use in diminishing the cost of superintendence in large workshops.



## THE ITALIAN EXHIBITION.

THE collection of pictures at the Italian Exhibition is more numerous than any hitherto seen out of Italy. In 1857, when there was the fellowship of a common interest between the French and Italians, no more than fifty paintings could be found on the walls of the International Exhibition of Paris, and small as was the number, it comprised works by Italians who were living abroad, and works by artists who were simply residents in some Italian city. Sir FREDERICK LEIGHTON, for instance, was classed among the few Roman painters (his picture being *The Reconciliation of the Capulets and Montagues*), although a native of Scarborough and the pupil of a German. The scarcity of Italian paintings in the London Exhibition of 1862 was no less suggestive of the decline of art. At the Italian Exhibition in West Kensington there are about ten hundred paintings and drawings, exclusive of those which are to be found in the industrial department. They are not all, it is true, works of the highest class, and there are as many degrees of merit among them as can be seen in an exhibition of English pictures, but the humblest is not without interest, if it were only to know what kind of thing is the Italian "pot-boiler."

Two of the galleries show works which are lent, the Italian Government contributing most of the pictures in one room, while the pictures in the second room belong to Colonel J. T. NORTH. The King of ITALY has sent a couple of works out of the Royal Gallery. Nearly all the remainder are pictures which await owners, and as they were painted in order to captivate Italian patrons, they are not to be judged as if they were intended to be seen in Burlington House. It must not, however, be supposed that the collection contains pictures on which modest eyes cannot gaze with pleasure, or which will shock decorum. Far more nudities are now to be seen in the Royal Academy, and there is a general absence of that dallying with vicious scenes which is common enough abroad. Evidently there has been a vigorous weeding, and whatever may be the defects of the pictures, the majority will bear explanation to children.

It is always unsafe to speak of pictures as a whole, but in this case there are characteristics which may be considered as general. In the first place, the colour will be considered as over-glaring; but it should be remembered that they were painted to be in keeping with things which are very bright. The old Italians were not afraid of colour, and did not care to anticipate time in subduing and transforming it; and although some artists have a preference for French greys and browns, as yet the national taste has not gone in that direction. The state of the relations between France and Italy may prove an obstacle to a general adoption of the French system. The colours are not only of the brightest, but in order to produce effect they are very often laid on with an *impasto* that is not to be judged by the canons of English art. As a rule, the method is successful with those who employ it, and it is preferable to the thin painting of some canvases, which at first sight would appear to be the work of Germans.

As regards choice of subject, there is a lack of inspiration. In landscape there is a close adherence to nature, and no great variety in the selection. A large percentage of the pictures will be found to be illustrations of Venice. In figure subjects, some fields which formerly were most productive are neglected. There are pictures of church subjects, but not one could have been painted for the walls of a church or chapel. Mythology is left to the sculptors. A *Galatea*, which was inspired by RAPHAEL's picture, looks out of place amidst scenes of prosaic life. ORPHEUS appears as a shabby old fellow playing a flageolet for the entertainment of his cat and dog. When we see a *Bacchante* it is evidently a portrait of a model. Indeed, one artist who shows a boy in classic nudeness, and with a classic brownness of skin, recognises the altered state of affairs by describing it as a portrait, and revealing the name of the subject. Admirers of some of M. GERVEX's nude countesses, which appear from time to time in the Salon, would desire equal frankness. It is evidently felt in Italy, as elsewhere, that there is no use in attempting subjects from ancient Greek or Roman life, unless one makes a sort of systematic study of archæology. In the *Funeral*, by

G. ARIANI we see the result of that kind of preparation, and, although the ancient mourners appear to go through their duty in a perfunctory manner, the picture may be none the less true on that account. The black robes and the black bull, which is about to be sacrificed, stand out strongly against the red walls of the temple. It is the one picture which exemplifies the new spirit. *Virginia at her Bath*, which is near it, is only classic in title. In the room containing Professor SCIUTI's works there are several pictures of ancient historical subjects in an academic style, but from the size of the canvases accuracy of detail is not to be expected. Historical scenes of a later time are not in much favour, and French precedents appear to be followed. Such pictures as *A Game of Chess* between the Italian and Spanish champions in the time of PHILIP II., or *Richelieu at Court*, might easily pass for French works from the manner of treatment.

It is also remarkable how few pictures are inspired by incidents in the lives of great Italians who were not princes, warriors, or statesmen. The noblest of all the pictures in the Exhibition reveals what can be done if artists and patrons were less indifferent. It is one of the ways in which the Italians do not imitate the French, for it would be impossible to have a thousand French pictures (unless precautions were taken in the selection) which would be equally barren in representations of great artists and great writers. The picture we have just mentioned is F. JACOVACCI's *Vittoria Colonna and Michel Angelo*. It represents the last visit of the artist to the room where lies the corpse of the lady who was admired by him at a respectful distance as the *sedes sapientie*. MICHEL ANGELO's companion draws him from a scene which was becoming painful. The figures are all life-size, and by a master hand. VITTORIA is robed in white stuff, resembling satin in texture; and as the contrast between it and the white face might appear too marked, a lace collar, also of white, is introduced as an intermediary. There is no straining after effect; the pathos depends upon the situation. It is a pity a second picture by the artist was not obtainable for the Exhibition. The *Giordano Bruno*, by C. F. BISCARRA, can hardly be called a success. The attempt of one monk to obtain a retraction from another is not novel, and in this case we find no new features. The unfortunate pantheist wears the habit of the Order to which he once belonged, but as he became a civilian he would hardly be allowed to reappear as a monk. Italian artists give little heed to questions of costume. Then, again, the head appears to be a portrait of somebody now living who has not the aspect of a philosopher. A comparison of this head with one of SAVONAROLA in terra-cotta, belonging to Sir FREDERICK LEIGHTON, will suggest the difference between the creative and the mechanical methods of realising the past. Another picture which deserves recognition as having a subject connected with an artist's life is E. ERULI's *Pergolese at the Funeral of the Princess Spinelli*. The young composer (he died in his twenty-sixth year) is represented kneeling in the church before the corpse of the princess, and the whole of the funeral party stand still in order not to disturb his inspiration. The evidence for the incident is not trustworthy, and the picture is arranged in a way that suggests a scene in an opera rather than a religious ceremony.

It is among pictures of everyday life and commonplace incidents that the Italian artists are most successful. A study of the heads in terra-cotta and bronze of street arabs, beggars and old women, will convince any one about the realistic power which is in Italy. Some of the heads are not only representative of the lower classes, but they seem to be formed out of the mud of streets, in order to be more suggestive. Portraiture of that kind is not without trickery, but it suits artists who are only partially taught and cannot expect to receive large sums for their works. Ugliness is easily rendered, and it must be admitted that the cleverest pictures in the Exhibition are those which have some relationship to the new form of sculpture. Classicism and tyranny, we suppose, are associated in the minds of Italian artists, and one of the results of national independence is seen in the reaction against any treatment of form which was sanctioned by ancient canons. But the realism on canvas is not so remarkable as the realism of the sculpture, which might be said to be perfect if that term can be considered as applic-



able. The realism in painting and sculpture become more remarkable from being the work of Italians. There must have been much research exercised before the heads in the *Good Joke* or the *Soup Kitchen* could be observed, for Italian beggars, as a rule, are better looking than they are here represented. In fact, there is a superabundance of pictures of old people.

If we follow the order of the catalogue, the first picture which is met with is C. STRATTA's *Poor Man's Carnival*. It is a painting of a part of a crowd, who are assembled around the stand of a charlatan. The figures of the masqueraders are life-size, and are painted with much force. Like so many other works in the Exhibition, it is evident that most of the figures are portraits. This work has a wall to itself. In Room E (Turin) the *Segretario Galante*, by D. COSOLA, is one of several pictures which have the life of an Italian soldier for subject, and the Bersaglieri seem to secure a monopoly of attention, like the Zouaves formerly with French artists. In this case a soldier is writing a letter for a comrade in a field where tents are set up. *Punishment* is one of the church scenes, and shows a sacristan pulling a boy's ear for allowing a thurible to fall. His cries are loud enough to attract the attention of a woman who is kneeling at confession. It is the kind of picture that would serve for reproduction as a German lithograph. C. TURLETTI's *On the Track* is an old monk about to proceed on a begging excursion, but it is entirely free from any touch of caricature. Another pleasing work, by the same artist, is *Christmas in the Cloister*, where several children are seen entranced by a simple sort of representation of the Nativity. *New Times and Old Times* is not a well chosen title for a painting in which several figures in eighteenth-century costume are represented near one of the Venetian canals. The *Boys playing Truant*, by G. FALCHETTI, is a scene by the river side—some boys are teasing geese, and others are around a donkey, who seems to enjoy his share in the sport. The figures are mostly nude, and show careful study of the model. G. TESIO's *Cupid* is a boy of fifteen, well modelled, with wings of white feathers which are finely painted, although they offer too strong a contrast with the flesh. In this picture CUPID wears a jewelled band around one of his legs. There is a fine sombre landscape by SILVIO ALLASON in this room. Room D is also assigned to Turin. *Forbidden Fruit*, by G. GIANI, is a scene in a café thoroughly French in style. G. GROSSO's *Grand Canal, Venice*, is spoiled by the appearance of a black hulk which occupies a great part of the foreground. Although it may aid to bring out the distant parts, it is an eyesore in a picture which otherwise shows skill. *Primavera*, by G. CAVALLA, shows a couple of rather vulgar women in light dresses, buying flowers. A. LUXORO's *Genoa* is more a view of a suburb of the city, and hardly justifies the title. The *Cappella Reale, Turin*, by G. CANOSA, is, like all the representations of architecture in the Exhibition, an example of careful work. The dark walls offer a strong contrast to the white statuary. C. BISCARRA's *Entering Italy by the Valley of the Susa* is one of those landscapes which clash with ideas about the appearance of Italy which are formed before visiting the country. The *Halt of Bersaglieri*, by M. CALDERMI, is a scene in one of the streets of Turin.

In Room F there are several works which denote the versatility of Signor BAUDUC CERRUTI. Some are Arab scenes, but there is that stiffness about the horses which is not uncommon in paintings of the animal by Italians. The four sketches by G. LAVINIO, from buildings in Venice, are excellent, and he has a fine view of the Grand Canal. The *Church of Marcheta*, by G. CANOVA, is also deserving of attention. *Declamation*, by G. BARBAGLIA, depicts a young abbate reading from a manuscript before a lady who is seated. It is vigorously painted throughout. In this room will be found one of the few pictures that can be called religious, viz., *Golgotha*, by L. RAYMOND. The subject is the removal of the cross at night and it is treated with due reverence.

In Room I is E. FERRONI's picture, *Before the Squall*, a peasant woman tying her shoe in readiness for her journey. It is dark in colour, but figures and landscape are admirable, and there is as little posing in this picture as in one of MILLET'S. It is the only example by the artist in the Exhibition. G. RAGGIO's *Buffaloes of the Roman*

*Campagna* would pass for one of JULES DIDIER'S works. Room G has one finely finished work in M. BOUVIER'S *Philemon and Baucis*. On the opposite side is the best of all the portraits, *Walter Severn, Esq.*, by BARZAGHI CATTANEO, who is no less successful in portraiture than in fresco. He is now living in London, and his portrait of the President of the Dudley Gallery is almost enough to insure his success. M. MAGISTRETTI's two old priests in the stalls of a church is full of character, but the silver candlesticks on the altar are so like reality as to secure most attention. L. STEFFANI in *On the Lagoon* has found a good subject, a number of boys bathing, some being about to dive from one of the long posts. In Room H the most attractive work is *The Wave*, by M. POMPEO, which denotes a good eye for nature. G. INDUNO, in *A Flitting*, paints a removal from one of the upper floors of a house, the pictures and furniture being let down by ropes. M. BIANCHI'S *Margherita* will not please students of GOETHE. In R. TANCREDI'S *Julius II. after the Battle of Mirandola*, we see the belligerent pontiff marching at the head of his troops across the snow, and exciting varied emotions in the minds of the women and children who appear in the foreground, as the Pope seems almost to rise out of the ground. It would appear as if the painter was inspired by INGHERAMI'S comparison of JULIUS to NEPTUNE, who had only to show his head above the billows when their fury was calmed. The battle of Mirandola was fought in the winter, but JULIUS was too old to march, and had to be carried after the victory into the town. F. BERSINI'S *Reading* would be more satisfactory if painted to one-tenth the scale. An immense canvas is not needed to exhibit a monk reading at a fire (his back to the spectators) in a cottage. Room T contains several interesting works. The brilliancy of colour which is found in a Venetian fête is suggested by E. LANCEVOLTO'S *Regatta*. Colour is also strongly marked in the *Rocca di Papa*, a night scene with a balloon ascent. The *Lacrimæ Rerum*, by N. ATTANASIO, is a scene from a lunatic asylum, with five girls in white who use rosaries for other purposes besides praying.

The modern Italian school is of so recent a date, we must not be surprised if we see the consequences of many influences in the works. It is often said that imitation of the French is predominant, but the Exhibition hardly bears out that theory. From the variety of styles, the Italian painters might be said to come nearer the English. But while in England there is much striving after originality, the Italians, it must be said, are satisfied with whatever is nearest to them. There is much cleverness in Italy, by which work of a fairly good kind can be accomplished without much difficulty—and, indeed, what is genial in art is often the best—but works which need long and painful toil seem to be beyond the resources of the painters.

#### THE NATIONAL GALLERY.

THE report of the Director of the National Gallery states that the pictures purchased during the year 1887 were:—*The Holy Family*, by Marcello Venusti; *The Blood of the Redeemer*, by Giovanni Bellini; *A Muse inspiring a Court Poet* (?), by Dosso Dossi; *Portrait of a Girl*, by Domenico del Ghirlandajo; *Portrait of a Man*, by Sir Antonio Mor; and *Portrait of a Man*, by Heinrich Aldegrever.

The bequests and donations to the Gallery were:—*A distinguished Member of the Humane Society*, by Sir Edwin Landseer, R.A.; *Portrait of Sir Samuel Romilly*, by Sir Thomas Lawrence, P.R.A.; *Titania and Bottom* ("Midsummer Night's Dream, act vi., scene i."), by Henry Fuseli, R.A.; *The Virgin and Child*, by Luis de Morales; and three works by John Constable, viz.: *View of the House in which the Artist was Born*; *The Salt Box, Hampstead Heath*; *View on Hampstead Heath*; and the palette used by him.

The Director, in describing the rearrangement of the collection, says that the central staircase and five new rooms lately added to the National Gallery, and described in the last annual report, having been completed, so far as the builders' contract was concerned, in February 1887, were handed over for decorative painting to Messrs. Crace & Son, the firm employed by H.M. Office of Works for that purpose. The commission was executed with great promptitude, and by April 1 most of the rooms were ready to receive their contents. Meanwhile a scheme had been prepared for the rearrangement of the pictures. The desirability of classifying them under the several schools of painting to which they belong had been



apparent in the earliest development of the Gallery, and from time to time various efforts had been made to attain that object, but the rapid growth of the collection and the limited size of the building erected to accommodate it, notwithstanding repeated alterations and enlargement, greatly impeded those efforts, and rendered a consistently generic assortment of the works in question almost impossible. The recent addition of five new rooms afforded an opportunity, the first in the history of the Gallery, for attempting a more complete and systematic subdivision of the pictures, but though the present arrangement may be regarded as a step in the right direction, it has not been effected without compromise, and can hardly be regarded as final. More than one room even now may be called overcrowded. The influx of fresh acquisitions, for which space must be found, may at any time interrupt and disorganise the classification just adopted, and the prospect of such a contingency induces the trustees and Director again to urge upon H.M. Government the advisability of supplementing the work of the late Ministry by a further extension of the building. Between April 1 and May 31 the five new rooms and a vestibule on the eastern side of the central staircase were hung with pictures, while the contents of thirteen rooms in the older portions of the buildings were either wholly or partially rearranged, all the apartments having been renumbered as nearly as practicable in consecutive order.

The trustees and Director have renewed their application to the Lords Commissioners of Her Majesty's Treasury, urging their lordships to reconsider the question of restoring, either wholly or in part, the annual Parliamentary grant to the National Gallery for the purchase of pictures (suspended since 1885), and suggesting that at least the yearly sum paid by the public for admission on students' days (which may be estimated at 1,200*l.*), as well as the profits derived from the sale of catalogues, might be placed at the disposal of the trustees for the purpose above mentioned. Although their lordships were unable to accede to this request, they undertook to sanction an advance of 2,000*l.* from the Civil Contingencies Fund, for the purchase of pictures in 1887-88, should an opportunity occur of expending that sum with advantage to the Gallery. Their lordships have been also pleased to sanction the reinsertion of 100*l.* under Sub-head B in the National Gallery estimates for 1888-89 to cover the expense of the Director's official journey on the Continent, in the event of its being necessary for the inspection of pictures offered for sale.

During the year 1887 eighty pictures have been covered with glass, making a total number of 1,048 pictures so protected.

As nearly as can be calculated the National Gallery was visited by 787,522 persons on the public days during the year, showing a daily average attendance on such days (207 in number) of 3,804. On students' days (Thursdays and Fridays), when the number of visitors entering by payment is registered by a turnstile, 43,664 persons were admitted between January 1 and December 31, 1887; the admission fees (at sixpence each) amounting to 1,091*l.* 7*s.*, as compared with 1,198*l.* 7*s.* received in 1886. The total number of students' attendances at the Gallery on Thursdays and Fridays throughout the year was 26,649. Independently of partial studies, 523 oil-colour copies of pictures have been made, viz. 301 from the works of forty-eight Old Masters, and 222 from the works of twenty modern painters.

#### THE SCOTTISH SOLICITORS' LIBRARY COMPETITION.

THE Council of the Society of Solicitors before the Supreme Courts, after considering the reports and information received from professional gentlemen consulted, have unanimously resolved, says the *Scotsman*, that in their opinion the plan bearing the motto "Wisdom, Health, and Beauty" is entitled to the first place in the competition, and that the plans bearing the mottoes "Scottish Seventeenth Century" and "S.S.C." are entitled, the former to the first and the latter to the second premium. The author of the plan "Wisdom, Health, and Beauty" is Mr. James B. Dunn, architect, 116 George Street, Edinburgh, who, it may be remembered, was the author of the second premiated design for the Public Library buildings. The second design is by Messrs. M'Arthy and Watson, 137 George Street, and the third is by Mr. G. Washington Browne.

The new library buildings, designed by Mr. Dunn, will occupy a site immediately to the east of the Sheriff Court buildings, with a frontage to the Cowgate of nearly 150 feet. The treatment adopted by the architect as best in keeping with the surroundings is a free adaptation of the Scottish Baronial with Tudor features. In accordance with the memorandum issued by the Society, the architect has placed the library, reading-room, and stores in the topmost and second topmost storey of the building, and it is in his designing of these that he has found room for ornate treatment. The first four storeys of the building, which

are designed as artisans' dwellings, are quite plain. The upper part of the elevation to the Cowgate shows a centre portion with lower side wings—the main building, which contains the library proper, rising to a height of 90 feet above the street. It depends for effect partly on the large bays or oriels, which help to light the library, and the two side wings, and partly in the numerous ornamental chimneys, which, owing to the nature of the dwellings beneath, are a feature in the elevation. The windows have been corbelled out from the wall to a distance of 4 feet, and the chimneys have been treated with similar projections. The western corner of the building, which will be partially seen from George IV. Bridge, is finished off with a small hexagonal tower corbelled out from the wall as in the case of the windows. As to the interior arrangements, the principal rooms will be in the topmost flat. These consist of a reading-room, the library, and a hall capable of accommodating 200 persons. The access is from Parliament House, and the entrance is in the west corner of the building into a large vestibule, facing which on entering, and occupying the western wing of the building, is the reading-room, measuring 26 feet by 30 feet. To the east of the reading-room, occupying the main part of the building, is the library, a large and effective room, measuring 67 feet by 38. It is divided into five bays on either side; and the bookcase blocks, instead of being furniture merely, are treated as part of the architectural design, each block being terminated by a wide pilaster towards the room, these being connected by a series of elliptical arches springing from boldly designed trusses. The room is lighted from the four sides, this being attained by the side wings being kept low. Abundance of light is also obtained from the large cove in the ceiling of the room; and, with regard to the roof-lights, the architect proposes a series of double windows—an outer and an inner—the inner of tinted glass, so as to temper the lighting and prevent draughts. At the east end of the library are the lavatories and the librarian's room, communicating by a spiral stair with the book-stores in the flat below. In the eastern wing is the hall, entered from the vestibule by a separate corridor. A stair from the vestibule leads to the flat below, where there are four consulting-rooms, provision for heating, and book-stores, which, with the library, will accommodate 70,000 volumes. A fireproof floor separates this flat from the model dwellings beneath. These are designed for kitchen, room, and two bed coves, and each has its own sanitary arrangements. Special care, indeed, has been bestowed on the sanitary arrangements of the building, the system adopted being known as the "sectional" system, the drainage from the library portion of the building being entirely separated from that of the tenements beneath so as to decrease the number of ventilating pipes. Similar care has been shown in the treatment of the ventilating arrangements. A ventilating shaft runs the entire length of the library premises, and the vitiated air will be extracted by a Boyle's air-pump ventilator. At night Strode's ventilating sunlights have been proposed as a help to extracting the vitiated air. The estimated cost of the design is stated to be 13,000*l.*

#### THE CHURCH HOUSE.

ON Saturday a meeting of the general committee of the Church House was held in the rooms of the National Society, Broad Sanctuary, Westminster, for the purpose of receiving the final report of the executive committee. The Archbishop of Canterbury presided.

The Archbishop of Canterbury stated that their gathering represented the last meeting of a committee which had met but once before. The executive committee, which had been entrusted with full powers, had spared no labour necessary, and the general committee was now asked to receive the report. It was hoped that a fortnight later the Church House would be launched and would fulfil all expectations, in being a perpetually growing institution of perpetually increasing usefulness.

The Rev. R. M. Blakiston then read the report of the executive committee, which stated that the two sub-committees—one of sites and works and the other of finance—had been appointed, with the Duke of Westminster as chairman of the former, and the Bishop of London of the latter. A site had been chosen on the south side of Dean's Yard, comprising all the houses on the terrace, except Nos. 6, 7, and 8 (the acquisition of which was still under consideration), with all the land behind bounded by Tufton Street, Little Smith Street, and Great Smith Street. The right of purchase of the freehold of this site for the sum of 26,500*l.* had been secured. The property was held on long leases in five separate holdings. Negotiations for the purchase of the leasehold interest of some of this property had been entered into, and in some cases completed; while immediate possession of No. 10 Dean's Yard had been obtained, and a similar arrangement concerning No. 11 was on the point of completion. For the perpetual holding and management of the property the executive committee had presented a petition



for a charter of incorporation, and this had been granted on February 23, 1888. The receipts up to June 30 amounted to 45,853*l.*, while a balance of 2,681*l.* remained at the bankers, besides investments and deposits to the sum of 35,868*l.* The total liabilities incurred, and to be incurred, in purchase of the site amounted to 42,431*l.*, of which 3,146*l.* had already been discharged. The present resources of the corporation were amply sufficient to provide for these commitments. On the completion of the purchases the rents to be received would amount to 963*l.* per annum.

The Bishop of London, in moving the adoption of the report, said that he thought it would be well for the corporation to put themselves in entire legal possession of the freehold of the selected site and also of certain parts of the leasehold interest as soon as possible. There was one house which they were about to occupy immediately, and in which some of the most important committees of the Lambeth Conference would find accommodation. The site was convenient, and the conditions of obtaining it were also especially advantageous. What was now required was that persons all over England interested in the Church should become members of the corporation and each pay the guinea annual subscription.

Lord Stanhope, in seconding the adoption of the report, said that the charter having been obtained, the next consideration was that of building, and he hoped that very soon it would be possible to lay the foundation-stone of a block of buildings which would be worthy of the scheme.

The report was unanimously adopted.

The Rev. R. M. Blakiston announced that the inaugural ceremony would be held on the 21st inst., immediately after the afternoon service at Westminster Abbey. All members of the corporation and subscribers would receive tickets of admission, but, as it was probable that the available space would not thus be exhausted, cards would be issued to the general public on application at No. 2 or 10 Dean's Yard.

## TESSERÆ.

### Architecture and Subsidiary Arts.

SIR M. D. WYATT.

I DO most sincerely hope that the preliminary practice of contemplating a building as it should be in its complete form, with its architecture, sculpture, and painting united, which I find obtained universally for so many centuries in Italy, may become a constant practice among us also. I cannot but think that, in the history of the world, there has scarcely been known a country that has reached the pitch of civilisation at which we have arrived which has studied the arts in so isolated and, I may also say, accidental a manner. If architects would only think a little more of the power of decoration and illustration by means of colour, I submit that they would not only build more effectively but more economically (since it must ever be remembered that a large flat surface is one that best of all admits of ornament); and by introducing their ornament in relief sparingly and in the right points they would be enabled to accentuate and emphasise the points to be enforced, and to which the eye should be attracted, and to leave in quietude those which should tranquillise the vision, and lead to increased appreciation of the more salient points.

### Imitation in Architecture.

R. P. KNIGHT.

The fundamental error of imitators in all arts is, that they servilely copy the effects which they see produced instead of studying and adopting the principles which guided the original artists in producing them; wherefore they disregard all those local, temporary, or accidental circumstances upon which their propriety or impropriety, their congruity or incongruity, wholly depend: for principles in art are no other than the trains of ideas, which arise in the mind of the artist out of a just and adequate consideration of all such circumstances, and direct him in adapting his work to the purposes for which it is intended: consequently, if either those circumstances or purposes change, his ideas must change with them, or his principles will be false and his works incongruous. Grecian temples, Gothic abbeys, and feudal castles were all well adapted to their respective uses, circumstances, and situations: the distribution of the parts subservient to the purposes of the whole, and the ornaments and decorations suited to the character of the parts, and to the manners, habits, and employments of the persons who were to occupy them: but the house of an English nobleman of the eighteenth or nineteenth century is neither a Grecian temple, a Gothic abbey, nor a feudal castle; and if the style of distribution or decoration of either be employed in it, such changes and modifications should be admitted as may adapt it to existing circumstances; otherwise the scale of its exactitude becomes that of its incongruity, and the deviation from principle proportioned to the fidelity of

imitation. Common practitioners think every objection answered when some respectable authority is adduced; though perhaps the only point proved by such authority is that the person who uses it does not understand it, or know how to apply it.

### Greek Wall-Painting.

J. J. HITTORFF.

That the use of this species of decoration had been general in Greece will be evident on considering the porticoes of Athens, Olympia, and Delphi, where Polygnotus, Euphranor, and Micon, in depicting the exploits of the heroes of their country, excited their compatriots to imitate their warlike virtues; the Curia, in which Protogenes and Olbiades painted the images of legislators; the theatres and Odeia, decorated with the portraits of poets and the representation of the Graces, their inseparable companions; the Gymnasia, offering to the regard of the spectators the god-like conquerors in the contests of Mars and of the Muses; the Propylæ, more famous for the precious works of the painter than for the marbles with which they were covered; the palaces, houses, and tombs—in which latter historical painting on the wall formed the principal ornament; and lastly, the temples, as in Athens alone, those of Theseus, Erechtheus, Bacchus, Esculapius, and the Dioscuri—the paintings of which were all significant, and in accordance with the places and divinities. We must not, however, confound this characteristic system, common to all the epochs of art in Greece, and which dates back to Egypt, with the no less ancient and general custom of suspending wooden tablets in the sacred edifices to serve as offerings. The most ancient examples of painting on the wall were executed in Italy, as in the Temple of Juno at Ardea; in that of Cæra, of a more remote antiquity; and in that of Lanuvium, where Caligula endeavoured in vain to detach them from the wall, and take them from the ruined temple which they had decorated. Painting in mosaic, whether in the manner of the ancient basilicas, or of the works of the Renaissance, must necessarily have been a tradition of this usage. As to the subject and composition of their paintings, it must be observed that in vase painting, and other decorations of the Greeks, the subjects were often copies of celebrated works, and, therefore, necessarily give a most exact idea of their character and effect. The buckler of Pyrrhus was placed above the doorway of the Temple of Ceres in Argos, and movable portraits were suspended above the mural paintings of Polygnotus in the building contiguous to the Propylæa.

### Roman Road Construction.

A. THOMSON.

We possess original accounts of the Roman mode of constructing roads from two very different sources—the one from the architect Vitruvius, and the other from the poet Statius. The architect gives us clear and distinct specifications, which no contractor could mistake; while the poet describes the busy scene so vividly, that we cannot fail to realise it in all its details. The passage of Vitruvius to which we refer is the first chapter of his seventh book, which is entitled "De Ruderationibus." I know no English word which exactly translates the Latin *rudratio*. It means, as sufficiently appears from the description given, the placing of materials of all sorts so as to prepare a solid and secure resting-place for the superincumbent structure, whether that might be the wall of a house, a floor, a pavement, or a roadway. The object of Vitruvius in writing the chapter evidently is to give rules for ruderation, without regard to the structure which was to be raised upon it, only distinguishing in one part betwixt out-of-door and in-door work; and it might be read without being aware of its application to road-making, did not the remains of ancient viæ show us that their lower strata are formed precisely in the manner he prescribes; and his specifications for each part of the work are so distinct, that they might be carried into execution without difficulty at the present day. The general mode of proceeding, both as enjoined by Vitruvius and as described by Statius, was the following:—The road was lined out as straight as possible, and the width marked by a trench at each side. The next step was to remove the whole of the soil betwixt the trenches to the full depth of the road. If the ground at the bottom was found to be firm and solid, the surface of it was levelled, and the work proceeded—"quærat solum si sit perpetuo solidum et ita exæquatur;" but if not then piles were driven to secure it—"si autem omnis aut ex parte congestus locus fuerit fistucationibus cum magna cura solidetur." Thus a place was prepared to receive the mass of materials which formed the body of the road; this was termed the *gremium*, and the whole purpose of it was to prepare a suitable and durable bed for the upper surface—the pavement or roadway. The *gremium* consisted of three distinct parts—the lowest being the *statumen*, the middle the *rudus*, and the uppermost the *nucleus*. The statumen varied in depth according to circumstances. It was laid upon the surface of the bed of the road, whether the



natural soil or the tops of the piles, and was composed of rough hard stones, not one of which was to be smaller than to fill the hand. The ordinary depth, as seen in sections, seems to have been from 12 to 18 inches. On the statumen was placed the rudus, a mass of small broken stones mixed with lime water, thoroughly beat together and smoothed, and when finished not less than 9 inches thick. Isidorus thus explains what the rudus was:—"Workmen call broken stones mixed with lime poured over them in constructing pavements, the rudus." Vitruvius gives distinct directions for preparing and finishing it. The lime mortar was to be in the proportion of one-third if the materials were new, and of two-fifths if they were old. And after it was laid on, it was levelled and thoroughly beat together by parties of ten men, with heavy wooden mallets, till brought to the thickness of 9 inches, and levelled. Above the rudus came the nucleus. It was a layer of broken bricks, tiles, and pottery, with the addition of a third part of lime mortar, and having, when finished, a depth of 6 inches. Such were the careful preparations to form a suitable bed for the roadway. The roadway itself, in the best roads, was formed of blocks of basalt, the ancient silex (and modern selce), carefully laid by rule and level. These blocks were of various sizes, but usually from 9 to 12 inches deep, and the sides cut into polygons, and so closely fitted together that a newly-made road appeared to be of one stone. This most durable material occurs in many parts of the Campagna, as noticed in a former paper. On each side of a complete road was a footpath raised above the level of the roadway, sometimes paved like the road, sometimes only covered with gravel (*glareâ*), but in either case having a carefully placed margin of stones, termed *gomphi*. The centre of the roadway, the agger, stood higher than the sides, in order that the water might easily flow from it. It is very obvious that roads constructed as now described must have been most durable, and Vitruvius concludes his chapter by asserting that when the foundations have been thus made, they will not soon go out of repair.

#### The Kosciusko Monument.

T. WUNDT.

The method, peculiar to the Slavonic nations, of erecting a hill to the memory of their great men, deserves, in many respects, the preference above our statues, on which our age has squandered so much pious coquetry and sentimental beggary. These natural monuments have not only a duration that defies the elements, and every variety of taste and form, but they are more truly national, inasmuch as they annex in the most simple manner the memory of a great man to popular tradition. The people themselves undertake the work of the artist. In the erection of the Kosciusko monument the whole nation co-operated in the most affecting manner. As soon as the work was resolved upon, at the proposal of Vincent Monkolski, the president of the Civil and Military Tribunal, all, without deference of rank or sex, hastened to offer their assistance. Ladies of noble birth took the spade in their tender hands, and the poor journeyman worked by the side of the proud countess, weeping for her country. Mothers led their ungrown children to take part in the last honours rendered to him, whom all Poles look upon as their father. Old and young, the senator, the warrior, and the peasant, dug together; and even a magnanimous foe, the Emperor Alexander of Russia, with those noble feelings that distinguished him, sent a considerable subscription. Thus the Mogila Kosciusko gradually arose, the earth was sent from all the different provinces, nay, it is said even from America, where Kosciusko began his martial career, and from Solothurn, in Switzerland, which had been the last asylum of the dying hero. The hill crowns the mountain of Bronislawa, so called after the daughter of one of the ancient Polish kings. The name is well suited to this patriotic monument, for it signifies the defender of renown.

#### Mediæval Treatment of Capitals.

W. P. GRIFFITH.

The crypt of Rochester Cathedral contains Norman capitals. Each has a square abacus, 2 feet square and  $4\frac{1}{2}$  inches in depth, and beneath it an ovolo and an astragal or bead; it resembles the capital of the Tuscan order. The piers opposite to these columns have each a similar abacus, with a channel beneath it  $\frac{3}{8}$ -inch deep, and then a cavetto 2 inches deep. This is often used as a string-course. The next kind of capital, which is common, is a modification of the Doric. It has a chamfered fillet on the top, and the original broad flat abacus and ovolo are united; the angles being rounded off form an escalop edge, and under the whole is a bead. Some writers describe the form of this capital as an inverted cone, cut to present four flat sides or faces. By channeling the conical mass a series of escalops are formed, and the spaces below them are sculptured to resemble inverted and truncated semicones. Some of the pier-caps in St. Bartholomew's the Great, London, have six semicones. Of the Norman voluted capitals (after the Ionic) there are many kinds, varying from extreme simplicity, as seen in examples in

Canterbury Cathedral, and in the crypt of Lastingham Church, Yorkshire, to elaborate enrichment, as in St. Peter's Church, Northampton. Adaptations to a certain extent of the Corinthian capital are seen in several of our cathedrals and churches, as well as in those on the Continent. There are other examples of capitals charged with sculptured representations of human figures, animals, foliage, &c., which thus resemble many capitals in the old churches of Normandy. In Late Norman and Early English capitals the foliage is arranged vertically round the bell. In Decorated capitals the foliage flows horizontally. Perpendicular foliated capitals are not common. Small leaves or pateræ are more frequently set at intervals round the shaft above the neck. But the vine and the strawberry leaf are sometimes found, though very differently worked from the deep overhanging foliage of the earlier styles, and forming only a shallow surface ornament. The dog-tooth, the nail-head, the ball-flower, and other ornamental mouldings sometimes occur in capitals, as well as crests of the Tudor flower, or of minute battlements in the later buildings. Even angels' heads with spread wings are found, as in the belfry-arch of Great Shelford, near Cambridge, and in the choir of Wingfield Church, Suffolk. Occasionally (in Norman work commonly) some subject is grotesquely sculptured below the abacus. Of this there is a very curious example at West Keal, Lincolnshire; or a subject is intermixed with the foliage, as in some Early English capitals in the south transept and the north porch of Wells Cathedral. Although there are many beauties in Mediæval architecture, there are also faults. In Pugin's "Gothic Ornaments," plate 86 shows some stone capitals in the entrance to the great hall, Kenilworth Castle; the central one is decorated with the foliage and fruit of the oak; the end of the stem ought to have been hidden, but it is a conspicuous object in the upper part of the capital, and the foliage is growing downwards.

#### Architecture and Engineering.

W. J. M. RANKINE.

In former times, before the division of labour had been carried to the extent which it has since reached, the professions of architect and engineer, and of military as well as civil engineer, were almost always combined in the same man. As an example of ancient date we may take the case of Apollodorus, the architect and engineer of the good Emperor Trajan, who flourished about the end of the first century of the Christian era. As an architect Apollodorus designed many splendid edifices, of which some remains still exist, such as Trajan's pillar, the triumphal arches of Benevento and Ancona, and other buildings. As a civil engineer he planned and executed, amongst other works, the famous harbour of Ancona, and a great bridge across the Danube. That he was also a military engineer is proved by his treatise, still extant, upon engines of war. The most illustrious example of the same kind in more modern ages was Michael Angelo Buonarrotti, who, together with his genius as an architect, sculptor, painter, and poet, possessed consummate skill as an engineer, both civil and military, and in the latter capacity was of eminent service in the defence of Florence. But in later times the subdivision of professions has drawn a line between architects and engineers properly speaking; and when an engineer, as on the present occasion, has to make remarks on architecture, he cannot lay claim to understand professionally more than the physical and mechanical part of the subject. So far as architecture is one of the poetical or fine arts, his knowledge of it can only be that of one of the general public. So far as engineering and architecture consist in applying the science of mechanics to the art of construction, the knowledge required by an architect and that required by an engineer are almost identical. Each of them should understand all those general principles, and all those special properties of materials, upon which depend the three great requisites of an efficient and durable structure—stability, strength, and economy. Stability, that the parts of which the structure is composed may retain their proper positions; strength, that each separate part may be in no danger of breaking under the forces applied to it; and economy, that neither materials nor work may be expended without contributing to the object of the structure. Stability of position depends on the figures and arrangement of the parts of which the structure consists, and the distribution of the load which they have to bear, whether from their own weight or from external pressures; and the principles by which it is regulated form a branch of the science of statics. The civil engineer must understand them, that he may know how to design a wall that shall sustain the pressure of a bank of earth, or a reservoir of water, or a chimney that shall safely bear the force of a storm; how to determine the figure of a tunnel that shall keep its shape at a great depth under ground; the form and properties of the arches and piers of a viaduct of stone or brick; the dimensions and arrangement of the beams of a timber viaduct, or of the bars and plates of one made of iron. The architect has to apply the principles of stability almost exactly to the same extent and in the same way to buildings in masonry, and framework of timber and metals.









T. LOCKE WORTHINGTON, DEL.

INK-PHOTO, SPRAGUE & CO LONDON

CAPITAL, NORTH SIDE, ARCADE, CHAPTER HOUSE, SOUTHWELL CATHEDRAL.









*All rights reserved.*

THE REVERIE  
(BEFORE THE PO  
FROM THE PAINT



g 13<sup>th</sup> 1888.



"INK PHOTO" SPRAGUE & CO., 22, MARTINS LANE, CANNON ST., LONDON, E.C.

PE PAUL III  
(MARTIN LUTHER)  
T. VRIENDT



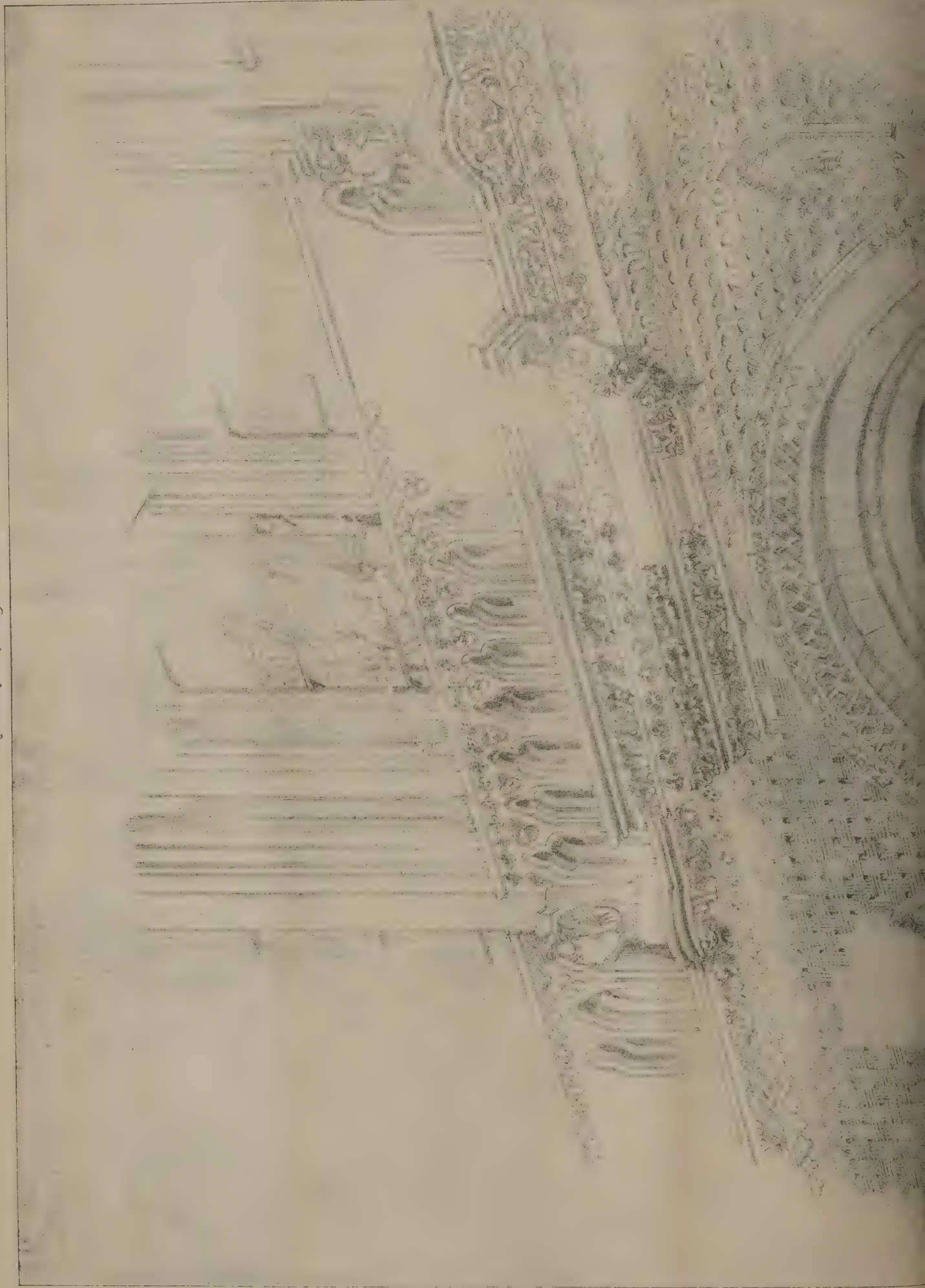




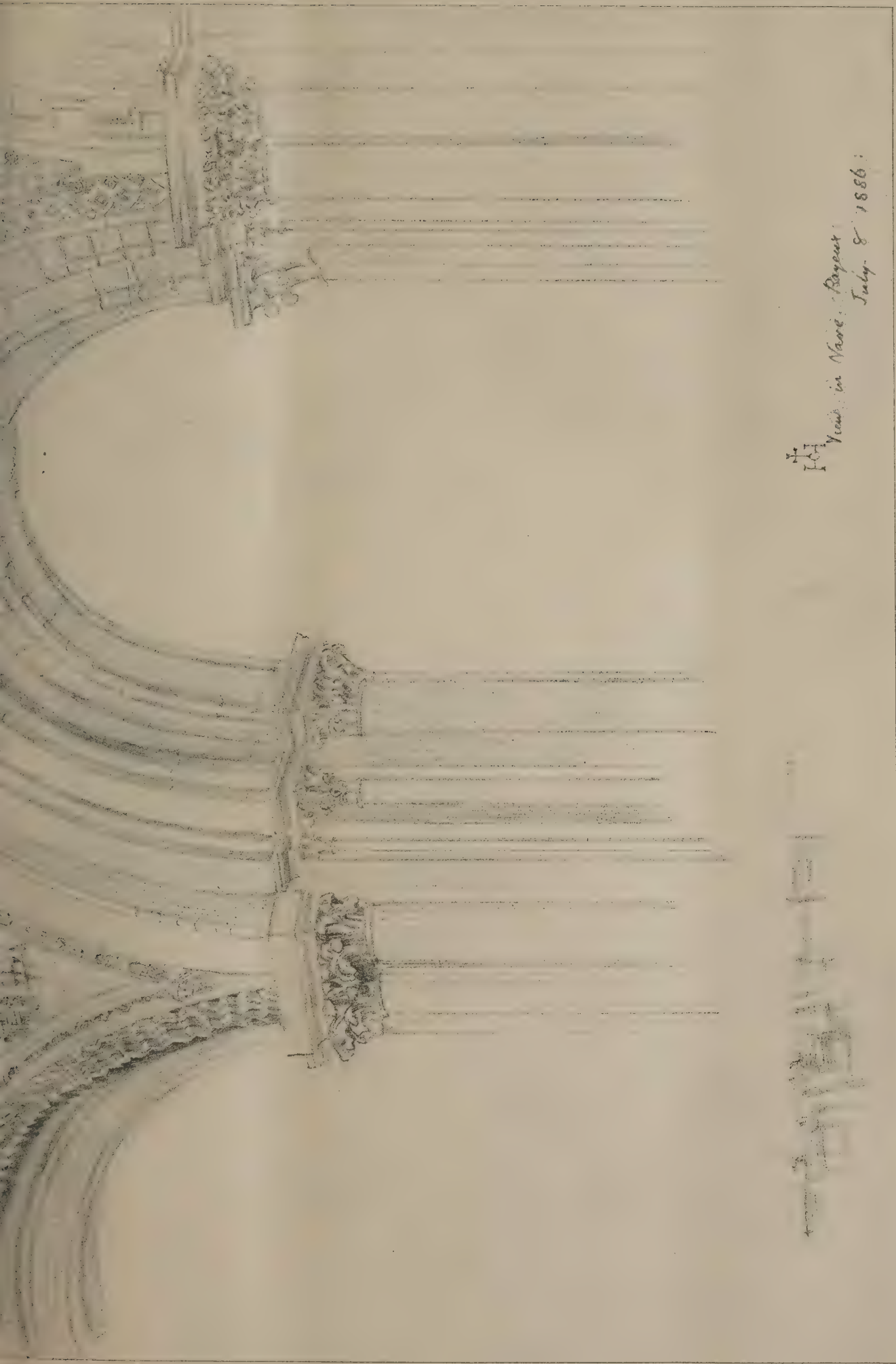




The Architect, July 13<sup>th</sup> 1888.







View in Nave, Bayeux  
July 8 1886

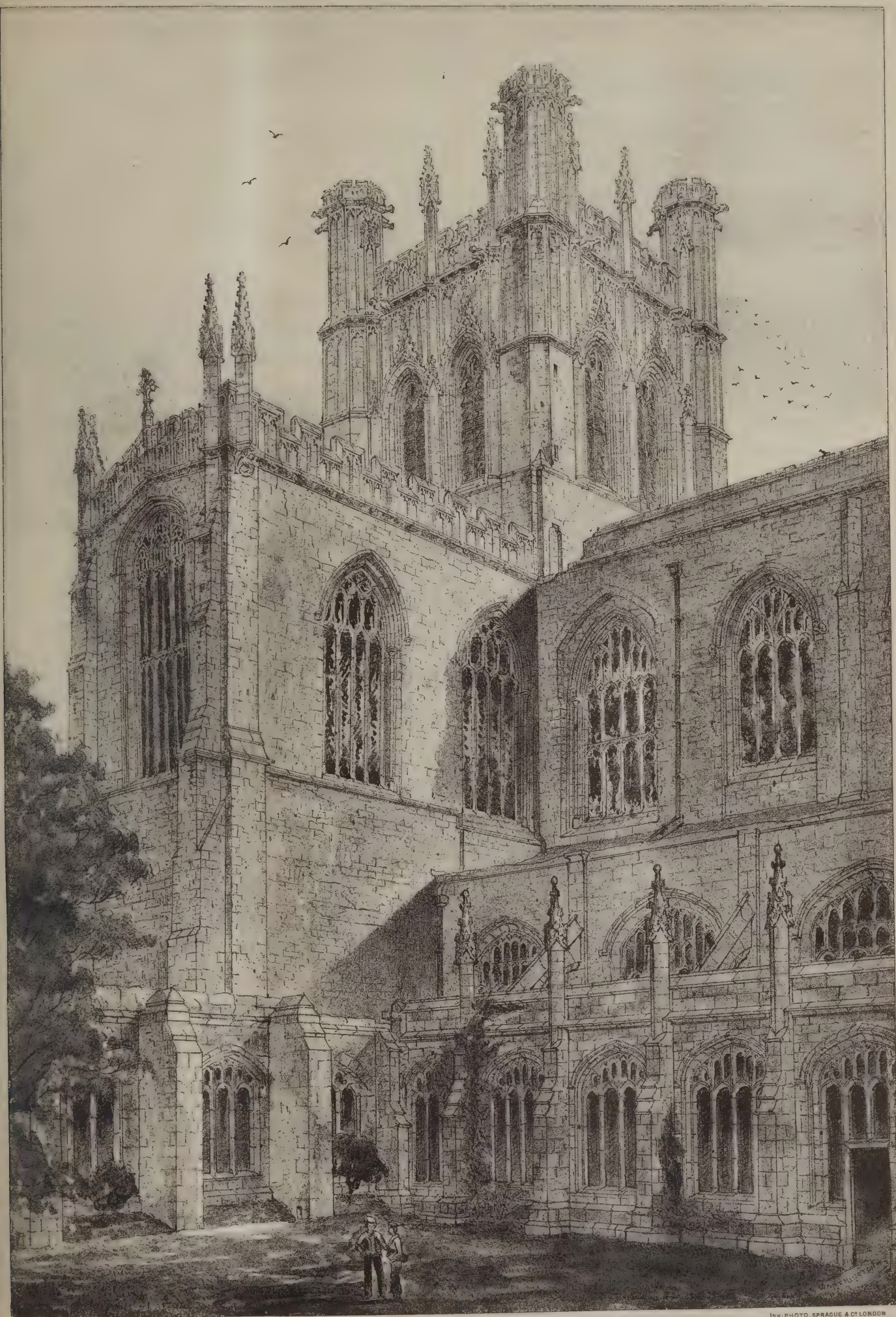
DRAWN BY GERALD HORSLEY.

INK PHOTO, SPRAGUE & CO. 22, MARTIN LANE, LONDON, E.C.





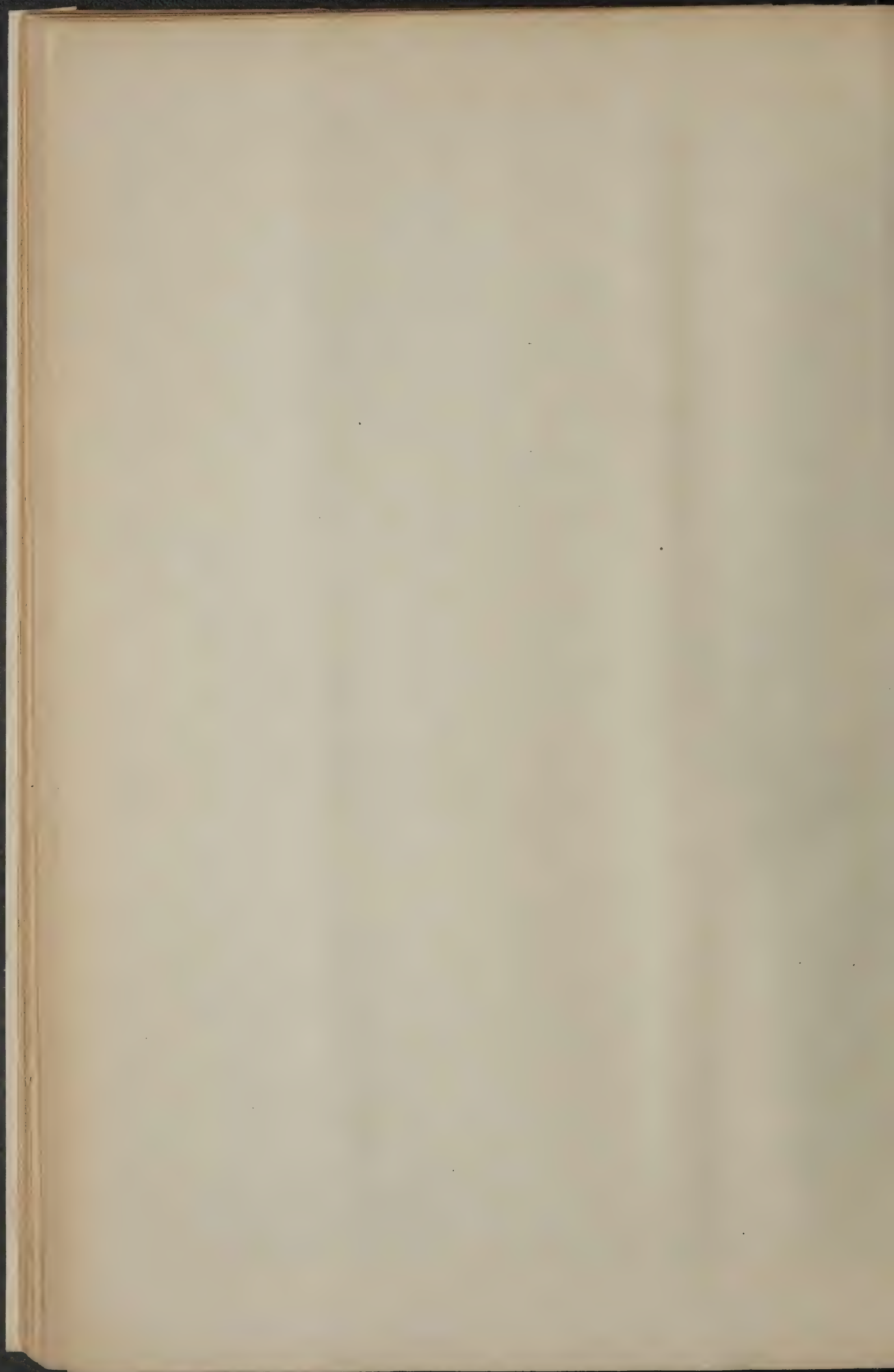




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CHESTER CATHEDRAL.







## ILLUSTRATIONS.

THE REVERIE OF POPE PAUL III.

**S**PECULATORS on what might have been if certain events had occurred point to the case of Pope PAUL III. If he could have secured the majority of votes when his predecessor was elected, it is supposed that the Reformation movement would not have attained so much force. For both as Cardinal and Pope, ALESSANDRO FARNESE manifested a desire for reform, and if political complications had not baulked him, he must have been more successful. It is not, therefore, to be supposed that in the incident depicted by M. ALBRECHT DE VRIENDT the Pope is inimical towards MARTIN LUTHER, whose portrait is before His Holiness's eyes. There is more reason for assuming that in his reverie PAUL III. was dreaming of a compromise, and if kings and emperors had not interfered, the Pope's dream might have been realised. The picture is one of several relating to that period which M. ALBRECHT DE VRIENDT has painted, and by them he has proved himself to be at the head of the Brussels school of historical painting.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 4.—NAVE, BAYEUX CATHEDRAL. [GERALD HORSLEY.]

CHESTER CATHEDRAL.

CAPITAL FROM SOUTHWELL CATHEDRAL.

**T**HESE plates are taken from the excellent collection of sketches by Mr. T. LOCKE WORTHINGTON, entitled "Remnants of Old English Architecture." The article on the volume is crushed out this week.

EDINBURGH ARCHITECTURAL  
ASSOCIATION.

**T**HE annual general meeting of the Edinburgh Architectural Association was held on the 5th inst. The Secretary submitted the annual report, which contained the record of a year of successful work by the Association. During the year the Association had added thirty-four members to its roll, while the withdrawals had been considerably less. The treasurer submitted the financial statement, which showed a balance in favour of the Association amounting to 146*l.*, compared with 170*l.* last year. It was explained, however, that there had been 36*l.* of extraordinary expenditure on account of the furnishing of the new hall and additions to the library, so that the Association was financially in as good a position as last year. Reports submitted on behalf of the Sketch-Book Committee and the Work Class Committee indicated continued success. In the work class there had been twenty-three students, whose work, and the quality of it, showed an advance on the previous year, and prizes gained at the class, and in connection with the sketch-book competition, were presented in the course of the evening. Professor Baldwin Brown was appointed president for the ensuing year; Mr. John Kinross and Mr. Archibald Macpherson, vice-presidents; Mr. T. A. Fairbairn, honorary secretary, and Mr. A. D. Fairbairn, treasurer. The president then delivered his closing address, in which he reviewed the work of the session. In speaking of the work classes, he pointed out how invaluable these were as a supplement to the work of the office; and he thought it was a matter of credit that with so little encouragement so much was being done, and so well. The number of students attending the classes was increasing, and they were a fit subject for special effort to secure external help for their endowment. The several professions in the city had each their centres of teaching, and he argued that the position which architecture held among the professions, and the effect of encouraging it in beautifying the city and making it more attractive, furnished a claim on a share of the surplus from the Exhibition profits. He asked that, before it was too late, a combined effort should be made to petition those who had the distribution of the fund, in the interests of the endowment of these classes. The other leading topic in the address was the subject of registration, and Mr. Blanc argued that the architect could not be brought to the level of test examination. There were, doubtless, minor qualities which went to make up the architect which could form the subject of academic test, but registration could not invest the constructor in the garb of an artist. Architecture should be free, if it would have a healthy, vigorous growth, and in that view it seemed unnatural to make it a close profession. In closing, Mr. Blanc spoke of

the greatness of the architect's profession, which had raised monuments which time itself seemed powerless to destroy. It was fortunate that the art was being fostered again under somewhat favoured conditions; for there was an increasing section of the community which had risen to a sense of healthy artistic feeling which was daily increasing. It was for them accordingly to enlarge that appreciation through the means of their profession.

## GLASGOW INSTITUTE OF ARCHITECTS.

**A** MEETING of this Institute was held in the Religious Institution Rooms on Monday. Mr. David Thomson, president, was in the chair. The President having in feeling terms referred to the death of Mr. James Salmon, I.A., F.R.I.B.A., which took place since last meeting, it was unanimously resolved to place on record the Institute's sense of the great loss thus sustained by it and also by the architectural profession of Glasgow, among whom the deceased was held in the highest estimation. Mr. Salmon was one of the originators of the Institute, took a leading part in its formation, and had all along taken a most lively interest in its proceedings. The Institute has been much indebted to him not only for its formation, but also for much of the success it has achieved. Mr. Salmon has been continuously a member of Council, and he was the first President, and held office for two years. The secretary was instructed to send an excerpt from this minute to Mr. W. F. Salmon, in order to convey to the late Mr. Salmon's family their deep sympathy with them in their time of sorrow.

## DECORATION IN ENGLAND.\*

**A**LL decoration belongs properly to the painter or the sculptor, though it is more often than not done by the architect, but it is no part of his art, though by an extension of meaning a building is sometimes said to be decorated with mouldings. Architecture has its own work and its own laws, as well as others that belong to the arts generally, such as invention. Perhaps the greatest distinguishing mark of architecture as a fine art is to express with æsthetic propriety the destination of the structure, by arousing thoughts proper to that destination; it has to make the whole rhythmical and harmonically proportioned, to give variety and contrast by different shapes, and by different degrees, sizes, and shapes of shade and shadow, to give an appropriate outline, and, where the structure is made up of different parts in different places, to make the whole compose properly. The sculptor gives us the beautiful forms he sees in nature, and mostly those in organic nature, or the beautiful forms he has collected or deduced from nature, sometimes even those that have but a momentary existence, though, like the written word, sculpture is permanent, and except to show his skill or mastery in his art, the subject should be in repose. Sometimes, however, he has to reproduce evanescent expressions and actions, as smiling, frowning, laughing, crying, &c., and running, wrestling, boxing, quoit-playing, javelin-throwing, riding, driving, or swimming, a moving procession, or a battle; and in portraits he has to give us the individual lineaments, features, and the habitual expression with truth, though he does well to emphasise the nobler traits. I think I may say what we ask of him is to give us beauty of form in a permanent material, or to raise noble emotions in our souls, and to truthfully portray the form and lineaments of those we love, admire, or venerate. Though we mostly only ask for the natural shape, we do not deny him the use of drapery when that is noble or beautiful in form. But we do not ask the true sculptor to give us that which is not beautiful or ennobling merely because it may some day be archæologically interesting, like the Highlander at the snuff shop.

Painting, as far as form goes, is merely sculpture from one point of view, and what is said of the former may be equally said of the latter. What we ask of the painter is beauty of colour, or colour that arouses noble emotions; or in the case of portraiture, that which represents the actual facts; and when sculpture is not painted, as is mostly the case in statuary, painting can give atmospheric effects denied to statuary and unpainted sculpture.

If our own history is so bare of subjects that are worthy to be painted or sculptured, or the people are so ugly and badly dressed that it is merely ridiculous to portray them, we have the whole of the Scriptures at hand for the adornment of our churches, chapels, and cathedrals, and these have plenty of empty niches for statues, vacant pedestals for groups, pediments for reliefs, and covered porticoes for pictures in mosaic, without speaking of their interiors. Means in the shape of money are plentiful, nor is there a lack of artists, nor a difficulty in obtaining the requisite materials.

\* From the first Cantor lecture, by Mr. G. Aitchison, A.R.A.



The same sort of compliment might be paid to this generation that one of the Greek kings paid to a soldier. He said, "He was like a sword-fish; he had a sword, but no heart."

We are a nation of sailors, and for some of our public buildings a depiction of sea-fights or even of fleets of merchantmen would not be amiss; and if the grim ironclad, like a black porpoise, is felt to be wanting in picturesqueness, the curved prow, high stern, and swelling sails of early ships have always been a favourite subject with artists. Besides, if we have not stirring episodes enough in our own history for enriching public buildings, we can fall back on our own poets.

It may at first be thought that there are the fewest resources for houses, yet most persons, even if their whole life has been occupied in respectable plodding for gain, have at least had some episodes in the history of their family that are fit for sculpture or painting. There are incidents, too, in each man's calling which can be portrayed, not to speak of the whole of the poetry of the world.

Lord Beaconsfield said, "Adventures are to the adventurous," and the pith of this remark may be applied to picturesque or sculptural subjects, as well as to poetic ones. M. Van Haanen, at Venice, saw that stringing beads was a picturesque subject, and being a fine painter, made a splendid picture of it. I was once in a lace mill at Nottingham; the room, with the girls cutting up the lace, would have made an equally good picture had I happened to be a fine painter. In the most prosaic age there is stuff enough for poetry; in the most tasteless age there is beauty enough for fine pictures and sculpture, if there were poets, painters, or sculptors to appreciate and properly execute the beautiful things they hear or see; though we can hardly expect executants where there are no admirers. You all recollect Hogarth's etching of the hogs routing in the dunghill, while a celestial choir is singing above.

But even if these are not enough, there is the whole of nature before you. Wild beast patterns are favourite subjects in the East for pottery, carpets, stuffs, and hangings. You must have a cat, a dog, or a canary bird. You have horses and sparrows before you, and not unfrequently, even in London, you may be visited by a pigeon, or a robin, if you put crumbs on your window-sill; and if you do not care for these, you can have medallions of your own head and of those of your family joined in a band of formal ornament. This would be a great improvement to a wall with holes in it of common brick.

What may be called formal ornament is the application of certain observed facts in nature that please. Up to a certain point the repetition of some simple form is pleasing; lines are said to be divided harmonically when they have certain ratios to one another, and spaces may have similar proportions, and these as well as certain curves give more pleasure than others; the combination of some flat and sharp curves is also found to be beautiful; the contrast of certain forms and of certain colours also gives pleasure. It is the evolution by man of these observations properly applied to things he wants that makes them ornamental, and their superposition on elegant forms is said to decorate them.

Mr. W. Morris once said, "People nowadays do not want what is beautiful, but what is new." This, however, is not wholly true, for people really want what is beautiful, as well as what is new. They know what is new, but they do not know what is beautiful, and make the mistake of accepting the new which they do know, instead of taking the old which is beautiful, when they cannot get both.

The number of creators in every art or science is small. I might say that great creators are scarcer than diamonds. We all feel that we are greatly in want of inventors and discoverers in every art and science. I will put a case that comes home to everyone in medicine. A great deal has been done in the present day in preventing illness. If we could get an instrument that bore the same ratio to the microscope as this does to the human eye, it is quite possible a great stride would be made in medicine, and every sick person would be a gainer.

The thing is to find your genius, and to make it worth his while to invent what you want; you must first know what you do want, and then you must honour and reward the inventor. A healthy, vigorous and virtuous population, with high aims, is the most likely stratum from which a genius may come; he then wants the opportunity of cultivating his powers in the right direction, and when he has invented, rewards in the shape of general esteem and honours, and, as often as not, in wealth. Though Socrates and Diogenes scorned wealth, Plato and Aristotle did not; and we all know Plato's answer to Diogenes, who said, when stamping on his purple carpets, "Thus do I trample on the pride of Plato." If you make it easy for every rascal to steal his invention, and deprive him of his labour, you do all that in you lies to discourage invention, and this is as true of ornament as of everything else. I believe in the great days of ornamental invention the ornamentalist was highly rewarded, both in wealth and honour. Nowadays, the man who finds the wool, the clay, the cotton, or the wood, or buys the machinery, or packs the goods, or what not, gets all the advantage, and he who confers its value

on the article almost nothing. I heard of a designer who sold for three guineas a design that took. The manufacturer gave up the manufacture of everything but that article for some years, and probably made his fortune, but he never gave the designer an extra sixpence. I think the leading idea of many manufacturers is how to steal a design. Had not Carlyle got some able man to negotiate for him he would have died a pauper, and all the profit of his works would have gone to the publisher.

Almost all our best patterns have come from the East, and I know that there the designer is highly paid, and gets a heavy royalty on every piece that is woven or embroidered from his design.

In the story of Alee-shér and Zumurrud, Zumurrud had probably learned the design by heart, but the embroidering alone was well paid for. She gives Alee three pieces of gold to get their food and drink for the day, and for a piece of silk, and she directs him to get "as much as will suffice for a curtain, and buy gold and silver thread and silk of seven different colours. . . . The damsel took the curtain, and embroidered it with coloured silks, and ornamented it with gold and silver thread; she worked a border to it with the figures of birds, and represented around it the figures of wild beasts, and there was not a wild beast in the world that she omitted to portray upon it. She continued working upon it for eight days, and when it was finished she cut it and glazed it, and gave it to her master, saying, 'Sell it for fifty pieces of gold.' If we allow two pieces for the stuff, the silks, and gold and silver thread, she got six pieces of gold a day. Even if we took gold at its present value, though it has enormously diminished in value, it is three guineas a day, which cannot be considered a bad professional income for an embroideress, even if she furnished the design.

There is one more subject I want to touch on, the value of old work. The older the work is, as a rule, the more likely is it to be good, for the less good things have perished by the way. Some one illustrated this effect of time by comparing it to a man who went to settle in the backwoods with a large library. The farther he got from the tracks of civilisation the harder and more expensive he found it to carry many books, so he gradually threw them away, till on his arrival at his destination he had only half a dozen, and these, of course, were those he considered the most perfect, and which he set the most store by. Each epoch that had high aims, superior people with great skill in their art, much competition and able critics, naturally produced the best works; in after times those who practised the same art highly valued work that was better than they could do.

That which is the most perfect in ornament is the work of people gifted with high artistic fibre and faultless execution, to whom nature appeals in her masterpieces, who assimilate some of the matchless grace they see in a flower, in the turn of a leaf, in the curves that mark the growth of a creeper, in the wing of a bird, the curve of a lizard, or the knots or spirals of a serpent; who can so arrange these forms as to perfectly satisfy the cultivated eye, and keep them subordinated to the containing lines; such things may be seen in examples of Greek and Tuscan, or rather North Italian, ornament. This sort of ornament by some mishap has got christened Conventional, which has no meaning as applied to ornament, and should rather be called Abstracted.

Colour is another species of ornament that, like form, has doubtless its laws, though, as yet, neither have been discovered, and we call form and colour, like medicine, empirical arts. We observe that the collocation of certain spaces, or masses of certain colours, give us more pleasure than others, and we try and recollect these collocations if we deal in colour, and use them when we have occasion.

It has been observed that the primaries that are complementary—i.e., whose mixture produces white—go well together, and that certain secondaries and tertiaries set off primary colours. Chevreul found that the saturation of the eye with a colour caused it to see the complementary colour if a white surface was looked on. Every one knows this from Pears's advertisements. And Chevreul also found out that if we looked at another colour, it was modified by the complementary colour of the first. He wrote a long book about it, mainly consisting of examples of this one observation.

There is little else to say, except that when a full or deep scheme of colour is settled on white must be used sparingly, like a jewel, and that when a light scheme is used black has the same value, and that all pure colours if used on a white or very light ground must be pulverised—i.e., used in minute particles, or very light tones only be adopted. Aristotle remarks (*Politics*, Lib. 4, cap. 7) that the inhabitants of Europe, "while full of spirit are comparatively deficient in intelligence and artistic skill"; while "the nations of Asia, on the other hand, although intellectual and artistic, are wanting in spirit." This is still true for colour only, for the reproduction or invention of exquisite form is now the prerogative of Europe, and of those Europeans who have colonised other parts of the globe. The



products of Asiatic looms and potteries are to be studied for magnificence, beauty, and exquisiteness of colour, as well as the works of nature. As a penance it may occasionally do us good to be surrounded with ugly forms and discordant colours, to pass an hour or two in the parrot house of the Zoological Gardens, to cover ourselves with ashes, and to eat nauseous food. But to condemn ourselves to this perpetually is not to acquire virtue, but to brutalise ourselves, and to throw away the good gifts the Almighty has provided for us.

### ROYAL ACADEMY ARCHITECTURAL SCHOOL.

THE following students have been admitted to the Architectural School:—

*Students' Upper School.*—T. D. Bedford, T. Davison, W. M. Duke, C. S. Haywood, W. F. Horton, H. P. Lanchester, F. C. Ryde, C. S. Spooner, and F. J. Verity.

*Students.*—T. C. Agutter, C. J. Blomfield, L. C. Cornford, A. Mackintosh, E. A. Rickards, W. J. W. Roome, W. Sheen, J. C. Watt, and E. J. A. Wigram.

*Probationers.*—F. W. Bedford, D. J. Blow, W. A. Fenn, J. W. Little, J. G. Oakley, J. Paxton, A. M. Poynter, J. Rawlinson, F. E. Smee, E. W. M. Wonnacott, and P. S. Worthington.

### FOREIGN MUSEUMS.

A RETURN has been presented to the House of Commons showing the hours of opening, organisation of staff, and conditions of admission on Sundays in summer and winter in the national and municipal museums, galleries, and collections of the cities of Paris, Berlin, Amsterdam, New York, and Philadelphia.

#### Paris.

The hours of opening of the principal public galleries owned by the State or Municipality in Paris and the neighbourhood are stated in the following table:—

1. Museums, &c., under the Direction des Musées Nationaux (Ministry of Beaux-Arts):—

Louvre . . . . .	April 1 to October 1, 9 to 5 daily.
Luxembourg . . . . .	October 1 to April 1, 10 to 4 daily.
Versailles . . . . .	Sundays all the year round, 10 to 4.
St.-Germain . . . . .	Closed on Mondays for cleaning.

2. Museums under the Direction des Monuments Historiques (Ministry of Beaux-Arts):—

Cluny . . . . .	April 1 to October 1, 11 to 5 daily. October 1 to April 1, 11 to 4 daily. Closed on Mondays for cleaning.
Musée de Sculpture Comparée . . . . .	11 to 4 daily. Closed on Mondays for cleaning.

3. Museums, &c., under the Ministry of Public Instruction:—

Natural History collections . . . . .	1 to 4 daily, except Mondays.
(Jardin des Plantes)	
Ethnographical Museum . . . . .	Sundays, Mondays, and Thursdays, 12 to 4 (or 5 in summer).
(Trocadéro.)	

4. Museum under Ministry of War:—

Artillery Museum . . . . .	Tuesdays, Thursdays, and Sundays, 12 to 3 (or 4 in summer).
(Invalides)	

5. Museums, &c., under Municipality:—

Musée d'Auteuil (for plans, architectural drawings, &c.) . . . . .	Thursdays and Sundays, 1 to 4.
Musée Carnavalet (records illustrating history of Paris, and especially the French Revolution) . . . . .	Library daily on week-days, 10 to 4 (or 5 in summer), except a week at Easter, and from August 15 to October 1.

It will be seen that all these galleries and collections are open to the public on Sundays, and that when they are only open twice or three times a week, Sunday is always one of the open days.

The following is the staff of the four great collections which are placed under the Department des Musées Nationaux (Louvre, Luxembourg, Versailles, St.-Germain):—Nine conservators (220*l.* to 280*l.* a year), charged respectively with the departments in those collections (a) of marine; (b) of painting and drawing; (c) of Egyptian antiquities; (d) of Oriental antiquities; (e) works of art of the Middle Ages, Renaissance, and modern times; (f) ancient sculpture; and the general superintendence and maintenance of the collections (g) of the Luxembourg, (h) Versailles, (i) and St.-Germain. Five assistant conservators (at 100*l.* to 180*l.* a year), assigned to the departments of painting and drawing, Egyptian antiquities, Oriental antiquities, works of art of the Middle Ages, Renaissance, and modern times, and ancient sculpture. Eight attachés à la conservation (100*l.* to 160*l.* a year), two assigned to

the department of painting and drawing, and one to each of the departments of Egyptian antiquities, Oriental antiquities, and works of art of the Middle Ages, Renaissance and modern times, besides one specially assigned to the Luxembourg, Versailles, and St.-Germain respectively. One secretary (accountant), receiving 240*l.* a year, and one assistant secretary at 200*l.* His office is served by five clerks, at 72*l.* to 144*l.* a year. Three of these clerks belong strictly to the office, and two to the atelier, or workshop, for the sale of casts, &c. One secretary (accountant) for Versailles. One librarian (160*l.* a year), and an assistant librarian for the Louvre. The task of watching and keeping order in the galleries of the four great national museums is confided to a staff of 158 men, composed and paid as follows:—

2 chefs . . . . .	£80
5 sous-chefs . . . . .	74
17 brigadiers . . . . .	70
132 guardians (divided into four classes of 33 men each) . . . . .	54 to 66

Most of these are taken from lists of old non-commissioned officers submitted by the Minister of War. They are distributed among the four museums as required from time to time. Besides its own contingent, Versailles has also forty-four servants to help in watching the galleries. Three medical men, at a salary of 96*l.*, attend the guardians in cases of illness. The Louvre includes four workshops or studios (*ateliers*):—(1) for casts, with a *chef* and nine workmen; (2) chalcography, with a *chef* and two workmen; (3) sculpture, with a *chef* and six workmen; (4) naval subjects, with a *chef* and two workmen. A further staff of workmen is employed as required for repairs, framing pictures, &c. All the guardians, workmen, &c., are clothed by the State. The total cost of the staff (*personnel*) of these museums is set down in the annual budget at about 17,000*l.*, or about half their total annual cost to the nation.

The remaining museums and galleries of Paris are placed under the special department to which their object belongs, as indicated in the table given at the beginning of this memorandum. The Museum of Cluny is managed by a director and sixteen guardians, the Musée de Sculpture Comparée by a conservator. The officials are paid as in the museums under the Direction des Musées Nationaux. The natural history collections are under the management of nineteen professors (400*l.* a year), two drawing-masters (60*l.*), one librarian, and one assistant-librarian at 160*l.* a year each, one secretary (200*l.*), and twenty-four assistant naturalists (120*l.* to 200*l.*), making an annual total for *personnel* of 12,000*l.* The Ethnographical Museum costs nearly 1,000*l.* a year. The Musée d'Auteuil, which is not yet open, is to be placed under a conservator and a small number of Gardiens de Bureau, a category of servants in the employment of the Municipality. The Musée Carnavalet is managed by one conservator, three sub-conservators (one specially assigned to the museum proper, and the other to the library). Only four servants are directly assigned to this museum, but on open days the Municipality supplies as many of the town police, generally only four or five, as may be wanted for watching and keeping order. The museum pays them one franc a day when thus employed. The whole cost of the staff of the Musée Carnavalet is about 800*l.* a year.

#### Berlin.

There is no uniform system of regulations for the times of opening and the constitution of the staff in the public collections belonging to the Prussian State.

In the natural science collections all is at present in process of formation. The collections of the Museum of Natural Science cannot at present be seen by the general public, since, on account of their removal from the University to the new buildings, which is still in process, they are partially still packed away in cases, and not yet set up again, and partially still awaiting packing and removal; moreover, all the rooms are not yet properly arranged to receive them. A decision will, therefore, only be come to later respecting hours of opening and staff.

In the institutions under control of the General Administration of the Royal Museums, viz., Old Museum, New Museum, Museum of Ethnography, and Museum of Industrial Art, the times of opening are regulated as follows:—

1. On week-days, with the exception of Mondays. (a) For the royal museums in the Lustgarten (*i.e.*, Old and New Museums) in the winter season (October 1 to March 31), 10 to 3 o'clock; in the summer (April 1 to September 30), 9 to 3 o'clock. This regulation has only come into force during the current summer in place of the old rule (10 to 4), experience having shown a very thin attendance in the last hour, and therefore recommended the alteration. Experience has not yet sufficiently proved the benefits of this change. (b) The Ethnographical Museum hitherto on Saturdays only—winter, 10 to 3; summer, 9 to 3; fixed by the same dates as in (a). The limitation hitherto existing to one day open in the week besides Sunday was necessitated by the fact that the energies



of the staff were occupied in the labour of setting up the collections. This will shortly cease, and the Museum for Folk Lore will then be opened under the same conditions as the above museums in the Lustgarten. (c) The Museum of Industrial Art daily from 10 to 3. In this case also, if the experiment of the hours alluded to under (a) and (b) proves successful, the open period in summer will be extended from 9 to 3.

2. The royal collections are all open on Sundays and on the holidays following—Easter, Whit-Sunday, and Christmas day—from 12 to 3, in summer and winter alike.

3. All the royal museums are closed on Easter day, Whit-Sunday, Christmas day, Good Friday, Atonement days (there are two of these in the year—one universal in Germany, one special for Prussia—when all the shops are shut, and work suspended), Ascension day, as well as on every Monday, for cleaning purposes, with the exception of Easter and Whit-Mondays.

The inspection of the museums is, however, also allowed on other days besides those publicly open, except on the great festivals, especially on Mondays, on production of special cards of admission signed by the general director and the director of that special department to which admission is desired. Such cards are issued almost without exception to students alone. Educational establishments wishing to organise lectures in the rooms of the royal museums are allowed admission under conduct of the lecturer, during closed hours, with special admission cards and under the necessary prudential limitations.

Admission to all the above galleries is free, with the exception of the Industrial Art Museum, to which admission on week-days involves a charge of 50 pfennig (6d.).

The organisation of the staff is regulated by the Statute of the Royal Museums at Berlin of May 25, 1868, and by the regulations for the disposition of the directors of departments, and for the application of the funds at the disposal of the royal museums, dated November 13, 1878. Copies of these are annexed.

The Royal National Gallery collections, consisting of sculpture, paintings, and drawings by German artists of the present century, is open free in summer and winter, from 10 to 3 o'clock daily on week-days, but Mondays from 1 to 3 only; on Sundays (except on the great festivals of the Church) from 12 to 3. A daily cleaning takes place before the hours of opening, and a thorough cleaning every Monday.

Tuesdays and Wednesdays are copying days. On other days no copying is allowed, in order not to hinder the public from a free view of the works of art.

A director is entrusted with the management of the institution, with one assistant director to aid him. Office affairs are dealt with by three clerks (having rank of "Expedient," "Kalkulator," and "Registrator"), with one assistant clerk. The "Kastelan" of the Royal National Gallery, who has under him the staff of gallery attendants, a porter, a heating engineer, and one odd man, as well as the hired working-men and work-women, is entrusted with responsibility for the safety and cleanliness of the building. The gallery attendants, who are divided into three classes, are ordered to maintain a strict watch over the collections during the open hours, as well as during all operations of receiving, placing, or cleaning the works of art.

#### Amsterdam.

The principal museum of Amsterdam is the well-known Rijks Museum, containing the pictures of the great Dutch masters. This museum is open free every day, Mondays excepted, from 10 to 4 in winter (September 1 to April 30), and from 10 to 5 in summer (May 1 to August 31). The staff consists of a superintendent, two sub-inspectors, and thirty-five men, who are supplemented by twelve soldiers on the Sunday, the number of visitors being on that day greatly augmented. The only other museum of any importance is the Museum Fodor, owned by the Municipality. This museum is open every day, Tuesdays excepted, from 10 to 4, from February 1 to November 1, and during the other three months from 11 to 3. The charge for entrance on week-days is 10d., and on Sundays 5d., and the whole staff consists of two attendants.

#### New York.

There are no State or Municipal galleries in this city. The buildings of the Metropolitan Museum of Art and the American Museum of Natural History were erected by the Department of Public Parks of this city in Central Park, and the expense thereof was paid by bonds issued by the city. The Department of Parks is authorised by an Act of the Legislature to apply a sum not exceeding 30,000 dols. per annum for the keeping, preservation, and exhibition of the collections which are placed in these museums. Both of the institutions are private corporations, and in consideration of the action of the municipal authorities in erecting the buildings and appropriating a certain sum per annum for their support, the general public are admitted free on Wednesdays, Thursdays, Fridays, and Saturdays, and the Comptroller of the City and the President of the

Department of Public Parks are *ex-officio* members of the Board of Trustees. The museums are open on week-days at 10 A.M. throughout the year, and close at sunset or 6 P.M. They are closed on Sundays.

#### Philadelphia.

There are but a few public galleries in Philadelphia city that are opened to the public on Sundays, the chief among which are the Academy of Fine Arts and the Academy of Natural Sciences. The three others—Fairmount Park Collection, Memorial Hall, and the Pompeian Views, all located in the Philadelphia Park Grounds—are not of so much importance or interest to the general public. The Academy of Fine Arts is open to the public on Sundays from 1 P.M. to 6 P.M. (or until dark during the short days). On Sundays and Mondays there is no charge for admission, a regulation required by the Temple Endowment Fund. All other days the admission is 25 cents, or 1s. The regulations of the other galleries and collections referred to as open on Sunday are similar to those of the Academy of Fine Arts. The staff or governing body of these institutions consists of a president, one or more vice-presidents, a treasurer, a secretary, and board of trustees of a large or small number of members; the services of the staff, except in the case of the secretary, are performed gratuitously. The Fairmount Park Collection, Memorial Hall, and the Pompeian Views belong to the Philadelphia Park, and are free to the public.

#### GENERAL.

**The Queen** has given sittings to Mr. John Hutchison, R.S.A., for the bust which is to be placed in the Victoria Art Galleries, Dundee.

**Mr. Burne Jones** has resumed work on the four large pictures commenced many years ago, illustrating *The Legend of the Briar Rose*, or *Sleeping Beauty*.

**The Sixty-eighth Exhibition** of works by modern artists is to be opened in the Manchester City Art Gallery on Sept. 4. The number of works to be contributed by any artist is limited to three, which must be delivered at the gallery between Monday, 23rd, and Saturday, 28th inst. Over 2,000l. is at the disposal of the committee to purchase works for the permanent gallery.

**The Arcading** for "Brown's Chapel," in Manchester Cathedral, has been begun under the direction of Mr. J. Crowther.

**The Works** of the Victoria Infirmary, Langside, Glasgow, have commenced, the architects being Messrs. Campbell Douglas & Sellars.

**The Privy Council** have authorised the expenditure of 6,000l. in improvements at Londonderry District Lunatic Asylum.

**Mr. J. W. Trounson**, Penzance, has been appointed the architect for the new Post Office Buildings, St. Ives, Cornwall. Designs prepared by Mr. J. W. Trounson, have also been selected for the new Wesleyan Chapel, Penryn, Cornwall, and the work will be proceeded with forthwith.

**Mr. Edwin Seward**, vice-chairman of the South Wales Sketching Club, Cardiff, announced at the meeting of the members that the president, Lord Windsor, had invited the members to visit St. Fagan's Chapel.

**The "City Press"** states that the freedom of the Grocers' Company will be presented to Sir Frederic Leighton on the 25th inst.

**Mr. W. M. Baker**, of Hasfield Court, Gloucestershire, has undertaken the cost of the erection of the new public buildings at Fenton, of which Messrs. R. Scrivener & Sons, of Hanley, are the architects, and the foundation-stone of which has just been laid.

**A Committee** on the part of the Bury Corporation, who are desirous of establishing a technical institute for the town, have paid visits of inspection to the institutes at Chorley, Preston, Bradford, Keighley, Huddersfield, and Manchester.

**The Walsall Town Council** have arranged with the Earl of Bradford for the acquisition of over 12 acres of waste land at Bloxwich, for the purposes of a recreation-ground.

**The Wesleyans** of Salisbury have decided to reseat and make alterations to their chapel, at a cost of 1,000l. to 1,200l., and have appointed Mr. Fred. Bath, F.R.I.B.A., of Crown Chambers, Salisbury, as their architect.

**The Lancashire and Cheshire Antiquarian Society** have taken steps to secure the safety of any relics of a past age which may be discovered in the course of the Manchester Ship Canal excavations, and have caused a circular to be printed for distribution among the men, giving illustrations of arrow heads, stone hammers, axes, &c.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. **ROBERT BOYLE & SON, Ltd.**



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, JULY 13, 1888.

## TENDERS ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

## EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

## CONTRACTS OPEN.

BANBRIDGE.—July 18.—For Repairs to Unitarian Church. Mr. Hugh Glass, Solicitor, Banbridge, Ireland.

BANBRIDGE.—July 14.—For Repairs to Bannside Presbyterian Church and Building Lecture Hall. Mr. W. J. M'Keown, C.E., Banbridge.

BRADFORD.—July 18.—For Reconstruction of Bridge over Railway. Mr. W. Thorley, General Manager, Hunt's Bank, Manchester.

BRADFORD.—July 26.—For Building Gospel Hall. Mr. W. Rycroft, Architect, 10 Bank Buildings, Manchester Road, Bradford.

BRAMLEY.—July 16.—For Building Conservative Club. Mr. Thomas Winn, Architect, 5 Park Lane, Leeds.

BRIMINGTON.—July 25.—For Building Board School for Infants. Mr. J. W. Fearn, Architect, Devonshire Street, Chesterfield.

CALVERLEY.—July 14.—For Construction of Storage Reservoir at Ravenscliffe Mills. Messrs. Kendall & Bakes, Surveyors, Idle.

CILFYNYDD.—July 14.—For Building Six Cottages. Mr. M. Evans, 25 Aman Street, Cwmaman, Aberdare.

CROYDON.—July 16.—For Building Wall at Workhouse. Mr. F. West, Surveyor, Coombe Road, Croydon.

DERBY.—For Works in Connection with St. Chad's Schools. Messrs. Coulthurst & Booty, Architects, 4 Albert Street, Derby.

DEVON.—July 18.—For Renovating and Reseating Berea-stone Church. Messrs. Hine & Odgers, Architects, Lockyer Street, Plymouth.

EAST ARDSLEY.—July 14.—For Building Mission Church. Mr. W. S. Barber, Architect, 9 George Street, Halifax.

GREENWICH.—July 19.—For Building Pavilion and Additions to Union Infirmary. Mr. Thomas Dinwiddy, Architect, 12 Crooms Hill, Greenwich.

HALIFAX.—July 16.—For Building Shop. Mr. James Farrar, Architect, 29 Northgate, Halifax.

HARROGATE.—For Building Wesleyan Chapel School and Classrooms. Mr. T. Butler Wilson, Architect, 12 East Parade, Leeds.

HARTLAND.—July 18.—For Building Teacher's House and Offices at Meddon. The Clerk to the School Board, Hartland.

HASTINGS.—For Building Classroom, &c., St. Andrew's Schools. Mr. Colpoys, Architect, 33 Havelock Road, Hastings.

HURST.—July 18.—For Extension of Premises for the Local Board. Mr. Joseph Heys, Surveyor, Hurst, Ashton-under-Lyne.

LEEDS.—July 16.—For Building Hackle and Gill Pin Works. Mr. Thomas Winn, Architect, 5 Park Lane, Leeds.

LEEDS.—July 16.—For Building Club Premises. Mr. Thomas Winn, Architect, 5 Park Lane, Leeds.

LEEDS.—July 14.—For Additions to Methodist Chapel, Lower Cumberworth. Mr. T. Howdill, Architect, 13 Oxford Row, Leeds.

LEICESTER.—July 17.—For Cutting Canal, Channels, &c., Constructing Walls, Wharves, Roads, &c., in Connection with the Flood Works. Mr. J. Gordon, C.E., Borough Surveyor, Town Hall, Leicester.

LEICESTER.—For Building Children's Hospital at Infirmary. Mr. W. Beaumont Smith, Architect, Grey Friars Chambers, Friar Lane, Leicester.

LIVERPOOL.—July 14.—For Building Board Schools at St. Michael's Hamlet, Toxteth Park. Messrs. C. O. Ellison & Son, Architects, 62 Dale Street, Liverpool.

LIVERPOOL.—July 14.—For Erection of Front Building of Liverpool College. Mr. E. H. Banner, Architect, 25 North John Street, Liverpool.

LIVERPOOL.—July 23.—For Building Cottages and Valve Houses in connection with the Waterworks. The Engineer, Municipal Offices, Liverpool.

LONDON.—July 20.—For Works at St. Luke's Vestry Hall. The Surveyor to the Vestry.

LONDON.—Aug. 1.—For Building Public Baths and Wash-houses for the Vestry of St. George, Hanover Square. Mr. F. J. Smith, Architect, 272 Winchester House, Old Broad Street, E.C.

LYMM.—July 28.—For Rebuilding Tower of Parish Church. Mr. Crowther, Architect, Hanging Bridge Chambers, Cathedral Yard, Manchester.

MATLOCK BANK.—For Building All Saints Vicarage. Mr. G. E. Statham, Architect, Wheeler Gate, Nottingham.

NEWBURY.—July 13.—For Construction of Mortuary, &c., in Rear of Corn Exchange. The Borough Surveyor, Newbury.

NORTH SHIELDS.—July 16.—For Alterations and Additions to Jubilee Schools. Mr. Haswell, Architect, 77 Tyne Street, North Shields.

POCKLINGTON.—For Altering Chapel. Rev. W. Hayton, Union Street, Pocklington.

PONTYPRIDD.—July 17.—For Rebuilding Tower of Eglwysilan Church. Mr. Vaughan, Architect, Cardiff.

POULTON.—For Erection of Farm Buildings. Mr. J. D. Mould, Architect, 77 King Street, Manchester.

SHIPLEY.—July 16.—For Building Business Premises. Mr. J. Crawshaw, Architect, 54 Otley Road, Shipley.

SHOTLEY BRIDGE.—July 13.—For Building Two Houses for the Co-operative Corn Mill Society. Messrs. John Smith & Son, Architects, Rose Cottage, Shotley Bridge.



**SOUTHEND.**—July 24.—For Construction of Iron Piers. Messrs. Brunlees and McKerrow, 5 Victoria Street, Westminster.

**SOWERBY BRIDGE.**—July 16.—For Building Five Houses, New Marsh. Mr. S. Wilkinson, Architect, Sowerby Bridge.

**STOCKSBRIDGE.**—July 17.—For Building the Fox Memorial Church. Mr. J. D. Webster, Architect, 21 Church Street, Sheffield.

**STONE.**—July 16.—For Building Mortuary at Workhouse. Mr. J. J. Chapman, Granville Terrace, Stone.

**STOUGHTON.**—July 18.—For Building Mortuary at Cemetery. Messrs. Peak, Lunn & Peak, Architects, 3 Market Street, Guildford.

**TETBURY.**—July 31.—For Building Passenger Station, Tetbury, and Additions to Kemble Junction Station. Mr. J. D. Higgins, Secretary, Paddington Station, W.

**WORKINGTON.**—July 24.—For Pulling Down and Rebuilding Presbyterian Church. Mr. W. G. Scott, Architect, Victoria Buildings, Workington.

**YORK.**—For Building Additional Warehouses and Factory Chimney at Cocoa Works, for Messrs. H. I. Rowntree & Co. Messrs. Edeson & Rowntree, Architects, Westborough Chambers, Scarborough.

### TENDERS.

#### ALVERSTOKE.

For Erection of Porches to Chapels and Entrance Gates, &c., at the Alverstoke Burial Ground. Mr. WM. YEARDYE, Architect, Gosport.

J. Crockerell, Landport	£230	0	0
J. Luke & Son, Gosport	180	0	0
W. Lowe & Son, Gosport	169	8	0
C. Lear & Son, Gosport	169	0	0
W. Rapley & Son, Gosport	166	9	8
C. M. DASH, Gosport (accepted)	156	18	0

#### BOURNEMOUTH.

For Additions to the Osborne. Mr. H. E. HAWKER, M.S.A., Architect.

JENKINS & SONS (accepted)	£375	0	0
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#### BOURNEMOUTH—continued.

For Additions to the Herbert Convalescent Home. Mr. H. E. HAWKER, M.S.A., Architect, Bournemouth.

Jones	£1,160	0	0
McWilliam	1,145	0	0
Jenkins & Sons	1,095	0	0
GEORGE & HARDING (accepted)	982	0	0

#### BLACKPOOL.

For Erection of Wesleyan Chapel, South Shore, Blackpool. Mr. J. H. BURTON, Architect, Ashton-under-Lyne.

	Without Spire.	Spire.
T. Rome, Manchester	£5,400	£1,000
W. Southern & Sons, Salford	5,395	805
Stephenson & Co., Manchester	5,300	728
T. Stopford, Manchester	5,143	944
Butters & Carson, Manchester	5,079	855
T. Mitchell, Halifax	5,100	830
W. Neal, Ashton-under-Lyne	5,000	650
J. Fielding & Sons, Blackpool	4,988	824
J. W. Gill, Keighley	4,900	850
W. Eaves, Blackpool	4,888	751
J. Davison, Manchester	4,875	888
J. Statham & Sons, Pendleton	4,800	700
G. Smith, Marton	4,777	854
W. Holt, Manchester	4,734	895
A. Holmes, Ashton-under-Lyne	4,560	680
T. H. Smith, Blackpool	4,540	780
R. Whitell, Manchester	4,475	692
Butterworth & Sons, Blackpool	4,470	681
W. H. DEAN, Blackpool	4,396	895

\* Accepted (without spire), and subject to certain deductions.

#### BRIGHTON.

For Supply of Portland Cement, for one year, for the Brighton Town Council.

Greave, Bull & Lakin	£2	2	0
J. Griggs & Co.	1	18	6
J. B. White Bros.	1	18	0
T. & W. Weeks	1	18	0
Peters Bros.	1	18	0
J. C. Gostling & Co.	1	18	0
Formby's Cement Co.	1	17	0
Macevoy & Holt	1	15	2
SUSSEX PORTLAND CEMENT CO. (accepted)	1	9	9

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For Painting Congregational Schools, Darwen.

R. Bennett, Manchester	£140	0	0
G. Tootle, Blackburn	100	0	0
R. Jackson, Darwen	95	0	0
C. Dixon, Blackburn	93	0	0
PARKINSON BROS., Darwen (accepted)	82	10	0

## DERBY.

For Building Wesleyan Schools, Greenhill, Derby. Mr. JOHN WILLS, Architect, Derby. Quantities by Architect.

Wagg, Derby	£815	0	0
Kelham, Derby	780	0	0
VERNON, Derby (accepted)	753	0	0

## DUMBARTON.

For Construction of Slaughter-house, Town's Common, Dumbarton.

## Lowest and Accepted Tenders.

J. Goldie & Sons, Glasgow, brickwork	£895	0	0
W. McLeod & Sons, Dumbarton, joiner	715	0	0
W. Darrie, Glasgow, slating and plastering	99	5	0
A. Colville & Son, Dumbarton, plumber	84	18	0

## DURHAM.

For Boundary Walls, Iron Railing, &amp;c., in Connection with Extension of St. Oswald's Burial Ground, Durham. Mr. J. HENRY, Architect, North Bailey, Durham.

W. Pratt, Durham, mason, &c.	£319	0	0
Hauxwell & Sons, Durham, smith	65	0	0
S. Adamson, Durham, painter	1	10	0

## GATESHEAD.

For Cementing Pathway, Durham Road. Mr. J. BOWER, Borough Surveyor, Durham.

W. B. Wilkinson, Newcastle	£778	9	8
T. Rule, jun., Gateshead	663	19	5
W. Lawton, Tynemouth	645	4	11
D. Ormerod, Blackhill	634	17	8
S. Millard, Newcastle	601	7	5
Jones's Cement Co., Middlesbrough			
J. T. SIMPSON, Newcastle (accepted)	559	18	11

## GLASGOW.

For Rebuilding Delmarnock Bridge, Glasgow.

A. H. Boyle, Bonnybridge	£25,931	14	6
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## Steelwork.

J. Goodwin &amp; Co., Motherwell.

## HALIFAX.

For Building St. Jude's Church, Halifax.

Charnock & Sons, mason and carpenter.  
Bancroft & Son, slater and plasterer.J. Naylor, plumber.  
Binns, King Cross, painter.Cost about 5,000*l.*, apart from the tower, which at present is only to be carried up as far as the belfry floor.

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For Building Warehouses attached to Messrs. Cranfield's Roller Mills, Quay.

Grimwood.	£4,497	0	0
F. Bennett	4,485	0	0
Kenny	4,474	0	0
Saint.	4,464	0	0
Gibbons	4,250	0	0
Wyatt	3,998	0	0
Thackray	3,949	0	0
Bunting	3,813	0	0
PAGE (accepted)	3,740	0	0

## LEEDS.

For Alterations and Additions to House, Erection of Drapery Store, Out-offices, and Boundary Walls, Leeds. Messrs. SWALE &amp; MITCHELL, Architects, Leeds. Quantities by Architects.

G. Thompson Wright, mason, bricklayer, and plasterer.

W. Hart, joiner.

J. Wilson, plumber.

J. Season, slater.

A. Dougill, whitesmith and bellhanger.

H. Boshill, painter.

For Building House, Stables, Workshop, &amp;c., in Roundhay Road, Leeds. Messrs. SWALE &amp; MITCHELL, Architects, Leeds. Quantities by Architects.

## Accepted Tenders.

John Routh, concrete, brick, mason, and joiner.

Foster &amp; Jackson, plasterer.

A. Hurd, plumber.

Adam Temple, slater.

Richard Wood, painter.

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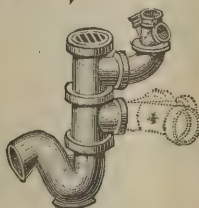
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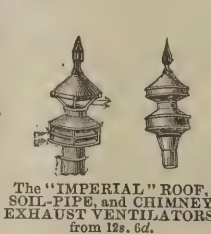
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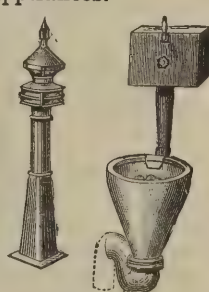
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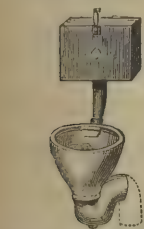
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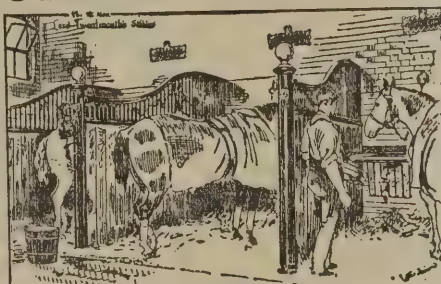
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G. Sear, Watford ( <i>withdrawn</i> ) . . . . .	—		

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## TRADE NOTES.

AN alarming subsidence took place last week on market day in the yard of the Wheatsheaf Hotel, Northwich, when the yard was crowded with the horses and traps of farmers. A large portion of the open yard and of the floor of the adjoining stabling suddenly gave way. Several persons had narrow escapes, and one horse was engulfed.

SIR JAMES PICTON and others of the Liverpool magistrates, in company with Mr. Sumners, the architect, inspected the alterations at the Court Theatre on Monday, and expressed their satisfaction with the fire-resisting curtain that is being constructed by Messrs. Clark, Bunnett & Co.

A LARGE clock has just been erected on the church tower at Baconsthorpe, Norfolk, by Messrs. John Smith & Sons, Midland Clock Works, Derby, which is fitted with all the improvements introduced by this firm. It has one face 5 feet across, and strikes the hours.

ALTERATIONS have been made in the Local Board Offices, Old Charlton, embracing the ventilation, which is now carried out on the Boyle system, the vitiated air being extracted by the latest improved form of the patent self-acting air-pump ventilator, while the fresh air supply is admitted by Boyle's latest improved air inlets.

A MEETING is announced to be held in the Council Chamber, Town Hall, Newcastle, on Monday, 16th inst., at 7.30, to consider the registration of qualified plumbers as a measure for securing the higher efficiency of Plumbers' Craftsmanship in the interests of public health. The Worshipful the Mayor of Newcastle will preside, supported by the Recorder of Newcastle, the Principal of Durham College of Science, and members of the medical profession, &c. Deputations will also attend from the Corporations of Stockton, Darlington, Gateshead, Tynemouth, and other towns.

THE additions to St. Thomas's Church, Monmouth, have recently been completed, Mr. F. A. Powell being the architect. The church is now warmed throughout by means of one of Shorland's patent underground hot-air stoves fixed under the vestry, and supplied by Mr. E. H. Shorland, of Manchester and London.

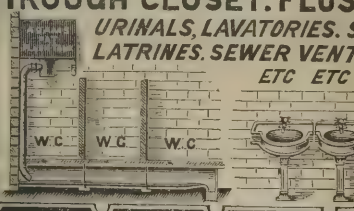
MR. J. NEALE BAKER, having terminated an engagement of twenty-two years as accountant and traveller for the *Hereford Times*, has commenced business as auctioneer, accountant, &c., at 28 Widemarsh Street, Hereford, and from his long experience he is competent to undertake the settlement of accounts and balance-sheets, however complicated.

SOME valuable freehold building land, in an eligible position at Finchley, was offered for sale by public auction on Thursday evening by Mr. W. R. Norris, of 29 & 30 Southampton Buildings, Holborn.

THE extension of Lofthouse Church has been commenced from the designs of Mr. William Watson, of Wakefield.

THE Messrs. J. & P. Coats, thread manufacturers, Paisley, require two powerful and separate engines in their extensive new twisting mill in course of erection at Ferguslie, and have given the order for one of the engines to the Paisley firm, Messrs. Fullerton, Hodgart & Barclay, and the other to a

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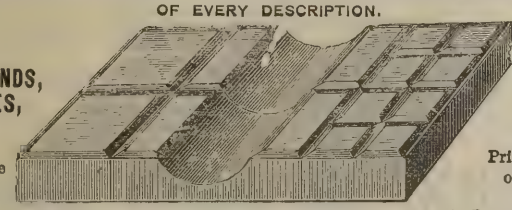
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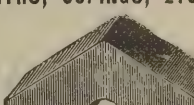
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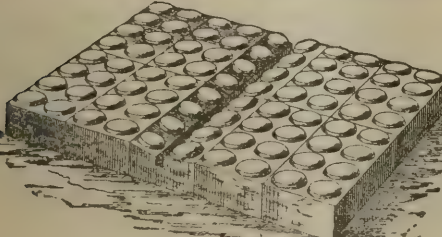
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THE old parish church, Thame, being in need of structural repairs, it was decided at a meeting of the parishioners held last week that a scheme of restoration, as recommended by Mr. Wilkinson, should be commenced.

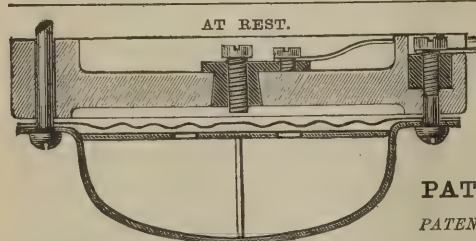
PLANS by Messrs. Whitfield & Thomas, London, have been adopted for proposed alterations at St. Paul's Church, Tottenham, and estimates for carrying out the work are to be obtained.

THE Derby Town Council have passed a vote of condolence with the relatives of the late Mr. Coulthurst. The Council also considered the steps which should be taken as to the appointment of a successor. Under the late arrangement the Borough Surveyorship was worth about 700*l.* per annum.

#### THE CONCRETE OF THE ABERDEEN GRAVING DOCK.

A LENGTHY report by Mr. Philip J. Messent, C.E., has been prepared as to the quay walls of the Aberdeen Graving Dock. The harbour quay walls, Mr. Messent says, formed a portion of the Albert Graving Dock contract, commenced in 1881, and the quay walls by which the Graving Dock site was partially enclosed were completed in 1883. The total length of the walls on coping level according to the contract is 882 feet, of which 674 lineal feet are on the south side of the dock and entrance, and 208 lineal feet at the east end. The quay walls now form continuations of the wing walls of the dock entrance, and during the construction of the dock they formed a continuation of the cofferdam used for the work. They were made of concrete faced with granite from  $3\frac{3}{4}$  feet above low water to the coping, and were partially supported on a row of sheet piling,  $5\frac{1}{2}$  inches thick and 8 feet long near the face, and a row of bearing piles, 12 inches diameter, 8 feet long, and spaced 4 feet apart near the back. The bottom of the concrete and tops of the piles are approximately at the level of  $11\frac{1}{4}$  feet below low water spring tides. The top of the walls, coped with granite, are  $17\frac{3}{4}$  feet above low water at, and eastward of the entrance to the Graving Dock, falling by an inclination of about 1 in 100 to  $15\frac{3}{4}$  feet, at a distance of 200 feet west of the south-east angle of the wall. They are 12 feet thick or wide

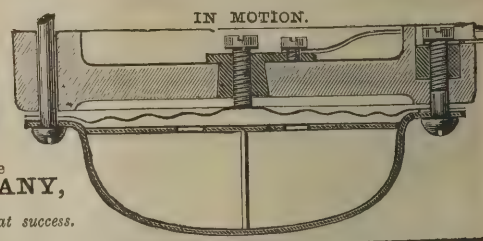
at the base, and 10 feet at the level of  $3\frac{3}{4}$  feet above low water, the face, from 7 feet below to  $3\frac{3}{4}$  feet above low water, being vertical, above which, to the top, it has a batter of  $\frac{1}{2}$  inch per foot. According to the contract plans and specification, the base, for a height of 3 feet, was to be composed of concrete made of Portland cement, sand, and gravel, in the proportions of 1 + 3 + 4, deposited soft in bags, whilst the concrete above this, for a height of 12 feet, or to about  $3\frac{3}{4}$  feet above low water, was to be composed of a facing 2 feet thick, of strong concrete, made of 1 part cement,  $1\frac{1}{2}$  sand, and 2 gravel, the upper portion of the wall being made of concrete comprised of 1 part cement, 2 sand, 3 gravel, and 4 of stones, faced with granite ashlar. After the contract had been entered into, but before the commencement of the work, the specification was altered as follows, the alteration being necessitated by the experience gained in this method at Provost Jamieson's Quay:—"For the concrete in bags in foundation, the fine concrete facing, and the concrete behind the fine concrete facing, were substituted a homogeneous mass of concrete, deposited inside frames, composed of 5 measures sand and stones to 1 of Portland cement for one-third of the depth of the frame (i.e., from  $11\frac{1}{4}$  to  $6\frac{3}{4}$  feet below low water), and of 7 measures of sand and stones to 1 of Portland cement in the upper two-thirds of the depth of the frame (viz., from  $6\frac{3}{4}$  feet below, to about  $3\frac{3}{4}$  feet above low water spring tides), with an addition of, on an average, 10 tons of large stone to each frame of 15 feet length of wall." The concrete in the above described part of the walls, viz., from  $11\frac{1}{4}$  feet below to about  $3\frac{3}{4}$  feet above low water, was executed and deposited on what is termed the "plastic system." The peculiarity of this system consists in allowing the concrete, after being mixed, to remain in air for a few hours, and to partially set before it is placed in the work, below water—for the operation of placing it in the moulds, boxes or skips, with doors opening at the bottom and lowered by cranes, being used. This mode of using concrete is of comparatively modern introduction, and is at variance with the long-adopted practice of engineers and their opinion, that cement concrete or mortar, when it had once commenced to set, was injured or deteriorated by being disturbed, and was so prevented from ever attaining strength, such as it would have attained had it been undisturbed. In a paper by the author or inventor of the system, read at the Institution of Civil Engineers, in 1886, the author, describing experiments made by D. M'Allister, states that they "show that  $3\frac{1}{2}$  to 1 concrete, after setting out of water



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for eighteen hours, and then rammed into moulds, will form a monolithic mass when afterwards placed in water; but the strength of this mass will very much depend upon the time allowed for setting before deposition. If only eight hours elapse between mixing and deposition, there is practically no reduction in strength, but with a longer interval the strength is gradually reduced, until, at about eighteen hours, it is little more than one-half." My experience is not confirmatory of the above, and I believe that a considerable reduction in the strength of concrete will result if even less "than eight hours elapse between the mixing and deposition." It is, however, possible that, notwithstanding the reduction of strength by the plastic method (in some measure admitted by the author), that there may be still sufficient strength left in the concrete so used for the work that it has to do, supposing it to be exempt from future deterioration. The result of my examination of the plastic concrete now under consideration is that it is certainly not as strong as ordinary concrete composed of the same proportions of cement, sand, and gravel should be, although it is solid and compact, and probably in most cases still strong enough for its work, especially if it is not in course of deterioration. As to this, Mr. Smith and Mr. Pirle assured me that, in their opinion, it had not deteriorated in strength during the last four or five years. From this opinion it appears probable that this, the submerged portion of the wall, has not suffered from the chemical action of the sea water with which it is in contact, but I rather regret that this most probable assumption has not been indisputably verified by a chemical analysis. As to the general design and construction of the walls, although I would have preferred that the solid structure should have been several feet lower, which would have probably prevented the entrance of tidal water under the walls referred to on page 18 of my report of November 24, 1887, I do not think that, up to the present time, the absence of that arrangement has caused any serious damage or inconvenience. In my examination of the whole length of the walls on March 29 I found some cracks, a few leakages, and some irregularities in height and line, but the only part that seemed, in my opinion, to require immediate permanent repair was the east portion of the wall facing the sea, or entrance to the harbour, and a small portion of the south wall. The east part of the quay wall, as well as a considerable length of the south portion, suffered an extraordinary strain, for which it was not designed or constructed, by being subjected to the pressure of a head of

tidal water in 1883, before the embankment behind was completed. By this pressure it was moved and cracked, and, although the visible defects were repaired, and other protective additions were made, a strain that would cause such movements and fractures would, in my opinion, also weaken other portions of the structure, although such weakening may not be outwardly apparent. The east quay wall adjoins the south wing wall of the Graving Dock, and, whilst it is in the most exposed position, it is in a shaken and unsatisfactory state. I am, therefore, of opinion that it would be advisable to repair and strengthen it, as well as a short length of the south wall, with as little delay as possible. The suggested strengthening consists of a concrete apron, similar to (and in continuation of) the new concrete apron in front of the Graving Dock sill; the facing of the plastic set concrete of the lower portion of the wall with granite ashlar and rubble backing, and the re-setting when required of the granite ashlar facing of the upper part of the wall. The ashlar and rubble masonry to be set in Portland cement mortar, with not more than  $1\frac{1}{2}$  parts sand to 1 of cement. The cement, sand, and gravel in the concrete to be in the proportions of  $1 + 1\frac{1}{2} + 4\frac{1}{2}$ . In the drawing that accompanies the report, I have shown, as the mode of executing the proposed work, an extension of the inner row of sheet piling now existing, and forming part of the present dam. This row to form the inside of the dam for executing the repairing work, and the lower portions of the piles to be left in so as to form an outside protection, if required, to the apron. It is possible, however, that after further examination and conference with Mr. Smith on the spot, it may be found desirable to modify the above mode of executing the work, without altering the character or quality of the permanent work of repair, which will, I believe, render the repaired portion of the quay permanently safe and substantial, whilst other portions of the walls may be similarly treated should they hereafter require it. I estimate the cost of the repair above recommended at 900*l*.

The Maintenance of Works Committee of the Harbour Board recommend that the quay walls of the Graving Dock should be repaired as proposed by Mr. Messent in his report, and that the engineer should be authorised and instructed to carry out the work under the directions of the committee; it being understood (1) that the committee shall have power to consult with Mr. Messent during the progress of the work if deemed expedient or requisite; and (2) that the temporary dam for executing the repairs shall be constructed in line with

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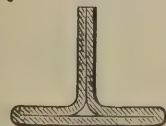
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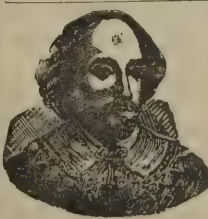
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#### DAMAGE TO PROPERTY FROM EXCAVATIONS.

THE case in which a claim is brought by Mr. H. W. Caton for damage caused to his property, 106 Blackman Street, Borough, by the excavations of the City and Southwark Subway Company on land adjoining the property, was heard at the Surrey Sessions House lately. The amount entered in the claim was 3,500*l.*, which had been afterwards reduced to 2,700*l.*

Mr. McColl and Mr. Pooley were counsel for the claimant, and Mr. Wheeler, Q.C., and Mr. Coppock for the company.

Mr. McColl explained that Mr. Caton was a veterinary surgeon, not resident at these premises, but at present the proprietor of the premises and of the business carried on in them under the style of Bussey & Co., cork manufacturers and merchants. The business had been carried on in this place for forty years or more, and it was purchased by Mr. Caton in 1880. From that time it had been carried on under the management of Mr. Bussey and Mr. Bussey's son. The premises consisted of four storeys and a basement, with a workshop at the rear. The claimant held them upon a lease of twenty-two years from 1871, at a rental of 110*l.* per annum. In the lease there were the usual covenants, one of which was to maintain the premises in good order and condition, and to deliver them up to the owner of the land at the end of the term of the lease. In consequence of the damage caused by the company's works the claimant would have to go to great expenditure in order to comply with the covenant, as he would be required to do. These buildings were newer than most of the surrounding buildings. The front premises were burnt down and rebuilt in 1860, and the back premises burnt and rebuilt in 1873 or 1874. The Subway Company was formed in 1884, with a capital of 300,000*l.*, and with power to borrow 100,000*l.* When giving the company the necessary powers, Parliament had incorporated with the Companies' Act the Land Clauses Act, and in another section had provided that the company should pay compensation to all the owners of property who were occasioned any inconvenience, loss, or damage by the exercise of the company's powers. In April 1887 the company took possession of a piece of vacant land adjoining the claimant's premises, and there a deep hole was sunk—a

huge shaft, 25 feet wide and 56 feet deep, and only 15 feet from the flank wall of the claimant's premises. There was, moreover, a cavity in excavation from the side of the shaft in the direction of the flank wall of the premises, and that excavation, he would be able to show, came almost vertically under the side wall of the house. In August 1887 the first intimation of danger was that the ground between the flank wall and this large shaft began to sink, and the large struts which were against the flank wall came away. The company at once tightened the struts, and thus, he contended, admitted their responsibility. It was expressly enacted that the company were to have power to underpin and make secure all houses within 100 feet on either side of their works, so that possible damage to property at that distance was evidently contemplated. Shortly afterwards the basement of the house became flooded, and a quantity of cork was injured; but for that the company paid, and the works went on as before. As the works proceeded, the damage became so apparent that the district surveyor gave notice that the house was moving and was dangerous, and that steps must be taken at once to shore it up and protect it. The answer of the company to the complaints of the claimant was that the works had been very carefully executed; but a company like this could not, however carefully they executed their works, injure other people's property without paying compensation. Cracks in the walls of the premises appeared and increased in number, and ultimately the claimant was summoned before the magistrate, and ordered to take the necessary steps to make the buildings safe. The magistrate, of course, had no power to make this order upon the company, who were the really responsible parties. In the course of the excavation a platform was formed and carried transversely across it in the direction of the street, so that as the platform was made the pavement in Blackman Street was found to sink. At one time it had sunk so much that the kerbstone was almost on its side, and although something had been done to make the pavement good, it was still in a very uneven state. The company suggested that the cause was certain works which the Board of Works had carried out in connection with the widening of Mint Street into Marshalsea Road, and to the excavations then made for the new sewer. The sewer was 24 feet deep. But as it approached the claimant's premises it went right over to the other side of the road, so that it was actually distant from the premises, whereas the subway excavations were only 16 feet away. Nothing was to be done to the premises except to rebuild them, and that would cost 1,700*l.*

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Then there was injury to the business, rent of other premises during the rebuilding, and cost of refixing machinery. The machinery was a trade secret, and it was very important that it should not be seen or known by any one out of the business, and the least movement which occurred to its foundations rendered useless that important part of the machinery which cut the cork into thin sheets. The claimant, however, made no claim in respect of injury to the business, not because the business would not be injured, but because the disclosure of the details of his business in a public court like this would be infinitely more injurious to him than would be met by any compensation which the jury could possibly award. The heads of the claim, therefore, were:—Cost of rebuilding; rent of new premises during alterations; cost of removing and refixing machinery; general loss and inconvenience to the business; loss on forced sale of stock, if compelled to sell; loss incurred by purchasing (if enabled) from competitors to supply customers during interval of rebuilding.

Mr. Wm. Smith, architect and surveyor, of Gresham Buildings, examined by Mr. Pooley, gave evidence in general accordance with the statement of the learned counsel. He described the condition of the premises at several successive examinations which he had made. The direction of the settlements was towards the excavations of the company. There could be no doubt, he considered, that the settlements were due to the company's works, and not to the sewer of the Board of Works. The company's machinery in the excavation caused a great vibration. The tunnel ran under Blackman Street, and the house was trending in the direction of the tunnel. The transverse excavation seemed to come to just under the kerb of the paving in front of the house. He considered that the only thing to be done with the premises was to rebuild them, the cost of which would be, he estimated, 1,709*l.* 15*s.* 6*d.* The entire cubic contents of the front building was 46,061 feet, and the works behind 27,362 feet. Then there would be the other expenses, as counsel had mentioned. The machinery was beautiful, and very delicate. It would cut cork so fine that it could be printed upon like paper.

Mr. Chas. F. Hayward, district surveyor for St. Giles's and St. George's parishes, said that he had had special experience in connection with damage caused to buildings by excavations. He concurred with the evidence of the last witness.

Mr. A. Garrard, surveyor, of 60 Cannon Street, and Mr. E. B. Fuller, of 70 Queen Street, Cheapside, also gave confirmatory evidence.

Witnesses were cross-examined by Mr. Wheeler, and the inquiry was adjourned.

At the adjourned hearing further evidence was called on behalf of the claimant.

Mr. W. J. Larke (Messrs. Larke & Sons), builder and contractor, of 44 Fore Street, described the shoring of the claimant's buildings. His estimate of the cost of the rebuilding was 1,712*l.*, which would include the necessary work to secure the foundations. His rate of calculation was 9*d.* per cubic foot for the front portion, and 8*d.* for the back premises.

Mr. Charles Deering (Messrs. Deering & Sons), builder, of Islington, said that his estimate for the rebuilding was 1,690*l.*

The claimant said that he knew nothing of the condition of the premises before he purchased them in 1880.

For the company, Mr. James H. Greathead, engineer, of 8 Victoria Chambers, Westminster, said that he was engineer to the undertaking, and gave a description of the mode of carrying on the company's works in the neighbourhood of the claimant's premises, in order to show that the foundations of no house could be disturbed by the tunnelling or other excavations. He had examined the claimant's premises very carefully when the company's works were begun, and he was certain that the cracks which were visible now were visible then. The premises had been shored up before the tunnelling was commenced at all. He was informed in August 1887 that a portion of the shoring had left the building, but it was not in any way due to the works of the company. That was the first complaint which the company had received. The claimant's premises were in a very dilapidated condition. The machinery was very light, and all upon the upper floors.

Mr. W. McCleary said that he was resident engineer at the works in question. In his opinion the company's works had caused no injury to the buildings.

Cross-examined: There was no pumping going on in February 1888, when the cracks began to develop. He thought that the cracks had continued to develop since February of the present year.

Mr. Baker said that he was engineer to the Metropolitan District Railway. He was of opinion that no injury had been caused to the building by the tunnelling and other works.

Mr. A. Malcolm having given similar evidence,

Mr. James Hodson, agent to the contractor, said that photographs he had caused to be taken showed that the cracks were visible before the company's works were commenced.

Mr. A. R. Stenning, surveyor, of 121 Cannon Street; Mr.

# HOT WATER INSTANTLY.

## NIGHT or DAY.

### THE "LIGHTNING GEYSER."

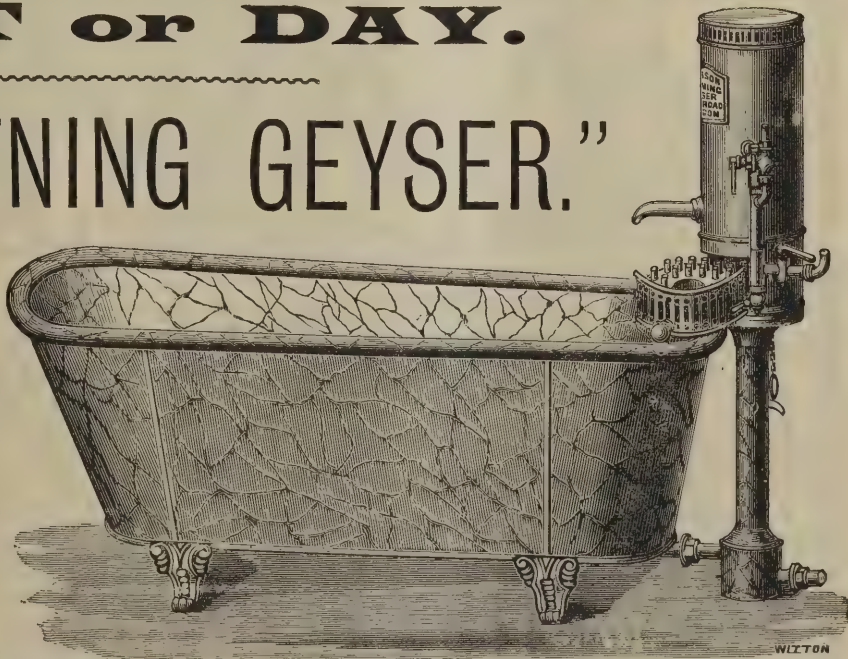
A Hot Bath in 5 Minutes.

BOILING WATER IN A MINUTE.

The woodcut shows the Geyser adapted to a Bath without Mahogany Casing.

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"THE SALISBURY."



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T. Verity, of Regent Street; Mr. A. Baker (Messrs. Baker & Sons), surveyor, of Queen Victoria Street; and Mr. B. Fletcher C.C., were also examined, their evidence corroborating that given by the previous witnesses.

Mr. Wheeler, addressing the jury on behalf of the company, said that the company came into Court under protest. They submitted that they were not responsible for the subsidence, which was caused by the bad building and the "made-up" ground, the new sewer of the Metropolitan Board of Works, and by the breaking-up of the road for gas-pipes, and not from any of the company's works.

Mr. McColl, replying for the claimant, said that to speak of the subsidence as being caused by the laying down of gas-pipes was idle talk. It was impossible that such work should interfere with the foundations of a house. The claim was a moderate one. The claimant would not be adequately compensated by any amount which the jury might award.

The learned Assessor having summed up the evidence, the jury retired for consultation, and upon returning stated, through the foreman, that they found a verdict for 330*l.*, but were unable to say what part of the damage was due to the works of the Subway Company and what part to the operations of the Metropolitan Board of Works.

The learned Assessor said that he could not accept the verdict with that qualification. The jury must say absolutely what was the amount of damage done by the Subway Company.

The jury, after some discussion, retired again, and upon returning gave a verdict for 200*l.*

#### TENDERS FOR CITY LAND.

At the meeting of the Commissioners of Sewers on Tuesday, the 26th ult., a letter from the Town Clerk was read in reference to the land opposite Billingsgate Market as follows:—Referring to the letter of Mr. Architect, of the 24th ult., to the engineer of the Commissioners, embodying the resolution of the Markets Committee in reference to acquiring this land, I have now to inform you that the Markets Committee, having held a special meeting this day, have passed the following resolution, which by their instruction I forward to you, with a request that it may be laid before the Court of Sewers at its meeting on Tuesday next, viz.:—"That this committee, convinced of the public advantage of acquiring the said land for the purposes of

Billingsgate Market, and the erection of further buildings thereon, is prepared to recommend the Court of Common Council to take the land, excluding footpaths, at the valuation of the engineer of the Court of Sewers, viz., 2,430*l.* per annum, and also to pay the cost of the vaults constructed thereon, viz., 1,215*l.*, subject to the printed conditions as to peppercorn, and to a provision for purchase at an amount to be determined by an umpire, unless mutually agreed between the architect and engineer, and that the resolution of May 18 last be varied accordingly."

After a noisy discussion the proceedings were further adjourned, the members leaving the Court in confusion.

On Tuesday, the 10th inst., the debate was resumed.

The letter from the Markets Committee, laid before the last Court, stated that they were prepared to recommend the Court of Common Council to take the land at the engineer's valuation, viz., 2,430*l.* per annum, also to pay the cost of the vaults constructed thereon, viz., 1,215*l.*, subject to the printed conditions as to peppercorn, and to a provision for purchase at an amount to be determined by an umpire, unless mutually agreed between the architect and the engineer. The motion was:—"That neither of the said tenders be accepted, but that the land be offered to Colonel North for 2,430*l.* per annum"; and the amendment: "That the amended proposal of the Markets Committee be accepted."

The *City Press* gives the following report of the debate:—

Mr. Judd moved, "That as the Commission was thinly attended, the debate should be further adjourned."

Mr. Morton spoke at some length on the motion for adjournment, being several times called to order. The motion was ultimately rejected by 19 to 9.

Mr. C. T. Harris moved the adjournment of the Court, remarking that out of 27 present 20 were members of the Markets Committee.

Mr. Mathew seconded the motion in the interest of the Markets Committee.

Mr. Deputy Ashby: Do sit down.

Mr. Mathew wanted to prevent Mr. Deputy Ashby making himself ridiculous. It would be a scandal to the Commission if they continued the debate that day.

Mr. Treloar, referring to Mr. Mathew's "virtuous indignation," said for a member of the ward of Farringdon Without to be told to sit down when he wanted to stand up was ridiculous. The Commission was growing smaller by degrees and beautifully less.

# MAW & CO.

## BENTHALL WORKS, JACKFIELD, SHROPSHIRE.



TILES

PLAIN AND ORNAMENTAL.  
for WALLS, HEARTHS, FLOORS.  
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MOSAIC & ENCAUSTIC.



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Mr. Greenwood said those who were absent at Brixton were neglecting public business for their pleasure.

Mr. Morton said Mr. Greenwood had told him he was going to oppose the motion.

Mr. Greenwood indignantly denied the statement.

Mr. Morton: It was after dinner on the boat.

Mr. Greenwood: I have not been on board of any kind of boat or vessel.

The Chairman: You are only rising to Mr. Morton's fly.

Mr. Morton: Mr. Greenwood has quite forgotten that he went to Canvey Island with us the other day.

After an exciting scene between Alderman Sir W. Lawrence and Mr. Morton,

The Chairman charged Mr. Morton with wilfully disobeying the chair, and asked the Commission to support him.

Mr. Morton quite agreed with the chairman. If necessary they would discuss the question till ten o'clock.

Mr. Williamson said Mr. Morton's sole object was to waste time and degrade the Commission.

The motion for adjournment being negatived,

Mr. Judd proceeded to discuss the main question.

Mr. Morton said he opposed the spending of the City's cash simply to bolster up Billingsgate Market. Since the last meeting probably the truth had leaked out with regard to this matter. It appeared that the gentlemen in the market were afraid that fish shops were going to be opened by Colonel North, and the Corporation was asked to go to this enormous expense simply to buy out competition. The Corporation was asked to pay 70,000*l.* for the freehold, 1,215*l.* for the vaults, and 50,000*l.* or 60,000*l.* for building. This was not to benefit the fish trade or Billingsgate, but simply for a property speculation. The Corporation had not got the money to purchase the property.

Mr. Williamson said Mr. Morton had done nothing but oppose members of the Markets Committee and tenants of the Corporation. This action had been taken by the Markets Committee on direct instructions from the Common Council. An application was made to the Court by tenants of the Corporation.

Mr. Morton: Give the names of the tenants.

Mr. Williamson: The petition was presented by the London Fish Trade Association, including eighty-seven salesmen in the market. The Corporation was bound to provide space in the market for any *bonâ fide* fish salesman, and at the present time the space was altogether insufficient. Let Mr. Morton oppose

the report of the Markets Committee in the Court of Common Council. At the present moment the revenue of Billingsgate Market was upwards of 8,000*l.* a year, and the Corporation would be able to secure the necessary money to acquire the land. He rejected the vile insinuations of Mr. Morton, and said the Corporation was actuated solely in the interests of the public.

Mr. Morton: Read the letter.

The Clerk read the letter from the Town Clerk, as above.

The amendment agreeing to the proposal of the Markets Committee was carried by 25 to 3.

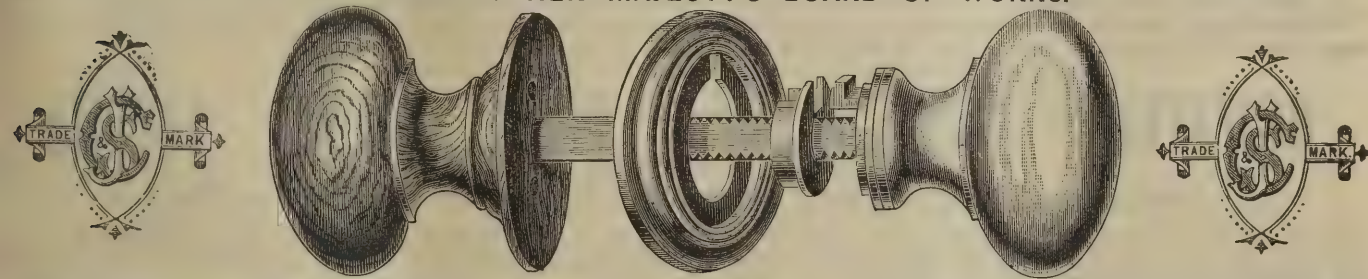
#### THE BUILDERS' ACCIDENT INSURANCE, LIMITED.

THE seventh ordinary general meeting of the above company was held at the registered offices on Thursday, the 5th instant, Mr. Stanley G. Bird in the chair. The minutes of July 29, 1887, were read and confirmed. The secretary, Mr. E. S. Henshaw, presented the reports and balance-sheets for the year ending May 31, 1888. The report and balance-sheets, as presented to the meeting, were adopted unanimously. The following five directors—Messrs. F. J. Dove, J. S. Jones, Wm. Southern, Thos. Urmson, and J. C. White (who retired from the Board under the Articles of Association)—were re-elected, and Mr. John Mowlem Burt was elected a director to fill the vacancy on the Board caused by the decease of Mr. Thomas Patrick, who was on the rota to retire this year. The usual formal resolutions having been passed, the meeting terminated with a vote of thanks to the chairman.

#### ELECTRIC APPLIANCES.

WE have pleasure in referring to some excellent improvements introduced by Messrs. P. Jolin & Co., Narrow Wine Street, Bristol. We will commence with the patent "Diamond" bell, as illustrated on next page. This bell is perfectly dustproof, so that it can be used in the dustiest factory without danger of failure, and by the device of winding the coils of the electromagnets in a double differential circuit instead of in the usual single circuit, the requisite magnetic attraction is given to the cores of the magnets without the use of a special contract pillar, and without any of the adjusting screws or platinum tips

**JAMES CARTLAND & SON, CABINET, BUILDERS, AND FURNISHING BRASSFOUNDERS, BIRMINGHAM.** LONDON SHOW-ROOMS: 40 HOLBORN VIADUCT.  
N.B.—The Show-Rooms, both in London and Birmingham, are replete with Patterns of every description of Brass Foundry. Buyers are respectfully invited to inspect same.  
**LONGBOTTOM'S PATENT ADJUSTABLE LOCK FURNITURE. MADE IN BRASS, WOOD, AND CHINA.**  
ADOPTED BY HER MAJESTY'S BOARD OF WORKS.



The attention of Architects is called to this Patent Lock Furniture as being the simplest and most reliable yet offered to the public, and whilst embracing all the features requisite in a perfect mechanical device, the total absence of defects usually found in Door Furniture still further enhances its value. In fixing insert the spindle into follower of lock, slip on rose, and screw the loose nut upon spindle until the right adjustment is obtained, then push on the other knob, the key passing through the nut and rose, turn rose half round and screw to door. They are as easily taken off as they are fixed, they cannot get out of order, and are suitable for all kinds of locks and every description of furniture.  
*Samples and Price Lists on application.*

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WINDOWS, DOORS, STAIRS.  
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which are to be found in the ordinary electric bells. The absence of these complications renders Jolin's patent bell simpler, less liable to get out of order, and much cheaper. The "Diamond" bell will ring either singly or in circuits, and requires fewer cells of battery than an equal number of bells working on the master-bell system.

The "Diamond" indicator is equally an improvement in its way. It differs in many respects from all self-adjusting indicators yet in the market, the pendulum action having been done away with and a balance spring substituted, thus getting rid of the very objectionable knife edges, needle points, and similar contrivances now commonly used with the pendulum. These contrivances are costly to construct, being of many parts,



and require nice adjustment: are easily damaged in transit and by rough usage, and rapidly rendered useless by dust, corrosion, and dirt. In the "Diamond" indicator these parts are entirely done away with, and a balance spring that cannot be affected by any of the above causes substituted, thus reducing the parts from several to one of a cheap kind that is absolutely certain in its action. The great freedom thus obtained by the balance spring allows of an electro-magnet of much less power being used; thus less battery current is required to work the indicator and bells, one or two cells being ample to work the "Diamond" indicator through 20 to 30 yards of ordinary electric bell-wire, sufficient for any ordinary house-work, saving by this means 20 to 40 per cent. of battery power.

Messrs. P. Jolin & Co. are also the patentees of the "Watchman's Detector," which is a system of boxes each containing an electro-magnet of peculiar construction, and a contact maker and breaker. The boxes are placed one in each place to be visited, and in the manager's room, locked up, is placed a registering instrument, driven by a clock, the man having to turn a key in each box as he goes his rounds. The



two advantages, therefore, are that the boxes are in series, thus saving wire and expense in fitting up, and that the man cannot sound the signal and register if he has not visited every box when he registers his round automatically in the manager's room. These boxes are arranged and fitted with a special device, that renders tampering with them impossible without instant detection: an important matter.

Messrs. P. Jolin & Co. are also makers and fitters of electric fire alarms, and are now extending the application of them at Stapleton Workhouse of the Bristol Incorporation of the Poor,

## THE FIRE AT THE GRAND THEATRE.

The destruction of this fine Building might have been PREVENTED by the USE of GRIFFITHS' "PYRODENE," which would have made the WHOLE of the SCENERY, STAGE, and its SURROUNDINGS—in fact, THE THEATRE in every part—ABSOLUTELY NON-INFLAMMABLE.

### GRIFFITHS' "PYRODENE" FIREPROOFING LIQUID

(NON-POISONOUS).

Transparent Liquid for Rendering Woodwork Uninflammable,

Without altering its appearance, and where Painting is not desired, such as Wooden Fittings in Exhibitions, Churches, Pews, Matchboarding, Theatre Scenes, Wooden Stairs, Joists, Beams, Floors, Factories, Stables, Mills, &c., in fact, Structures of an inflammable nature of all descriptions. Acts as a priming for new Woodwork for Paint or Varnish. Also for rendering Theatrical and Ball Dresses, Curtains, Paper, Felt, Canvas, &c., perfectly uninflammable.

Griffiths' Liquid penetrates the pores of the wood. It lasts as long as the wood itself. It prevents Dry Rot and decay in house timbers. It does not crack, peel, or rub off.

It is perfectly innocuous and free from smell. It will keep any length of time. Any one can apply it. One gallon will cover double that of any other priming.

AND

All Woodwork in new houses should be fireproofed with this liquid, the cost is so trifling in comparison with the preservation of the timber and freedom from risk of fire. If work is desired to be painted afterwards, Griffiths' Pyrodene Paint is best for the purpose.

### GRIFFITHS' "PYRODENE" FIREPROOF PAINT.

READY FOR USE.

NON-POISONOUS.

ALL COLOURS.

This Paint is manufactured for preservative and decorative purposes equally as for its FIRE-RESISTING qualities. The Fireproof Paint and Fireproofing Liquid is used at some of the principal Theatres in the United Kingdom.

#### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIRS.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 32 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIRS.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly, S. C. LOWE & SON.

CHEAPER AND MORE DURABLE THAN ORDINARY PAINT.

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they being the original contractors to that Union and others. The catalogue published by this firm is a most comprehensive one, containing every information about electric appliances of all kinds, and has been most favourably reviewed in the technical journals.

#### RAYNER'S PATENT DOOR RETAINERS.

THESE retainers are the invention of Mr. George H. Rayner, of 43 Southampton Buildings, Chancery Lane, London, patent agent, and were designed to obviate the use of springs in obtaining a perfectly automatic action. This is successfully obtained, and they are now manufactured in various forms, and are about the best articles of their kind at present in the market. The construction is simple, and there is nothing to

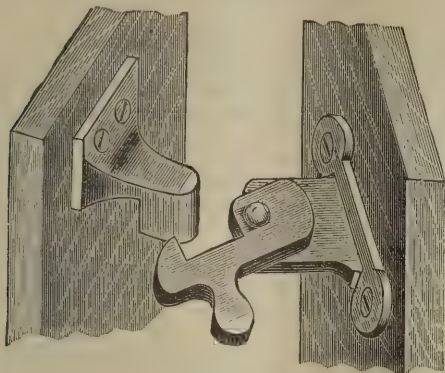


FIG. 1.

get out of order. A catch is mounted on a plate by means of a pin, upon which it moves for a limited distance, and has a rounded nose, so that the action of the door in pressing against it opens the catch to receive the door, which is afterwards pulled round by the same movement and the door is held securely. The retainers have no springs, and are easily fixed without skilled labour. Figs. 1 and 2 are to hold swing doors open, instead of the hook and eye at present used. Fig. 1 is fixed at dado height, and fig. 2 is for fixing on floor, and is made with a broad lip, so that it may be released by the booted

foot. They are so made as to be easily adapted for either right or left hand doors, by adjusting the screw pin. To hold the door open it is simply pushed against the retainer, and is at

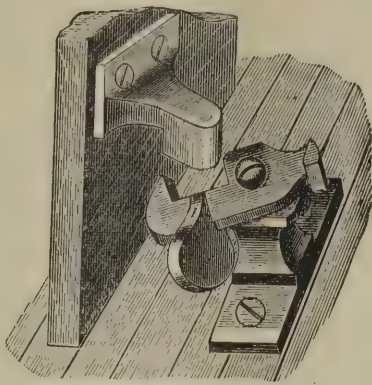


FIG. 2.

once securely held. Fig. 3 is a fastening to secure the first closing half of folding cupboard doors, instead of a sliding bolt. It is most effective in its action and cannot be picked

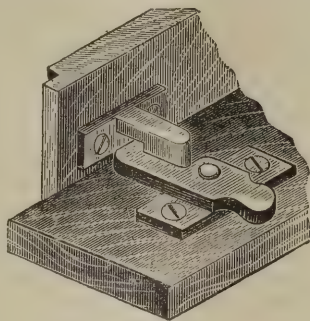


FIG. 3.

like an ordinary bolt; it is well and cheaply made. These retainers are being largely used, and, among other places, are fixed at the Horse Guards, Whitehall, London, and the War

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TO THE BANK OF ENGLAND AND ITS BRANCHES,

*Including the New Law Courts Branch now in course of Erection.*

### IMPORTANT COMMUNICATION. — WHITELEY'S FIRE.

WILLIAM WHITELEY, Westbourne Grove, London: October 12, 1887.

HOBBS, HART & Co., Limited.

GENTLEMEN,—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting powers of your Strong-room Doors and the Safes.

The recent fire at my establishment, in my opinion, subjected them to the greatest possible test, and through all they proved invulnerable. The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.

You will be pleased to hear that it has been decided to adopt your Patent Clutch Rebated Doors for all the party walls in the new buildings now in course of erection.—I am, Gentlemen, faithfully yours,

(Signed) WILLIAM WHITELEY.



Office have given instructions that they be fixed at the new officers' quarters and mess establishment now building at Aldershot, by Messrs. Martyn, Wells & Co., contractors. There are other forms of this invention for sashes, casements, wardrobes, &c., which we have not space here to describe or illustrate. The retainers are manufactured by Messrs. May & Padmore, of Birmingham.

### A NEW IDEA IN HOUSE BUILDING.

ACCORDING to the *Lancet*, an American physician, Dr. Gouverneur M. Smith, following in the footsteps of Dr. B. W. Richardson, has published an interesting little paper on the advantage of utilising the upper storeys and roofs of modern houses in the interests of health and recreation. After alluding to the defects of the present system of building, with its frequently dark, dusty, and overcrowded attics, he proceeds to suggest what is in several ways a better arrangement. This consists in securing free ventilation by means of shafts, in a great extension of window surface, and in providing convenient access to the roof, which is to be laid out as a pleasure garden. The roof space thus gained would form an agreeable promenade in summer, while the bright and airy upper rooms would be equally suitable for nurseries or play-rooms. Dr. Smith dwells on the amenities afforded by such a well-kept roof-garden to the dwellers in tenements. At the same time he is not forgetful of possible inconveniences arising from a promiscuous association of neighbouring tenants on this common ground; but he argues that, as a rule, the scheme is not open to any really grave objection on this account. The point is necessarily one which experience alone could settle. So far as we can learn, however, a similar principle in house-building already adopted in this country has not been discredited by any serious difficulties of the kind in question. It has always appeared to us, however, that in the event of fire the very thorough ventilation allowed by this plan of construction could not but tend to assist the conflagration. This drawback might, perhaps, be met by some specially contrived safeguard. The advocates of the project are also, doubtless, prepared to guarantee that houses constructed on this plan will not be too cold or draughty; for, unless objections like these can be satisfactorily disposed of the proposed reform is not likely to prove as useful in practice as it looks plausible on paper.

### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, Consulting Patent Agent, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

9466. Thomas Tucker, for an "Improved automatic sash or window fastener." June 29, 1888.

9480. Joseph Tollerton, for "Improvements in apparatus for speedy application of gas to wing lights, ground rows, and to the stages of theatres and public halls generally." June 29, 1888.

9484. Ferdinand Bosshardt, for "Improvements in bath rooms." June 29, 1888.

9515. Louis Jules Malaval, for "An improved apparatus and process for copying writing and designs of any description." June 29, 1888.

9559. Charles John Howe, for "The production of a cement or plaster suitable for rapid fireproof plastering, and for all other purposes for which Keene's and other similar cements or plasters are used, and which is capable of being produced at about the price of ordinary plaster of Paris." June 30, 1888.

9560. William Eddington, for "Improvements in mortar mills or edge runners." (Complete specification.) June 30, 1888.

9570. Thomas William Helliwell, for "An improved method or process of treating steel, iron, or any combination of such metals to prevent their oxidising, rusting, or corroding." July 2, 1888.

9591. Edward Thorp, for "Wind and water bars for meeting rails, top and bottom rails of sliding sashes, top rail and stiles of casement sashes, top rail and stiles of doors." July 2, 1888.

9594. Leon van Parys, for "Improved means for raising and lowering windows." July 2, 1888.

9612. Herbert John Haddan, for "Improvements in baths." July 2, 1888.

9615. George Henry Rayner, for "Improvements in mounting incandescent electric lamps." July 2, 1888.

**NORTHERN**  
FIRE LIFE  
ESTABD 1836  
**ASSURANCE COMPANY**  
HEAD OFFICES  
LONDON & ABERDEEN  
ACCUMULATED FUNDS (1888) £ 3,421,000.

### HILL'S Prize Medal GAS BATH.

Awarded FIRST PRIZE by Royal Polytechnic Society, 1884.



A Warm Bath ready in 15 minutes, at a cost of one halfpenny. Easily fitted in any house. Price from £4 4s. complete, including fittings. Compare the cost of this with the ordinary method of fitting-up bath-rooms. No house should be without one.  
Sole Manufacturers: ARDEN HILL & CO.,  
ETNA FOUNDRY, 14, 16, 18 Constitution Hill, BIRMINGHAM.  
Makers also of the Patent Acme Gas Range, Asbestos Gas Fires, and Acme Bath-Heaters.

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**MUTUAL FIRE INSURANCE CORPORATION,**  
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9628. Frederick Parker, for "A new or improved holder for blind cords and other cords or ropes." July 3, 1888.
9644. Samuel Bags, for "An improved dust and draught preventer for the thresholds of doors." July 3, 1888.
9645. Albert Taylor, for "Improvements in the boxes of moulds for pressing bricks." July 3, 1888.
9646. James Gregson, for "Improvements in clips, or hangers and heads, for rainwater, soil, stove, and other pipes, which are also applicable for other purposes." July 3, 1888.
9673. Adolph Grupe, for "The manufacture of a novel material, suitable as a substitute for leather, linoleum, india-rubber, and other like substances, for floor coverings, hangings, roofing, and other purposes." July 3, 1888.
9682. Thomas Cutlan, for "Improvements in machines for ornamental turning and shaping." July 3, 1888.
9733. Elliott Emanuel, for "A double fan for wash-out closets." (Complete specification.) July 4, 1888.
9751. Frederick Henry Smith, for "Improvements in caps or heads for ventilating and flue shafts." July 4, 1888.
9760. Richard William Pyne, for "A new or improved protective safety door-fastener for internal use." July 4, 1888.
9761. James Stewart Palmer, for "Plastic wall-decoration composition." July 5, 1888.
9763. John Samuel Rigby and Andrew Macdonald, Liverpool, for "Improvements in the manufacture of cement from the calcium sulphide waste of Le Blanc soda manufactures." July 5, 1888.
9780. David Priestley, for "Improvements in racks applicable for holding the operating cords of window blinds." July 5, 1888.
9786. Henry Cullabine, for "Improvements in attaching door-knobs to their spindles." July 5, 1888.
9792. Walter Stephenson, for "Improvements in automatic atmospheric door-closing apparatus." July 5, 1888.
9803. Alfred James Hogan, for "An improved method of building construction." July 5, 1888.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

11534. Théodore Marie Joseph Truchelot and Jean Nicolas Truchelot, for "A new or improved process and apparatus for the treatment of sewage and other matters for extracting ammonia and oxidising sulphur compounds." August 24, 1887.
4384. Henry William Swift, for "Improvements in boiler and other taps." March 22, 1888.

7327. Henry George Carew, for "Improvements in bricks and building blocks." May 17, 1888.
7420. James Tait, for "Improvements in inlet-horns for water-closets, water-closet pans, or basins and urinals." May 19, 1888.
7987. George Cecil Farr, for "An addition to or appliance for buildings or structures, for enabling the interior of rooms or compartments to be observed from another room or compartment or place exterior to such rooms or compartments." May 31, 1888.
8040. Benjamin Robinson, for "Improvements in water-closets." June 1, 1888.
8133. George Harvey, for "Improvements in stench-traps." June 4, 1888.
8199. George Withycombe, for "A self-acting flushing-tank applicable as a water-meter." June 5, 1888.
8338. Henry John Lansbury, for "An improved weather-bar for doors and windows." June 7, 1888.
8399. John Sheldon, for "Improvements in metallic framing for windows, hot-houses, conservatories, and other light structures." June 8, 1888.
8403. William George Macvitie and Isaac Whitehouse, for "Improvements in the manufacture of mounts for the handles of door-knobs, and other similar articles." June 8, 1888.
8470. Charles Young, for "Improvements in and in connection with latches." June 9, 1888.
8542. George Anderson, for "Improved method of an apparatus for raising girder, trusses, and the like members of lofty structures." June 11, 1888.
8675. Edward Bagaley Williams, for "Improvement in the construction of cast plunge-baths, and other cast baths." June 13, 1888.
8693. Charles Baker, for "Improvements in arrangements for drying slurry for the manufacture of cement." June 13, 1888.
8861. Jacob Wright, for "An improved hinge." June 16, 1888.
8960. John King, for "Improvements in flushing cisterns or water-waste preventers." June 19, 1888.
9006. Henry Berkeley, for "Improvements in a cement or plastic material for linoleum or floor covering." June 20, 1888.
9142. William Griffiths, for "Improvements for the utilisation of the flow of water in sewers and main drains of towns, and other places, for obtaining motive power." June 22, 1888.
9163. Thomas William Twyford, for "Improvements in or addition to water-closets." June 23, 1888.

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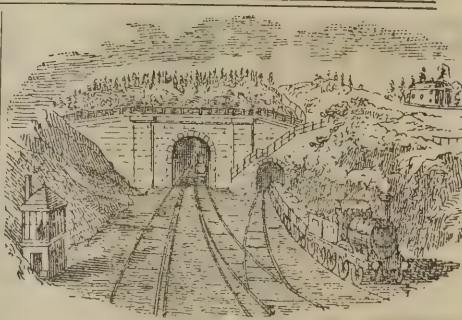
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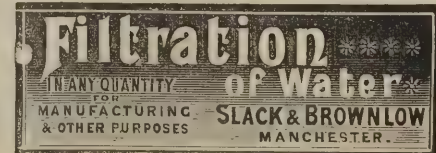
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## COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may at any time within two months from the date of this journal, give notice at the Patent Office in the prescribed form of such opposition.

10950. Joseph Henry Bean & William Gaine, for "Improvements in apparatus for closing doors and preventing slamming-to of the same." August 10, 1887.

11103. Frederick William Jones, for "An improved method of fixing wood linings and the like for walls and ceilings." August 15, 1887.

11957. James Frederick Wiltshaw, for "Improvements in the mounts of door and other knobs." September 3, 1887.

11961. Benjamin Turner, for "Improvements in door springs." September 8, 1887.

12014. Griffith Brewer, for "A new or improved automatic apparatus or appliance for closing doors." September 5, 1887.

12991. William Archibald Murray, for "Improvements in gates." September 26, 1887.

194. William Fraser, for "An improved mouthpiece for speaking tubes." January 5, 1888.

8003. John Langstaffe and Henry Daniel Peckover, for "An apparatus for purifying and softening of water and preventing incrustation." June 1, 1888.

8283. William Allen, for "Improvements in fastening cords together, specially applicable for fastening endless blind and other cords which work in grooved pulleys." June 6, 1888.

## PATENTS SEALED, JUNE 6, 1888.

6256. William Kneen, for "Improvements in latches for doors and the like." April 29, 1887.

6820. William Gwinnett, for "An improved eaves plate, with or without gutter, for use with corrugated roof and wall coverings." May 10, 1887.

7036. Frank Trier, for "Improvements in stone-working machines." May 13, 1887.

8361. Henry Belcher, for "An improved machine for pressing bricks." June 10, 1887.

8756. Joseph Thomas Harris, for "Improvements in cocks, taps, valves, and other like appliances for stopping or controlling the flow or passage of water, steam, gas, or other fluid." June 17, 1887.

8849. Samuel Bastow, for "An improved door cramp." June 20, 1887.

326. Mark Henry Blanchard, for "Improvements in terra-cotta fireproof construction." January 7, 1888.

3761. Christian William Cook, for "An improved sash-holder." March 10, 1888.

## ABRIDGMENTS OF SPECIFICATIONS RECENTLY PUBLISHED.

"Improvements in spring roller-blinds." John Mitchell, No. 11010 (1887). A spring roller of the usual construction is employed; to one end thereof is adapted a pulley, one side of which is formed with ratchet teeth. Into these teeth tapes a pawl, which is suitably pivoted above the roller, and is formed with a curved extension, having at the end an eye, through which passes the blind cord. The position of the eye with regard to the pulley to which the cord is attached is such that, when the cord is lightly pulled, the pawl will be withdrawn from the ratchet, and the blind will be free to rise under the influence of the spring.

*Claim.*—*I.*—The improvements in spring roller-blinds herein shown and described, whereby one cord is made to serve to unroll the blind, unlock the catch, and regulate the speed at which the blind is to be raised as set forth.

"Improvements in connection with domestic fire-grates." T. A. Bennett, No. 6588 (1888). This invention consists of an improved arrangement of combined blower and canopy and means for adjusting and supporting the same at various heights above the grate bars. To this end a metal plate is employed with a canopy or hood formed with or attached to its lower side. This plate forms the combined blower and canopy, and is fitted in recesses or slideways formed in or attached to the cheeks of the frame on either side. The plate can be moved up and down in its slideways and adjusted at the height registered.

*Claim.*—A plate constituting a combined canopy and blower for a domestic fire-grate, said plate being supported and adjusted substantially in the manner and for the purposes herein described, and as illustrated by the annexed drawing.

"Improvements in excavators." J. H. Simpson and Saml. Porter, No. 10754 (1887).

*Claim.*—Excavators with a fulcrum adapted to be moved in a direction parallel to the longitudinal axis of the jib for the purposes set forth.

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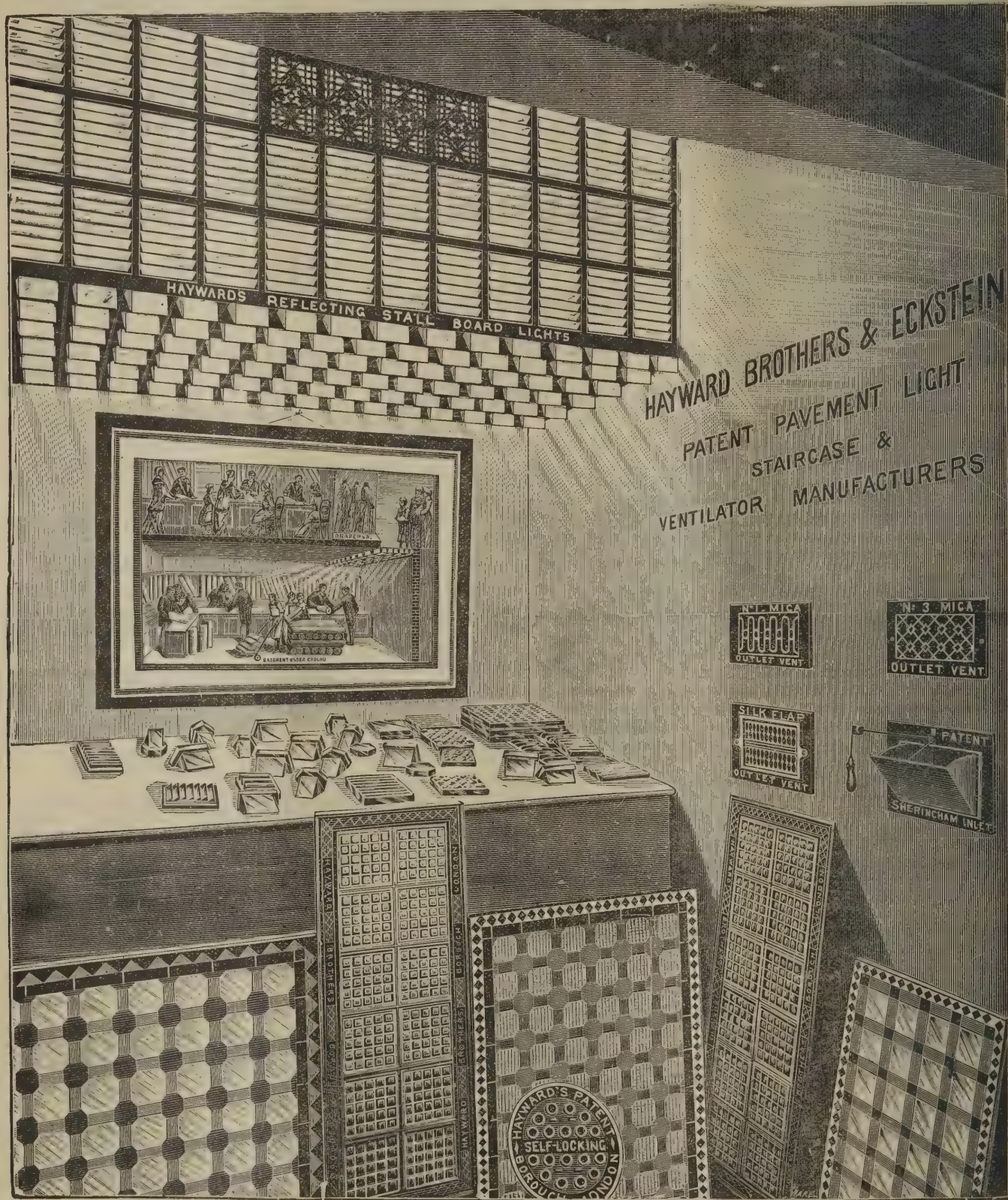


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 Friday, July 13, 1888.



# The Architect.

## THE WEEK.

THE Leeds School Board have taken a further advantage of the competition between architects. It is known that Mr. WILLIAM LANDLESS, who quite recently held a good position as an architect in Glasgow, was compelled to accept employment as clerk of works in the Higher Grade School in Leeds at a salary of five guineas a week. His capabilities being known, and as he was supposed to have insufficient employment for all his hours, Mr. LANDLESS was directed to prepare plans for an extension of the Bewerley Street School, which was to cost about 3,000*l*. The building had been designed by Mr. CORSON. In a case of this kind, what is a stranger in Mr. LANDLESS's position to do? Is he to throw away a chance of establishing himself as an architect in England, or is he to sacrifice his prospects as an individual to the interest of the profession? While making every allowance for the difficulties before him, the majority of architects will say that Mr. LANDLESS should have taken the latter course. Having the post of clerk of works, he ought to have recognised the limitations of the duties, which in England exclude the preparation of plans. With no less reason he might have supplied plans if he belonged to the staff of a builder. Nor would his adoption of the more unselfish course do him any injury. Supposing, at the worst, Mr. LANDLESS was compelled to resign his post, may we not believe that one no less advantageous would be found for him without loss of time? As it is, he runs the risk of being reckoned as a man who will do work at a low rate; and with that sort of reputation an architect will find few people who will pay him five per cent. Indeed, it may be doubted if Mr. LANDLESS will serve his own interest with the School Board of Leeds. Already some of the members doubt the policy of paying him five guineas a week, considering that 3*l*. or 3*l*. 10*s*. is an adequate salary. It is not unreasonable to assume that when his present engagement ends he will be expected to combine the duties of architect, surveyor, and clerk of works for a much lower sum than he now receives.

MR. LANDLESS's action may have the effect of serving men who are satisfied with being recognised as clerks of works. It is often said that young architects, after their days of pupilage, could not do better than become clerks of works. But henceforth an architect will be chary of selecting anybody who might be tempted to supersede him for a post of that kind. Although Messrs. KELLY & BIRCHALL have accepted the commission for a new school in Leeds at 4 per cent., including quantities and other charges, an apology was made to the School Board when their appointment was proposed, that so much outlay was necessary because the clerk of works was sufficiently occupied with other duties. What has occurred in Leeds may be repeated elsewhere unless precautions are taken. We hope the new arrangement will be confined to Leeds, but School Boards are not indisposed to put the screw on architects.

THE venerable ANTOINE ETEX, who died this week, was prominent among French sculptors during many years. His position at one time is suggested by his selection to execute two of the large groups of the Arc de Triomphe. They are the *Resistance* and the *Peace*. One represents a young soldier going forth against the invaders, whilst a wounded man embraces his knees. Behind, a horseman falls from his horse and above is a great genius. The companion shows a warrior sheathing his sword, his companions, also, turning to peaceable pursuits. With all their merit they are not to be compared with the noble group by RUDE, which is the most admired of all parts of the structure. But PRADIER—who was the teacher of ETEX—was also unhappy in his work at the Arch. ETEX was one of those sculptors who seem to be emulous of the power of painting in expression. His big group, representing the City of Paris beseeching Heaven to stay the cholera, was more pictorial than sculptural in spirit. It was almost

too realistic in the representation of death. The work by him which is best known in England is the group of CAIN and his family, which was powerful although ungraceful.

A GENERAL meeting of the Society of Architects is to be held on Tuesday next, at St. James's Hall, when various changes in the rules will be submitted. In one it is proposed to give the Council discretion to expel any member who acts contrary to the dignity of the profession, the offender having the right to appeal to a general meeting. Recent revelations have suggested the value of such a rule. Alterations are to be made in the arrangements for election of members and associates. The form for candidate members must not only be signed by two members, but one of them must testify to his knowledge of the candidate and his works. The Council are to make further inquiries if necessary. Henceforth the entrance fee is proposed to be one guinea, and members who are a year in arrear with subscriptions can be struck off the register. As the Society of Architects has gained position, it is to be expected that admission to the Society will become more difficult than heretofore.

In the last quarterly statement of the Palestine Exploration Fund, Dr. SCHUMACHER relates the history of the new settlement on the site of the ancient Cæsarea. It appears that immigrants from Bosnia, after the Austrian occupation, fled to the Ottoman Empire, and found a refuge at Cæsarea, where extensive parcels of land were granted to them by the Sultan. This place now contains forty-five families of Bosniaks, who erected solid dwellings with tile roofs, which impart to the place quite a European aspect, entirely different from the poor huts of their fellaheen neighbours, but their roads remain in a primitive state. No general plan was observed, and frequently disputes arose amongst themselves as to the lots they occupied within the city wall, still existing from the Middle Ages. Cæsarea is a tempting field for the explorer, but the new inhabitants do not look with favour on his work, as they are afraid of foreign influence, even under the guise of archæology.

MESSRS. PETER SPENCE & Co., of Manchester, propose that, as the English law of lights is radically unjust, the various Christian Churches should set their heads together and create such public opinion in favour of commercial arbitration that no respectable firm would care to settle disputes about ancient lights, and other matters, in any other way. Messrs. SPENCE were lately defendants in an action which revealed to them the state of the law. A company of brewers occupy a public-house built across the north end or *cul de sac* of a street 36 feet wide in Manchester, the whole of their windows receiving the full uninterrupted light flowing down the street. Along the east side of this street there is a wall as high as the public-house, and forming the boundary of Messrs. SPENCE's property. Over the wall a new building was erected, and on its completion they were informed by the brewers that the light of the public-house was interrupted, and the removal of the building was demanded. Messrs. SPENCE, believing their neighbours were under a delusion, proposed that the matter should be settled amicably by arbitration, each party to choose a valuer, the two valuers to decide between them whether there was actual damage, and if so to assess its amount, an umpire being of course first jointly appointed, whose decision should be final. This was not agreed to; a trial came on, and the brewers were awarded 25*l*. paid into court, but were adjudged to pay costs on both sides. The case is only one among many in which the lawyers carry off the prize. The Christian Churches will hardly, we fear, adopt Messrs. SPENCE's suggestion, and get up an agitation for the reform of the law respecting ancient lights. But they have an alternative which seems more feasible: it is that the Manchester Chamber of Commerce, in conjunction with other Chambers, should move for the abolition of the English and the adoption of the Scottish law of lights, which allows a man at any time to erect any kind of building upon his land, unless he can be shown to have done it from malice, emulation, or other unjustifiable motive.



## SKETCHES OF ARCHITECTURE.\*

COMPLAINTS over the shortcomings of architectural education in this country are constantly heard, and in consequence the superiority of the foreign systems is supposed to be manifest. In one way we may, however, be said to excel the rest of the world, for if any advantage is to be derived from representing ancient work, the English architects may be said to have a monopoly of it. In foreign schools careful drawings of prescribed examples may occasionally be seen, but the production of them is very different to the sketching which is carried on by English students. Some may say that greater benefit is to be derived from such attempts at the reproduction of ancient buildings as are premiated in France than from filling a sketch book with bits of detail, or making picturesque views. Into that question we need not enter. What we maintain is, that the foreign student rarely repeats his experiments in reproduction, whilst in England the habit of sketching is not confined to the period of pupilage. Indeed, with some a sketch book might be supposed to be a means towards rejuvenescence.

In what other country can a series be found that is comparable to the volumes of the Association Sketch Book? French architects might be supposed to be better able to produce one or more collections of the kind, for there is, or ought to be, a sort of solidarity between the hundreds of men who issue from the schools of Paris. But although a spirit of that kind is from time to time exhibited at big dinners, it has not given rise to anything which can be considered as a memorial of the veneration for the past which the old students were supposed to imbibe in their classrooms. Here in England, where we are believed to have no systematic teaching, and where, according to some censors, we are incompetent to appreciate the true beauties of ancient architecture, we find that the Architectural Association from year to year can have the command of an unfailing supply of representations of architecture, and that the quality no less than the number is kept up. When volumes equally good can be produced by foreign architects, we shall then be convinced of the advantages of foreign processes for exciting enthusiasm for the art, but, so long as the Association Sketch Book is unique, we may console ourselves with the belief that in some things we are not inferior to our Continental friends. The last volume of the Association Sketch Book has so much spirit in its pages that it might be the first instead of the seventh of a new series. The editors and committee appear to have been more exacting in the selection of subjects, and the volume as a whole will sustain a comparison with the best of its predecessors. The title-page suggests that the volume is a sort of Jubilee record, and as such it is far superior to the majority of things on paper by which that period was commemorated.

The title-page is the work of Mr. W. G. B. LEWIS, and has that elaboration of detail which is common to all his drawings. Some of the titles in preceding volumes are no more than indications of an idea, and occasionally an ambitious one, but here the execution is perfect. In the border, arms and other emblems of Great Britain and the Colonies are introduced, and the double printing adds to the effect. The seventy-two drawings which follow are taken from England, France, Belgium, Holland, Germany and Italy. They are not all recent sketches, and some have been already published.

Mr. WOODWARD leads the way with four sketches, one being of the porch to the Abingdon almshouses, which is adorned by the remains of mural paintings. Pakenham Manor, Suffolk (Mr. GARRATT) dates from 1622, but the gables might be taken for later work. Mr. PAUL represents the Gateway of Battle Abbey in outline, and entirely in free hand. Blyburgh Church (Mr. RIX) is an interesting example of a Suffolk church, in which flint is skilfully used. Mr. T. L. WORTHINGTON gives some good Gothic detail from the Mytton Chapel in Bredon Church, and from St. Peter's Hospital, Bristol, 1607, in which good and bad detail are commingled. The three drawings of Broadwater Church, by Mr. ALFRED HART, give a clear idea of a building which contains fine wood-

work. The Pharos on St. Catherine's, Isle of Wight (Mr. MARVIN) is remarkable as an example of an early lighthouse. It appears that formerly, in addition to the tower which has survived, an oratory and hermit's cell existed. The tower is 34 feet 3 inches in height, and is 830 feet above the sea. Tranby Chapel, Cirencester, is shown in two sketches by Mr. PAUL, which give the general effect in a style that offers temptation to become careless. Elm Church, by Mr. WILSON, appears to be traced from a more elaborate drawing, but the plate shows the main features of the building. The church at Etchingham, by Mr. PAUL, suggests that he is stronger with the lead pencil than in etching, but his chancel screen from Sawbridge Church is an excellent measured drawing. Mr. F. MITCHELL supplies some work from Huddersfield, Rochdale, &c., which is not remarkable except for age. Mr. GARRATT draws the quadrangle of Ightham Mote House, which is not, however, the most interesting part of the building. His sketch of King's Sutton Manor House shows a good type of residence. Mr. BIDLAKE's view of the east transept of Lincoln Cathedral is telling, but it appears to have suffered in the transferring. Two measured drawings from the cathedral are by Mr. PITE and Mr. HOOPER. Mr. DUKE has a part of the vaulting of the Chapel of HENRY VII., a very difficult subject to represent in outline. The chest in St. Mary Overie, drawn by Mr. V. T. JONES, is curious, for the carver evidently took some building as a model. A bay of St. Bartholomew's Church, Smithfield, is drawn by Mr. SELBY in a bold line. One peculiarity noted is that the voussoirs of the triforium are only partially supported by the shafts. The view of the Priory Church, Great Malvern, is from a pencil sketch by Mr. WALTON, worked up with colour, and conveys a notion of that noble building. The pen drawing of Pershore looks flat beside it. Mr. GOTCH has a careful measured drawing of Rushton Hall, and a sheet of drawings containing many scraps from Wimborne, Salisbury, &c. The four pages of tombs from Salisbury Cathedral, by Mr. G. C. WALLACE, are excellent. The beautiful detail is rendered with a sense of its value. From Mr. A. B. MITCHELL's sketches, it might be concluded that his forte was in rendering the picturesque; but his two sheets of measured details from Tilly Church show as painstaking a spirit as could be desired. Mr. NEEDHAM WILSON has also three capital plates of the same kind from West Walton Church. Mr. NEVINSON's drawings of wood-work complete the English subjects.

Mr. OAKESHOTT has a fine drawing from the Château d'Azay le Rideau, in which birds—probably from the owner's crest—are introduced in the capitals, and again in the frieze. A panel from the staircase of the Château de Blois shows how easily a capital letter can become a subject under the hand of an artist. Mr. OAKESHOTT also furnishes a measured drawing of a part of AGNES SOREL's house in Orleans, and one of a less known but more interesting work—a loggia in a farmyard near Dieppe. It is Renaissance in style, but from the way some heads are introduced a Gothic carver might have had a share in it. Mr. MILLARD has two views of the farmhouse, which was once a grand château. Mr. MITCHELL sends two views of Laon, but, owing to the reduction, they do not appear equal to his sketches from the Palais de Justice at Rouen. Mr. RIX has done better work than his drawings of St. Pierre, Lisieux. The sheet of sketches by the late E. W. GODWIN is characteristic of his way of giving emphasis to the parts of a building which struck him as being suggestive. Another wayward artist is recalled by F. C. DESHON's sketch of Notre Dame, Senlis. It was evidently hurried in execution, but the light and shade is skilfully rendered. We published a reproduction of Mr. MARVIN's drawing of a church at Veselay when it was made, but fourteen years have not much affected the lines. In its perfect state the building represented must have been attractive, both from its design and from the quantity of sculpture that was introduced.

Belgium is represented in the Sketch Book by a copy of Mr. SPIERS's drawing of Tournai Cathedral, which appeared in an early number of this Journal. Mr. AMBLER contributes the three Dutch drawings of houses in Haarlem, Leyden, and Middelburg, the last having modern plate-glass windows and a new and commonplace door! From Germany there are four vigorous sketches by Mr. A. B. PITE, to which a weird appearance is given, and some

\* The Sketch Book of the Architectural Association for 1887.



sketches of evangelistic and other figures in needlework drawn by Mr. VACHER.

There are seventeen plates from Italy. Mr. SELBY has a rough sketch of the doorway of St. Francesco, Bologna. Mr. MARVIN has drawn four types of campanili, and Mr. E. G. HARDY shows three from Florence, drawn with great delicacy. A second drawing by Mr. HARDY is the elegant campanile of Prato Cathedral, which looks as if it could be easily transformed in a later Italian style. Mr. HORSLEY suggests the detail of the pulpit in San Miniato, Florence, which might have been made out of Classic fragments; and his skill as a figure-draughtsman is seen in two Sibyls from the Sistine Chapel, which are most difficult as tests. Mr. BIDLAKE gives detail of the ornament on the doorway of Doria's House in Genoa. The marble pavement in Siena Cathedral has inspired some drawings. Mr. A. ROBERTSON has drawn the badges of the thirteen cities which are introduced among the ornamentation, Siena having the central place. Mr. SELBY sketches part of the *Moses Striking the Rock*, which is one of the earliest parts, while Mr. LONSDALE draws parts of the borders with his habitual neatness. A plate by Mr. LONSDALE from the Capella Reale is a model of a decorative sketch in colour. Mr. DUKE gives a vigorous sketch of arching from Pisa, and Mr. LEACH has one from the Council House, which is not successful in the ornamentation.

The contents will suggest the variety and interest of the last volume of the Association Sketch Book, and, regarded as a means for the acquirement of architectural knowledge, there can be no doubt that assisting in the preparation of the work is of great importance to the contributors.

Under the satisfactory title of "Remnants of Old English Architecture,"\* Mr. T. LOCKE WORTHINGTON has produced a volume of plates from his own drawings, some French buildings, appearing as a sort of supplement. A work of this kind has the advantage of suggesting what appears most interesting in the eyes of the author, and will serve as a guide to others who may wish to go over the same ground. Mr. WORTHINGTON classes his drawings of English work in three divisions, viz., thirteenth-century, Rectilinear and "Picturesque." Under the first he gives eight plates of Wenlock Priory, which is a sort of epitome of the style. A plate from Stone Abbey exemplifies the beautiful carving, and parts of Bolton Abbey, Peterborough Cathedral and Pershore Abbey are also introduced. Manchester Cathedral is too often undervalued. The stalls which Mr. WORTHINGTON draws are richly carved, and other parts of the woodwork are not without value. A buttress from Haddon Hall illustrates the character of work of that class in the period. There are many drawings of timber houses, and we can say that all the examples are selected with fine judgment. One of the interesting features of the work is the progress which it exhibits in Mr. WORTHINGTON's own drawing. The book is adapted for the architect's library, and it is also fitted for the study of amateurs, and all who are proud of English architecture.

### THE ARMS OF BATH.

THE following is a second contribution to the *Bath Herald*, from Major Davis, F.S.A., on the heraldic question of the civic arms:—

My paper on the "Civic Arms of Bath," read before the Corporate Property Committee, has been in print for a fortnight. Within this time it has had to stand the fire of hostile critics and the decision of the Somerset Herald. The essential point of the paper, viz., the correct and authorised representation of the civic arms, has been confirmed by the Somerset Herald, and not seriously attacked by my opponents, who, by skilfully making a diversion on outlying points, which it is not necessary for me to defend, have endeavoured to raise sufficient dust to obscure the central and impregnable position on which I take my stand. Two points in my paper on which I laid no stress, and which I threw out tentatively in the shape of queries, I very gladly make a present of to the opposition. These trifles are as follows:—1. The spurious arms are noted in the College of Heralds as the unauthorised invention of an engraver. To this statement I added in brackets, with a query after it, "The Dutchman, Van Houe, I believe, 1610" (?). 2. The discarded maces in 1708, I said, "are, it is believed, those now

carried before the Mayor of Stratford-on-Avon." Neither of these points was essential to my argument, and neither of them was proclaimed with my authority, and therefore I have no compunction in throwing them both overboard.

With reference to the reply of the Somerset Herald, the only question which he was officially required to answer was, What are the authorised civic arms of Bath? And his answer is that the only arms authorised by the Heralds' College are those sanctioned in 1623. This point was fully sifted by the Corporate Property Committee in 1862, and was settled then precisely as it is now. At the present time, however, it is no secret to those who are behind the scenes, and can read between the lines, that personal feelings are mixed up with archæological and heraldic questions, which it suits the purpose of one or two restless and unrelenting gentlemen to use as a stalking-horse, under the presentation of which they may shoot their arrows; and the letter of the Somerset Herald affords strong internal evidence that he is replying, not simply to the public and official communication of the town clerk, but also to the private and unofficial communication pressed upon him at the same time by my relentless opponents, in whose interest he makes some statements which seem scarcely to rise above special pleading.

(a) The Somerset Herald, Mr. Burke, reminds me, through the town clerk, that the visitation of heralds in 1623 was not the last visitation (as I stated in the hurry of the moment), one having been held so late as 1687. I thank him for the correction, which, however, does not modify my position, as the arms authorised in 1623 were not affected by the later visitation.

(b) While allowing that the arms sanctioned in 1623 are the only authorised ones, Mr. Burke reads them heraldically slightly different from my reading. In the original visitation they are certainly to be read according to my rendering, which is also that of Mr. Planché, the Somerset Herald appealed to in 1862. In any case, however, the essential fact as to the only authorised civic arms is quite independent of any difference between Mr. Burke and myself as to the reading of them.

(c) Mr. Burke sending an emblazonment of the only authorised arms, which we will call A, encloses also two other coats of arms, which we will call B and C; and says that if A had not been allowed in 1623, he has no doubt that the College of Heralds would have sanctioned either B or C. Really, this is an extraordinary piece of reasoning, and is about as serious as if one were to say that either Lambert Simnel or Perkin Warbeck might have established his claim to the throne of Henry VII. if the rightful occupant had not maintained his seat, and if his claims had not been allowed to be superior to those of the pretenders.

(d) Lastly, Mr. Burke is of opinion that when either B or C version of the civic arms is in possession, it should not be replaced by A. It may be fairly asked whether Mr. Burke is not travelling beyond the sphere of his recognised authority in making this statement; and he is evidently not aware that the coat of arms recently removed from the Guildhall is neither B nor C, but a fourth version, which we must call D.

Having now disposed of the letter of the Somerset Herald, who confirms my position as to the only point at issue between myself and those who would endeavour to establish an authority for the conventional arms, I will now turn my attention to the defence of the spurious arms set up by local champions. The points of the defence are as follows:—The conventional arms are (1) more ancient, (2) sanctioned by usage and prescription, (3) more appropriate and significant, (4) more artistic; and I propose to deal with them seriatim.

(2) Even if we grant the fact insisted on, the antiquity of a counterfeit does not make it genuine; but though I am not called upon to argue this point, it may at least be fairly doubted whether the conventional arms have even the privilege of greater antiquity. They are said to date from 1568, but the visitation of heralds made in 1623 is thus endorsed:—"Visitation of H. St. George, Esq., Richmond Herald, and Sampson, Blewmantle, marshalls and deputies to William Camden, Esq., Clarenceaux King-of-Arms, of the south-east and west parts of the realms of Great Britain, from the river of Trent, anno domini 1623, with the visitation made anno domini 1565." Under the head of Bath is firstly a drawing of the city seal as now in use, secondly the Mayor's seal, and thirdly the civic arms as given to me by my friend Mr. Planché, when Rouge Croix Pursuivant, and beneath all this occurs the following entry:—"City incorporated by King Coel and King Edgar before the Conquest, confirmed Ed. 3 5th year of his reign, 5th Ric. 2 likewise ratified and confirmed by K. H. 5th in the 2nd year of his reign, and which confirmations were ratified and reincorporated by the late Q. Elizabeth the 4th day of September in the 32nd year of her reign . . . and at the time of this present visitation 30th day of August, 1623, was Robert Frye Maior Nicho. Hyde Recorder." The names of the remainder of the Corporation follow. The visitation of 1623 confirms all previous visitations, and any changes or grants of arms subsequent to 1528 are noted in the visitation book; so that it might be argued that all arms confirmed in 1623 with-

\* *Remnants of Old English Architecture*. By T. Locke Worthington, F.R.I.B.A. London: Sprague & Co.



out any specific date being assigned to their first grant date from "time immemorial," and not from the date of the visitation itself. Even supposing that we cannot establish the greater antiquity of the authorised arms, the advantage claimed in this respect for the conventional arms is rather damaging than otherwise to their pretensions, as the arms allowed in 1623 were authorised in the face of rivals whose very existence was an assertion of their claims, which, however, were set aside.

(2) The argument of usage and prescription in favour of the conventional coat of arms is of little value, seeing that their authority was never officially sanctioned; and there is no evading the axiom laid down in a standard book of heraldry that in "granting, conferring, or recording arms, the sole right rests with the College of Arms." ("Heraldry, Ancient and Modern," by S. T. Aveling.) The continuity of the alleged usage and prescription was broken in 1862, in a way which it is useless to ignore or minimise, as the subject was then thoroughly threshed out, and the only authorised arms were ordered to be placed on the mayor's staves. At that time Mr. Planché referred for confirmation of his views to the correct arms set up by Bishop Montague in the ceiling of the abbey previous to his translation to Winchester in 1616. These arms in the abbey are a stubborn fact which cannot be argued away by assuming "the stupidity or caprice of the artist," who, be it remembered, was Chancellor to the Garter.

(3) It is said that the conventional arms are more appropriate and significant than the authorised ones. The interpretation now offered of the spurious arms would certainly never be conjectured by the ordinary mind, as it is not at first sight evident how "bars wavy" streaming in mid-air can represent water rising within the walls, the "bars wavy" in question not being figured in the shape of columns rising from the ground, but as bands running horizontally and high above the battlements; but in the authorised coat of arms it is not difficult to understand water flowing through arches in the wall and waving at their base.

That the conventional arms are historically interesting is undoubted, but it is no part of my present purpose to account for them. I merely throw out by the way a query, offering a fruitful field of inquiry, whether they were not in the first place a trade or guild badge—in which case the "bars wavy" or "streamers" would suggest a ready interpretation; nor is it difficult to conceive how the freemen's badge might gradually usurp, without authority, the place of the civic arms.

(4) The last point brought forward in support of the unauthorised arms is their superior artistic merit. There is no arguing about tastes, and there is little necessity for me to do so, for it must be evident that the question does not enter into the case, as the authority of historical truth can never be established, even partially, by such considerations; and the matter of artistic merit has been obviously and gratuitously imported to enable a hostile critic to let off his spleen and attack me on a point not under discussion.

In 1862 the Somerset Herald was appealed to, and his decision was accepted by those who made the appeal. Twenty-six years have passed, and an official holding the same position has given the same opinion. Such a matter as this should not be left to be argued again; and the only way to set the subject at rest for ever would be to petition the College of Arms to make a new coat of arms, or to confirm under their seal the "historically true and ancient coat." I am aware that there is a sort of vested interest in the spurious arms, printers, publishers, and citizens generally having gone to considerable expense in a variety of ways to employ them on their circulars and advertisements. I have therefore to contend not only with those who are disinterestedly wedded to what they believe to be the ancient arms, but with those who find heraldry a convenient stalking-horse from behind which they can discharge their arrows, as well as with those whose property may be depreciated by the decision of the Council. Personally I have no interest in the matter beyond an earnest desire to maintain the ancient coat of arms against that which is spurious and destitute of any semblance of authority.

#### SCHOOL BUILDING IN LEEDS.

AT last week's meeting of the Leeds School Board Mr. Fawcett submitted the report of the Sites and Buildings Committee, recommending (1) the acceptance of tenders for painting and cleaning schools during the ensuing summer vacation, at a cost of 1,132*l.* 12*s.* 6*d.*; (2) the acceptance of tenders for the enlarging of Bewerley Street School, amounting to 2,991*l.* 5*s.*; and (3) the appointment of Messrs. Kelly & Birchall as architects for the Bramley School extension.—In answer to Mr. Bowling, Mr. Yates stated that the plans for the Bewerley School Street extension were prepared by Mr. Landless, the clerk of the works at the Central Higher Grade School, and the instruction was recorded in the minutes. It was quite understood when Mr. Landless was appointed clerk

of the works at the Higher Grade School, that he should render to the Board any service in his power at any time without extra remuneration. Accommodation would be provided for 360 children.—Mr. Bowling said he understood that the architect who prepared the original plans for the school was Mr. Corson, and he was surprised that anybody else should have been engaged to carry out the extension. It seemed desirable that Mr. Corson should have been allowed to undertake the enlargement, if only to preserve the architectural features of the building.—Mr. Stead thought it rather peculiar that a gentleman belonging to the party who posed as the only economists of the Board should make it the burden of his complaint that they had not needlessly thrown away 60*l.* or 100*l.* It was clearly to the interest of the Board that Mr. Landless's services should be at their disposal. During last winter the work at the Higher Grade School was stopped, and if Mr. Landless had not had the Bewerley Street School in hand he would probably have had nothing to do.—Mr. Pebody said that in the case of Mr. Landless their economy consisted in having appointed him as clerk of the works at five guineas a week, when they could have got equally competent men at a smaller sum.—Mr. Fawcett reiterated his statement that Mr. Landless had received no extra remuneration for the work.—Mr. Cockburn said that the saving which Mr. Stead had mentioned was the only offence of which their side of the Board had been guilty. He would like the public to see what a shrewd, economical member they had in Mr. Bowling.—The report was adopted.

#### ARCHÆOLOGY IN SURREY.

FOR the annual excursion of the Surrey Archæological Society, the country about Ockley and Oakwood was selected. The district is interesting, but unfortunately the weather was not favourable, and the attendance was in consequence less numerous than on former occasions. The excursion was directed by Major Heales.

At Ockley Church, Mr. Ralph Nevill, F.S.A., read a paper descriptive of the building. He said there was no mention of a church in Domesday, and indeed the mention of Ockley at all was obscure. The rector had given him a reference unearthed by Mr. O'Flahertie, of Capel, in the registers of Winchester of the date 1336, which granted a dedication of the church, and which church was stated to be "formerly founded, destroyed, and new and totally rebuilt, as we understand, from the foundations." It was evident that the church was rebuilt in time for re-dedication in 1336. Of this date was doubtless the good window on the south side—really almost the only piece of antiquity in the church. During the restoration, everything possible was saved by the care of the rector. The chancel had a brick east wall, and the porch was apparently of the sixteenth century. The tower was rather a puzzle. The tradition was that it was built to fit the bells about 1700, but it was not clear whether the four arches inside were of the same date. On the whole, he was inclined to think the arches were those of the original central tower of the church mentioned as destroyed in 1336, at which period the central tower was left at the west end. The registers are unusually early, there being a fine one of 1539, before the passing of the Act for keeping registers. Aubrey mentioned an interesting custom connected with the churchyard. "In the churchyard," he said, "are many red rose trees planted among the graves, which have been there beyond man's memory. The sweetheart, male or female, plants roses at the head of the grave of the lover deceased." Manning suggested that the custom was derived from the Romans, "who were much about here." This part of Surrey was the seat of many old families, of whom Mr. Lee Steere, of Jeyes Park, formerly M.P. for West Surrey, was perhaps the principal representative.

Major Heales, in moving a vote of thanks to Mr. Ralph Nevill, said that whilst one deprecated very much that in the restoration of ancient buildings the appearances of antiquity were spoiled, yet one could not help feeling that the house of God should receive care and decoration to make it as far as practicable worthy of Him for whom it was intended.

The adjoining Ockley Court Farm (now occupied by Colonel Calvert) was next visited. Mr. Ralph Nevill again read a paper dealing more particularly with the battle of Ockley between the Danes and Saxons. He observed that they were now upon very old ground. The ancient Stane Street, which they would see that day, still remained one of the best preserved examples in England of a Roman road. It ran in nearly a straight line direct from Colchester, the ancient Regnum, across the downs, by Bognor, with its celebrated Roman villa, by Pulborough, then hence on to Dorking. He went on to state that Dorking had been, with great plausibility, identified by Mr. Puttock with the Roman town of Dolocindum. In giving a chronological sketch of the events that seemed to have affected Surrey in the Saxon period, Mr. Nevill observed that in 805 there was a great council at "Aclea" (Ockley), attended



by Cenwulf, King of Mercia, Cuthred, the sub-king of Kent, twelve bishops, four abbots, ten "duces" (or dukes), and others. This was followed in 824 by the holding of another council, and a third in 844. At first sight it seemed strange that so out of the way a place as Ockley should be selected for such a gathering; but he pointed out that in those days it was convenient, as being on the borders of the recently-conquered kingdom of Kent, and that it was also convenient for the overlords first of Mercia and then of Wessex. Aubrey gave the site of the ancient castle, said to have been destroyed by the Danes, as near the church, and Mr. Nevill remarked that the formation of the ground around which they were now assembled bore undeniable traces of this fact. As to the site of the castle, Aubrey defined it as near the church. Bray seemed to have identified it with another site, a mile or more away, but he (Mr. Nevill) did not think that that could be accepted. The rector had told him that the tradition had it that it was on the site of the present farm buildings adjoining. One could trace the moat by the ponds and what seemed to have been a ditch, and on two sides the streams formed the natural moat. On the west side beyond the moat formed by the stream a high bank or vallum still remained, with an artificial second moat beyond it. Of course, a castle of those days was merely a mound of earth and a stockade. In building a wall there a few years ago the workmen came across a quantity of pottery, the fragments of which were preserved, including a fine and interesting vessel of the Saxon date. If the contemplated removal of the Society's museum to Guildford was carried out, he hoped there would be an extra incentive to the preservation of all such interesting memorials. Mr. Nevill alluded to the interesting remains of ancient moated enclosures around that very neighbourhood, dealing more especially with Thundersfield, which the late Mr. Godwin-Austen thought might be one of the enclosures in the woods that Cæsar described as held by the ancient Britons at the time of his invasion, and they certainly answered that description. From its peculiar position in a detached portion of the parish of Ockley, and the curious arrangement by which there were parts of seven parishes contiguous, Mr. Nevill thought it likely that the large camp on Holmbury Hill was the headquarters of Mercian power during their long supremacy in this part, and that the smaller camp on Anstiebury may have been thrown up by the Danes, and not, as sometimes thought, by the Romans. There was, however, no doubt a Roman camp on Bury Hill, Dorking, as was shown by the survival of the name "The Nower" adjoining it. Mr. Nevill next proceeded to give some particulars of the famous battle of Ockley. In 851, he said, occurred the first great Danish invasion. The Danes sailed with 350 ships into the mouth of the Thames, and burnt and plundered Canterbury, the ecclesiastical centre of England, and London, the wealthiest town. They defeated the forces of Mercia, and then marched into Surrey, doubtless on their road to Winchester and Chichester. From foreign historians, as quoted from Lappenberg, they learnt the host was part of that of "Rörik," nephew of Harold Klak, the remainder of whose host was employed in pillaging Holland. It was at Ockley that the course of the plunderers was stopped by Ethelwulf, and a fierce fight ensued. The words of the chronicle were:—"Ethelwulf and his son, Ethelbald, with the army of the West Saxons, fought against them at Ockley, and there made the greatest slaughter among the heathen army that we have heard tell of unto the present day, and there got the victory." A place called Slaughterbridge, near the Sussex boundary, has been thought to owe its name to the battle, and Mr. Nevill had found the name "Sloghterford" in a fourteenth-century deed. Wolven Lane, Wolvers, and Wolve's Hill also, doubtless, commemorate the victorious Ethelwulf. It was well that Surrey men should remember that on that spot their ancestors helped to inflict on the proud conquerors of Canterbury and London the crushing defeat that so impressed contemporary writers, and that perhaps helped to inspire the heroic deeds of Ethelwulf's son, Alfred. Who knew but that history might not repeat itself? They had heard much of late years of the battle of Dorking and of other invasions. Let them hope that the sack of London might not be repeated; but it might yet be that again in that spot the invader of England might learn to rue the day he crossed the narrow seas.

At Oakwood the hon. secretary, Dr. Milbourn, read a paper giving some very interesting information regarding the ancient chapel. In the course of his remarks he stated that very little had been found out regarding the early history of the building. It was established as a chapel-of-ease, apparently for the parishes of Abinger, Wotton, Ockley, Ewhurst, and two parishes in Sussex. Salmon attributed its foundation to Edward de la Hale, a knight of the district, who was supposed to have founded Hale House. But the building evidently dated from 1210 or 1220; and as Edward de la Hale undoubtedly died in 1430, it was clearly evident that he could not have been the original founder of the chapel. Some years back three of the bells were taken away in order to restore the building, and Mr. Evelyn, of Wotton, contributed largely towards the expense.

The Rev. Mr. Chichester produced several interesting documents, one of which was a petition drawn up and presented in the reign of Edward VI., praying for a continuance of the service at Oakwood. The Rev. Mr. Knowles (the vicar) also exhibited several interesting tracings of wall-paintings discovered during the restoration of the chapel some years ago.

The final visit of the excursion was to Capel Church.

## ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS.

THE annual meeting of this Association was concluded last week at the Institution of Civil Engineers, Westminster. Mr. E. B. Ellice-Clarke again presided. Lieutenant-Colonel Jones read a paper giving ten years' experience of what is known as the "Shone" ejector, for the lifting and propulsion of liquid or semi-liquid matter by compressed air, automatically admitted and discharged, or blown off by a machine called a pneumatic ejector. Examples were given, including instances at Eastbourne, Henley-on-Thames, and Fenton, Staffordshire, where the system was working satisfactorily. In the course of a long discussion on the paper, the opinion was generally expressed that the "Shone" injector for ordinary purposes of pumping was not equal to existing methods, on the score of either efficiency or economy. It was admitted, however, that it is useful under some exceptional circumstances, though it was strongly urged that no reliable data had been given of the actual cost of working the "Shone" system in any of the places named. Mr. de Courcey Meade, of Hornsey, read a paper describing the electrical fire-alarm arrangements adopted in that district, which he commended as highly efficient; and Mr. William Webster, F.C.S., read a paper describing the decomposition and purification of sewage by means of electricity. He passed a strong current of electricity through sewage before the meeting, and the solid matter speedily rose to the surface, leaving the fluid apparently bright. He also exhibited a sample of effluent water eight months old, and also a specimen of a disinfecting fluid obtained from sewage twelve months ago. The chief expense, he stated, was the engine power, and the process could be applied to any existing tanks. The thanks of the Association were voted to Mr. Webster for bringing before it so important a matter before he had made known his process in any other way. Several speakers considered the process likely to be productive of great results, provided it could be economically applied to the treatment of large quantities of sewage, as the analyses submitted showed the effluent water to be absolutely free from suspended matter. The members, at the close of the discussions, proceeded to visit various engineering works of interest in the metropolis.

## TESSERÆ.

The Equestrian Statue of Marcus Aurelius.

EMIL BRAUN.

MICHEL ANGELO was wont to say of this unique work of art that the horse had only to plant the raised hoof upon the ground to complete the illusion that it was a living creature. Distinguished artists have earnestly striven to emulate this unpretending, but comprehensive and fully developed, representation of historical reality, and have ended by being convinced of the impracticable nature of their undertaking. It is not enough that striking faults are avoided, nor even that the laws of beauty are observed with refinement; above all, it is important that the artistic thought should be adopted by the passive material destined to give it expression in such a manner that the two should never be at variance with each other. The decided superiority maintained by this representation of the victorious and merciful Emperor over all statues of a similar kind is mainly attributable to the simple chronicle style selected by the artist. We find no attempt made to deify his hero, but rather the resolute determination to divest him of all such properties as lend only a transitory splendour, and which therefore cannot be recognised by history. The horse appears to be the very same which, after having carried its master over the field of battle, is now, with proud and measured pace, bearing him past the captives, who have sunk down on their knees, and look up to him imploring mercy. Every motion of the noble animal has a meaning. The spirit of the master appears to have passed into the steed. The spectator feels that only the occasion is wanting to bring the strength latent in the heavy frame into instantaneous development. Marcus Aurelius, one of the noblest disciples of the Stoa, displays a sublime self-command which disposes him the more to feel sympathy with others. He raises his right hand mildly, and gives the signal of pardon to the conquered.



We feel that the beautiful quality of mercy reacts upon him who exercises it. In comparing the artistic beauties of the horse with those of the rider, the latter is so far inferior as to have given room for the opinion that they were the production of two different artists. This idea seems, however, unfounded, although it is supported by the fact that the figure has been adapted to the horse, and might easily, even now, be exchanged for another, as it admits of having been removed without leaving a single material trace of the alteration. The Emperor wears the plain mantle of a warrior. He carries no weapon nor any other token of his rank. The likeness appears to have been striking, each separate feature—nay every accidental gesture—bearing the stamp of individuality. Even his manner of sitting the horse is so characteristic that beauty has been boldly made subservient to a strict adherence to truth. For it is not to be denied that, when viewed in front, the feet of the rider are placed so far apart as to offend the eye. On the other hand, equestrians maintain that, in the absence of saddle and bridle, this manner of sitting the horse is perfectly natural. The artist has taken the liberty of placing the raised feet of the horse diagonally, which produces a good effect with regard to the stylistic arrangement of the masses, but is contrary to the truth, nay even to the laws of nature. A living horse moving in this manner would tear the antagonistic muscles, as has been proved by mechanical experiments.

#### Architecture under Francis I.

E. L'ANSON.

Although in the buildings of the time of Francis I. there is a very evident reference to the revived schools of Classical architecture, still there is no servile copy; indeed, there is no part of the decoration in particular which does not, more or less, bear a very distinct and separate character from its type. The proportions of all the mouldings of the cornices and string-courses at Blois, Fontainebleau, and Chambord are very much exaggerated, as in Prout's drawings; they are all coarse, and but rude copies of the best Italian work. There is, however, a great vigour gained by this treatment, and the peculiar cornices of Chambord and Blois, although not to be compared in elegance with Italian work of the same time, yet have a rude and massive character which gives very considerable dignity to the whole work. The projection of the pilasters is small, the arch mouldings and architrave mouldings are generally delicate and of better profile than the main cornices and string-courses, and the decoration of the capitals and carved panels is of a character often of extreme delicacy, and always of great and peculiar beauty, and there is an exuberant fancy in their varied design. The representation of foliage is perfect, and the best adapted for architectural decoration of any school of art. Ciphers and emblems, figures and animals, are sometimes introduced, but the animal carving does not equal the flowing racy vegetable form of the foliage, and at Chambord it is certainly very inferior. The buildings of this age are very much ornamented with the emblems and ciphers of their owners, a practice indeed, which, as to the ciphers, has been continued in France to our day to an extent much beyond what prevails amongst us. The F for Francis, surrounded by the Cord of Anne of Brittany, and the Salamander his emblem, and sometimes his motto "Nutrisco et Extinguo," are common on all the works of his period, whether they are Renaissance as at Blois, or Flamboyant as in the transepts at Beauvais. H for Henry, and his emblem the Crescent, also the emblem of his mistress, which he did not scruple constantly to use on the buildings of his reign. At Chambord, indeed, no opportunity seems to have been lost of displaying the royal H and the Crescent interlaced; also the two U-J connected forming H and D; and at Fontainebleau they are even used in the chapel. The Porcupine was the emblem of the ancient house of Orleans; the Ermine of the house of Brittany; une Cordelière, of Queen Anne of Brittany; and the S with a Dart through it was the emblem used for the name of the mistress of Henry IV., Gabriel d'Estrees.

#### Architectural Drawing.

SIR G. SCOTT.

The making of good pictures of our designs or buildings is no part of the fine art of architecture. It is, in fact, an art almost peculiar to our own day; but though highly conducive to the success of the individual architect, and, when well directed, a great aid to the study of architecture, it is hardly to be viewed as a very direct means of producing good architecture. To make good pictures of bad designs is obviously injurious, and renders disappointment the more certain and the more bitter; while to make good pictures of good designs may have been the beneficial effect of promoting their adoption, but still cannot be in any degree considered as of much importance to the actual result; for a well-studied design in artistic hands will be just as good when executed, if no picture at all had ever been made of it; and an ill-studied design no better for the finest drawing having been made to recommend it. This, then, it is clear, is but a secondary art—an elegant accomplishment

which becomes both useful and elevating when added to practically artistic powers—but worse than useless in their absence. Here I am happy to find Professor Cockerell's view to be as one with my own. After urging perspective drawing as essential to facility of designing, and also the necessity of cultivating the powers of the imagination, he adds:—"Having thus put before you an outline of those advantages which are to be derived from our association with the sister arts, let us be guarded against their dangerous deductions. I look upon it that all their advantages are purely linear, and not aerial or polychromatic. . . . This great error of the English school of architecture may be said to have arisen from the juxtaposition of architectural drawings in our exhibitions, to the works of the painter. . . . Colour, chiaro-oscuro, and aerial perspective are of no sort of importance (*i.e.* in architectural representations): and how entirely my opinion is supported by the best authorities and the best practice has often been laid before you. In one year in particular, I was enabled by the kindness of friends to lay before you some architectural drawings of Raphael, Michel Angelo, Sansovino, and Inigo Jones, in all of which proportion, composition, profile, and orthographic delineation were the sole end and object of their drawings, and no tricky effects of light or shade or colour were for a moment thought of or permitted. Philibert de l'Orme has humorously said, speaking of pretty drawings, 'They are hits to catch a customer, but are insufficient evidence of the substantial knowledge of the art. Be quite sure,' says he, 'that those who amuse themselves in making pretty drawings only, are those who least understand the real art and science of architecture. I do not deny,' continues he, 'that it is a graceful accomplishment in the architect to portray and paint, but his true business is with the model, and with lines only expressive of his design, its proportions, and measures.'" The power of ready and skilful sketching from actual architectural objects comes much nearer to the fine art of architecture. It is not that fine art itself, but it is one of the most direct means of attaining it. I therefore class this much higher. It must not be mistaken for the practical result aimed at; but, as a general rule, I should say that it is so necessary to it as to be its closest ally and precursor, and therefore to be cultivated with all possible diligence; but I would urge the keeping of the ultimate object always in view, viz., that sketching should be mainly followed up with the direct intention of self-culture; that the architect or student should aim in a less degree at storing his sketch-books with pleasing representations, and laying in a stock of precedents for future reference, than at the direct training of his mind and eye and hand to the conception and designing for himself of works similar in kind to those he is studying; and the kind of drawing which he should mainly aim at cultivating is that which will be the fittest means of conveying his artistic conceptions more clearly to the art-workman who will have to carry them into execution, the result being everything, the means comparatively nothing, in importance.

#### The Temple of Apollo at Delphi.

K. G. FIEDLER.

The temple of Apollo, even when we calculate value as of the present time, was enormously rich. King Croesus presented 117 blocks of gold, in thickness the breadth of a hand, six times as long and thrice as broad, each of which weighed two talents; a golden lion of ten talents; a large golden tripod, upon which the Pythia sat, with the golden statue of Apollo. Beyond this there was a cup of gold, eight talents in weight; one of silver, containing 600 amphoræ, in which the wine was mixed at the feast of the Theophania, &c. &c. In spite of the various plunderings, in the time of Pliny more than 3,000 statues remained. Strabo first describes it as poor. Pausanias saw 137 statues, works of art, and rich treasure-chambers; the latter were subterranean, round, like those of Atreus at Mycenæ; the best were those of the Sicyonians, Corinthians, and Siphnians, of whose gold mines Apollo had a tenth; those also of the Thebans and Athenians. All now is robbed, destroyed—it has disappeared, and on the holy territory of Apollo is a small poor village of frail tenements.

#### The Greek Orders.

S. SMIRKE.

Let no student suppose, in whatever amount of conscious strength he may indulge, that he can with safety trust himself to the trackless wastes of his own imagination, and shut his eyes to the lights that have been set up by long experience, or to the landmarks which the past has left for the guidance of the future. It is a false and vulgar opinion that rules are the fetters of genius. "He who begins by presuming on his own sense," says Sir Joshua, "has ended his studies as soon as he has commenced them." Now, the orders of architecture are instances of such rules of art, and have been instituted, not as fetters to embarrass, but rather as helps to strengthen, the judgment. It is no uncommon thing to hear these orders spoken of with disparagement, as tending to inculcate a servile



adherence to arbitrary rules, destructive of originality and of inventive talent. I think that this impression is founded on a misapprehension of the nature of these orders; a misapprehension, I am ready to admit, likely enough to arise from the dogmatical tone in which the proportions of the five orders are often laid down. The truth is, that the artists of ancient Greece in its best days, endowed with an unmatched perception of beauty and of the most refined cultivation, were led by their observations and experience to adopt certain general forms and proportions; and students struck with their beauty, have sought to trace it back to its original sources by an analysis of those forms and proportions; that is by their exact measurement and delineation—a very legitimate, natural and indeed necessary process. In thus deducing a system of proportions from the practice of the best architects, we are surely acting as reasonably as the student who would deduce rules of poetical composition from the poetry of Milton or of Pope. It is thus that the orders of architecture have been instituted; but it is an error to regard them as composing an infallible standard of taste, from which any deviation must be heresy. With a praiseworthy adherence to truth, the travellers who have measured and delineated these works, in giving us their transcripts of ancient examples have figured for our information minute fractions—any hair's-breadth—and thankful we should be for their laborious exactness; but it would be a gross mistake to represent that to these fractions we are to pay a superstitious reverence: this was far from the practice or intentions of the great authorities themselves. Vitruvius tells us of the diversity of practice that prevailed even in his own times. In truth, many wide diversities exist among the best examples. In the relation of the diameter to the length of the shaft of the Greek Doric order there is a difference of 33 per cent. between the heaviest and lightest examples, even in the best times. In the Ionic order a similar, though perhaps not so great, diversity prevails; and every tyro is aware also of the extreme variety in the form and character of the details existing between even pure examples of these two orders. Similar comparisons might easily be multiplied, abundantly sufficient to show that the best masters of classic times held the reins with a loose hand; indeed, under the easy sway of these five orders we recognise a regimen so mild as to satisfy any reasonable love of liberty. The value of these great examples has been not unfrequently tested and proved by the fantastic variations which have been sometimes boldly grafted upon them. In these attempts at new or amended orders we find little to encourage any wide departure from the parent forms; but, on the contrary, we recognise in them more clearly the convenience and wisdom of adhering pretty closely to known standards, which the eye has learnt to appreciate as accurately as the cultivated ear distinguishes the intervals of scientific harmony. To set at naught the architectural forms which the age of Pericles has bequeathed to us is about as idle and undiscerning a task as to condemn the rules of counterpoint, or the musical scale which has descended to us from Guido of Arezzo.

#### Oblique Mortise and Tenon.

J. ROBISON.

The joint that most of all demands the careful attention of the artist is that which connects the ends of beams, one of which pushes the other very obliquely, putting it into a state of extension. The most familiar instance of this is the foot of a rafter pressing on the tie-beam, and thereby *drawing* it away from the wall. When the direction is very oblique (in which case the extending strain is the greatest), it is difficult to give the foot of the rafter such a hold of the tie-beam as to bring many of its fibres into the proper action. There would be little difficulty if we could allow the end of the tie-beam to project to a small distance beyond the foot of the rafter; but, indeed, the dimensions which are given to tie-beams for other reasons are always sufficient to give enough of abutment when judiciously employed. Unfortunately this joint is much exposed to failure by the effects of the weather. It is much exposed, and frequently perishes by rot, or becomes so soft and friable that a very small force is sufficient either for pulling the filaments out of the tie-beam or for crushing them together. We are, therefore, obliged to secure it with particular attention, and to avail ourselves of every circumstance of construction. One is naturally disposed to give the rafter a deep hold by a long tenon; but it has been frequently observed in old roofs that such tenons break off. Frequently they are observed to tear up the wood that is above them, and push their way through the end of the tie-beam. This, in all probability, arises from the first sagging of the roof by the compression of the rafters and of the head of the king-post. The head of the rafter descends; the angle with the tie-beam is diminished by the rafter revolving round its stop in the tie-beam. By this motion the heel or inner angle of the rafter becomes a fulcrum and a very long and powerful lever, much loaded. The tenon is the other arm, very short, and being still fresh, it is therefore very powerful. It therefore forces up the wood that is above it, tearing it out

from between the cheeks of the mortise, and then pushes it along. Carpenters have therefore given up long tenons, and give to the toe of the tenon a shape which abuts firmly, in the direction of the thrust, on the solid bottom of the mortise, which is well supported on the under side by the wall-plate. This form has the further advantage of having no tendency to tear up the end of the mortise.

#### Imitative and Conventional Ornament.

J. FERGUSON.

In certain styles of art vegetable forms are employed. Among these perhaps the most beautiful and perfect ever invented was that known as the honeysuckle ornament, which the Greeks borrowed from the Assyrians, but made so peculiarly their own. It has all the conventional character of a purely lithic, with all the grace of a vegetable form, and as used with the Ionic order, is more nearly perfect than any other known. The Romans made a step further towards a more direct imitation of nature in their employment of the acanthus leaf. As applied to a capital, or where the constructive form of the bell beneath it is still distinctly seen, it is unobjectionable; but when the leaf supports the volute at the angles of the abacus, it is on the very verge of good taste. With their disregard of precedent and untrammelled wildness of imagination, the Gothic architects tried every form of vegetable ornament, from the purest conventionalism, where the vegetable form can hardly be recognised, to the most literal imitation of nature. By employing the former an architect can never sin against good taste, though he may miss many beauties; with the latter class of ornament he is always in danger of offence, and few have ever employed it without falling into mistakes. In the first place, because it is impossible to imitate perfectly foliage and flowers in stone; and secondly, because if the pliant forms of plants are made to support, or do the work of, hard stone, the incongruity is immediately apparent, and the more perfect the imitation the greater the mistake. In too many instances, even in the best Gothic architecture, the construction is so overlaid by imitative vegetable forms as to be concealed, and the work is apparently done by leaves or twigs, but in the earliest and purest style this is almost never the case. As a general rule it may be asserted that the best lithic ornaments are those which approach nearest to the grace and pliancy of plants, and that the best vegetable forms are those which most resemble the regularity and symmetry of those which are purely conventional.

#### Cast-iron Beams.

T. DAVIES.

Mr. Hodgkinson, in a paper in the "Memoirs" of the Manchester Philosophical Society, gives as the results of his experiments, that the under flange should be to the upper in the proportion of 6 : 1. His experiments having been extensive and carefully made, have ever since been considered the standard of reference, and I do not suppose that his conclusion on this subject has ever been called in question. However, having been led to examine his experiments for the purpose of condensing the results into a general law, or into a few statements that might be carried on the memory, I began to suspect that there was something wrong in the conclusion he had come to. At first I could scarcely bring myself to think that this could be the case after Mr. Hodgkinson's paper had been so long before the public, and after a considerable portion of it had been incorporated into two of the best works we have on the subject—"Barlow on the Strength of Materials" and "Fairbairn on Cast and Wrought-iron," by the authors of which the opinions contained in it have thereby been homologated. I have looked, however, over the subject again and again, to see if by any possibility there might be lurking a fallacy in my reasoning, but I can see none. The conclusion, then, on this particular point to which I have come, drawn from Mr. Hodgkinson's own experiments is, that the strongest section of beam is that with flanges from  $3\frac{1}{2} : 1$  to  $4 : 1$ , instead of  $6 : 1$ , as stated by Mr. Hodgkinson. I may indicate the nature of the oversight which, I consider, has been made by Mr. Hodgkinson. He gives the result of nine experiments on beams, with double flanges of different proportions, from which he comes to the conclusion already stated. In comparing things together, as, for instance, in the present case, the comparison of the amount of strength due to the different proportions of upper and under flanges, it is necessary to have all other things equal, or that allowance be made for any difference, and Mr. Hodgkinson has, accordingly, had these beams made of equal length and depth. He has, however, in his comparison left out of consideration the difference in the thickness of the webs.

A Papyrus of the fourteenth century before our era has been added to the British Museum. It contains certain chapters of the "Book of Death," carefully copied out by a scribe of Thebes. The illustrations are vivid.



## NOTES AND COMMENTS.

THE admiration for the works of MILLET the painter is not confined to France, and it may be said that engravings from his works are in greater demand than those from MEISSONIER'S pictures. Many strangers, and especially Americans, make it a duty to go on a pilgrimage to Barbizon, in order to see the simple house which the painter inhabited, and to contemplate the district which inspired him. An effort was lately made to preserve the house as a public building, allowing Madame MILLET to occupy it during her life. A sum of 20,000 francs was offered, which any valuer would say was a high price for the house. But the owner wants 35,000 francs, which is considered an unreasonable demand by the committee. Unless the owner becomes reasonable the house will not be purchased and is therefore likely to be demolished.

THERE was close voting in the Council Chamber of Tamworth over the proposition for the purchase of a site and the erection of municipal buildings. It was, however, carried by the casting vote of the chairman. The townspeople lately protested against the scheme, and the voting expresses the division which exists in the town. It is not surprising that some grumblers are to be found, for at present the rates are said to amount to about 6s. 8d. in the pound. If by any mismanagement an unsatisfactory design should be adopted, it will go hard with the councillors who voted in favour of the new buildings, and it therefore behoves them to take care that a safe way is adopted to insure drawings which will overcome the opposition.

A FEW French artists have been fortunate in obtaining a share in the honours which the French President awarded on the occasion of the National Fête. M. AUBÉ, the sculptor, and M. BOILEAU, the architect of the Gambetta Monument, obtained the ribbon of Chevalier of the Legion of Honour from the hand of M. CARNOT. The honour does not, however, induce all Parisians to admire their work, which is somewhat of a disappointment. Another architect, M. LALOUX, is also a chevalier. The sculptors who can henceforth wear the ribbon are MM. CORDONNIER, TURCAN, and FRANÇOIS. M. CHAPLAIN is raised to the grade of officer. Only one painter was recognised this time, viz. M. DELORT. The professors of literature obtained the lion's share of the ribbons.

AFTER all the decisions against them in respect to the tax for aiding the poor, the French artists may not have to part with any of the money received at the doors of the Salon for admission to the exhibition. The Assistance Publique Department claimed 103,000 francs, or about five-eighths of the total profit out of the exhibition, which was 160,000 francs. The expenses for the two months were 240,000 francs. The Judgment of the Council of the Prefecture now is that, the Salon exhibition being a sort of public enterprise and a national work, and as the profits do not enrich any individual speculator or company, but are bestowed on artists who are necessitous, the exhibition cannot be classed with a theatre or other place of amusement out of which owners derive profit. The Société des Artistes Français will accordingly be still considered as exempt from contributing to the funds of the public assistance unless a different decision can be obtained from another tribunal.

It is commonly known that in trees, especially exogenous, the trunk consists of a series of concentric circles, each one representing a year's growth. In all cases the circles are not readily identified. The rate of growth is not uniform, for in the early years the circles are wider, but after a time there is more regularity. It was recommended by DECANDOLLE that observations about the rate of growth should be recorded, and, if a sufficient number existed, there would be no difficulty in assuming the age of a tree from a measurement of its circumference. It would be an average of several observations. But, as a rule, measurements of the kind are not preserved, and the more importance is therefore to be attached to those which were

presented before the last meeting of the Botanic Society of Edinburgh by Dr. DAVID CHRISTISON. He kept a record of the increase of girth of the trees in the Botanic Gardens at Craigiehall from 1878 to 1888. In the case of the beeches, of which species ten specimens had been measured, the measurement of one tree, when first noted, had been 71.40 inches, while in 1887 its girth had increased to 81.75 inches, showing a total increase of 10.35 inches, and an average annual increase of 1.03 inch. In another instance the girth when first measured had been 97.30 inches, increasing in ten years to 100.40 inches—a total increase of 3.10 inches, and an average increase of 0.36 inch. Many more results were shown in tabular form. It was remarked that two disturbing elements had to be taken into account. The first was that some of the trees which had been selected for measurement had proved of too great age for the purpose in view; and the second, that during the period dealt with the winters for three successive years had been exceptionally severe. These circumstances had complicated a subject which otherwise would have been simple enough.

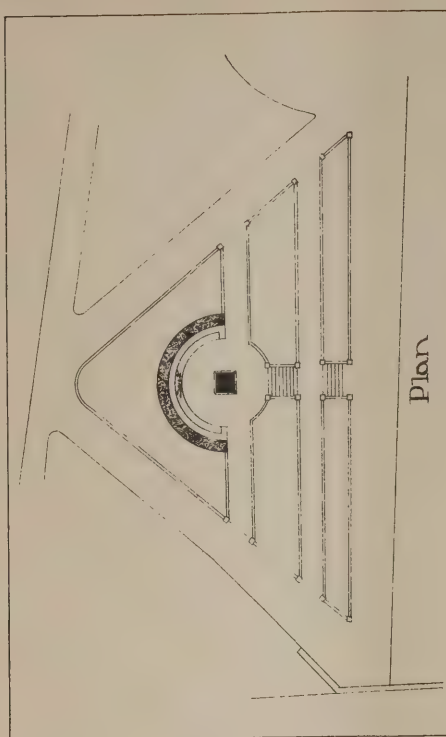
AT the excursion of the Shropshire Archæological Society the Rev. C. H. DRINKWATER (who was at one time an architect) described a curious inscription which was found on taking down wainscot in Llanfair Waterdine Chapel, near Clun. The inscription was on a panel measuring 34 inches by 3 inches, and was in two lines, consisting of characters that apparently are of an unique form. There are in all nearly seventy of them, containing nineteen distinct letters. Two of them have been thought to resemble the word Maria, in Greek letters. If this conjecture is correct the character for M occurs twice, that for A five times, that for R five times, and that for I seven or eight times, which would be about the proportion in any ordinary inscription for such letters. It has been thought that they are musical notes or neumes, but they do not agree with the musical notation of the eleventh century, which is probably about the date of the carving. Of other letters, P occurs twice and O three times. A more satisfactory conjecture is that they are the very rough copy, made by an illiterate workman, of bad writing, the strokes of each letter being taken separately, at an unusual distance from each other; but even then they cannot be made out, and whether they are Saxon, Welsh, or Latin cannot now be determined. The introductory character is something like what printers call an index. This is common enough in an Irish treatise usually known as the "Book of Ballymote," a vellum MS. preserved in the library of the Royal Irish Academy, Dublin. This was compiled between 1370 and 1390. It is written in ancient Irish, and several characters in it correspond to the letters of this inscription, if inscription it be.

THE meeting of the subscribers to the British School at Athens, and the Cyprus Exploration Fund, was held on Wednesday. A report was read about the progress of the work in Cyprus. Permission was first obtained to dig on a hill known as Leonfari Vouno, near Nikosia, and afterwards at the village of Kouklia, the site of the ancient Paphos. This occupied a fortnight, and led to the discovery of primitive walls and many objects belonging to an early period. At Kouklia, the famous temple of APHRODITE was completely cleared, and the ground plan carefully made out; numerous inscriptions of considerable interest were discovered, and also a few fragments of good sculpture and a large number of miscellaneous objects in pottery, glass, &c. A third excavation was carried on at Amargetti, which was successful in identifying the site of an ancient village probably called Melantha, where APOLLO was worshipped under the title OPAON. The report from Athens stated that the school had in its second session amply fulfilled the hopes of its supporters. The supply of students seemed likely to be constant; the usefulness of the school, not only to classical scholars and archæologists, but also to the artist and the architect, was becoming more widely recognised. The financial statement was not so satisfactory, for, in spite of appeals, the additional donations during last year amounted to only 110%, and the subscriptions were only increased to the extent of 7%. Further help must be insured if the operations are to be continued.

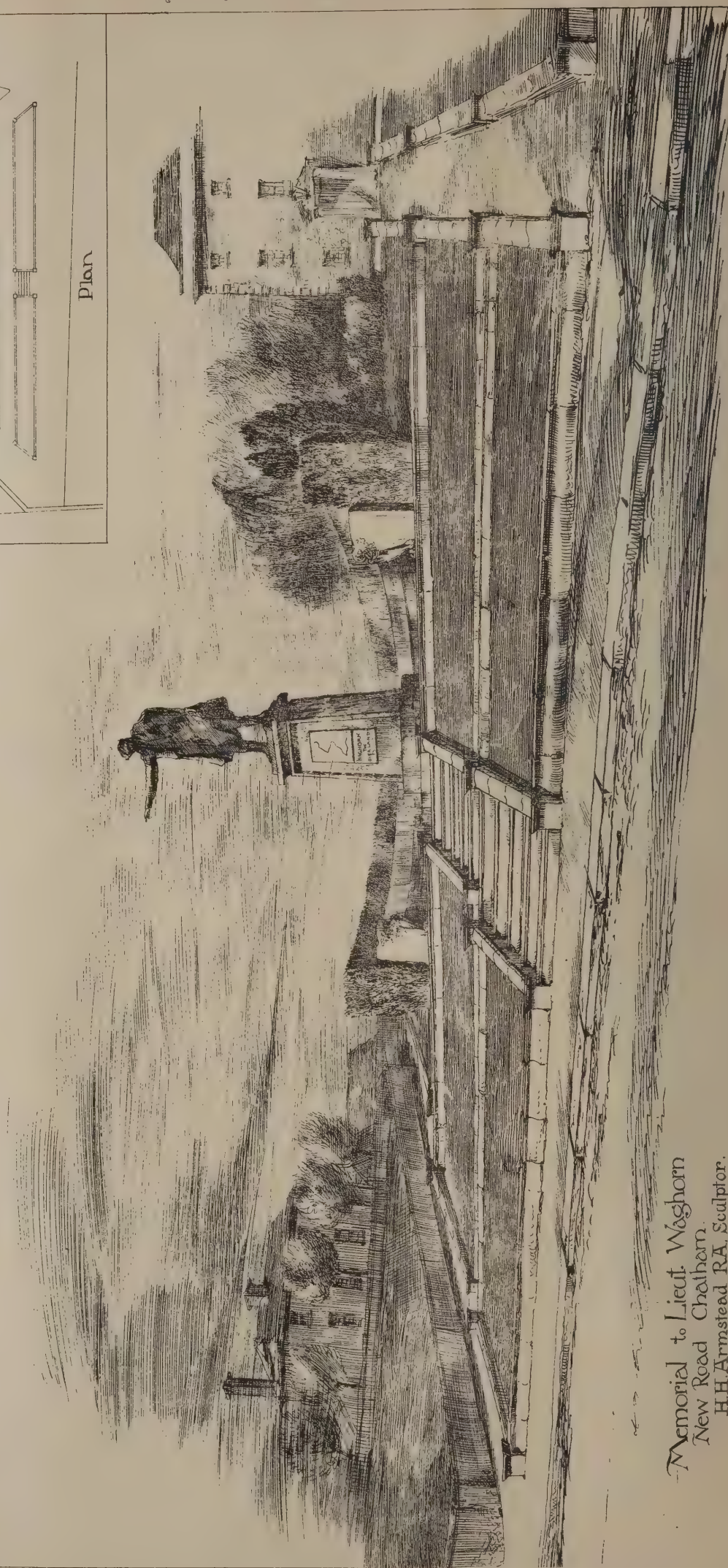






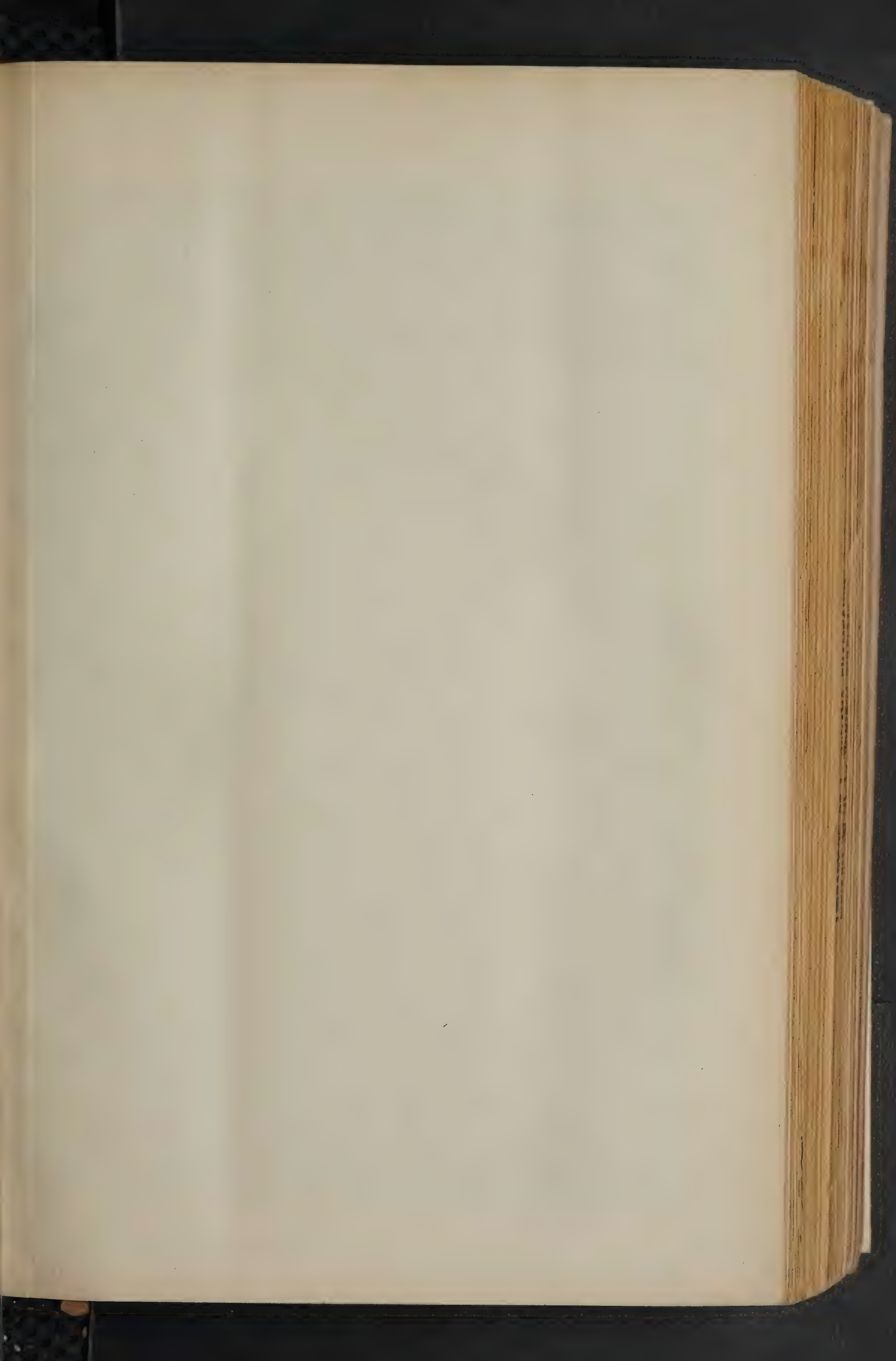


Plan

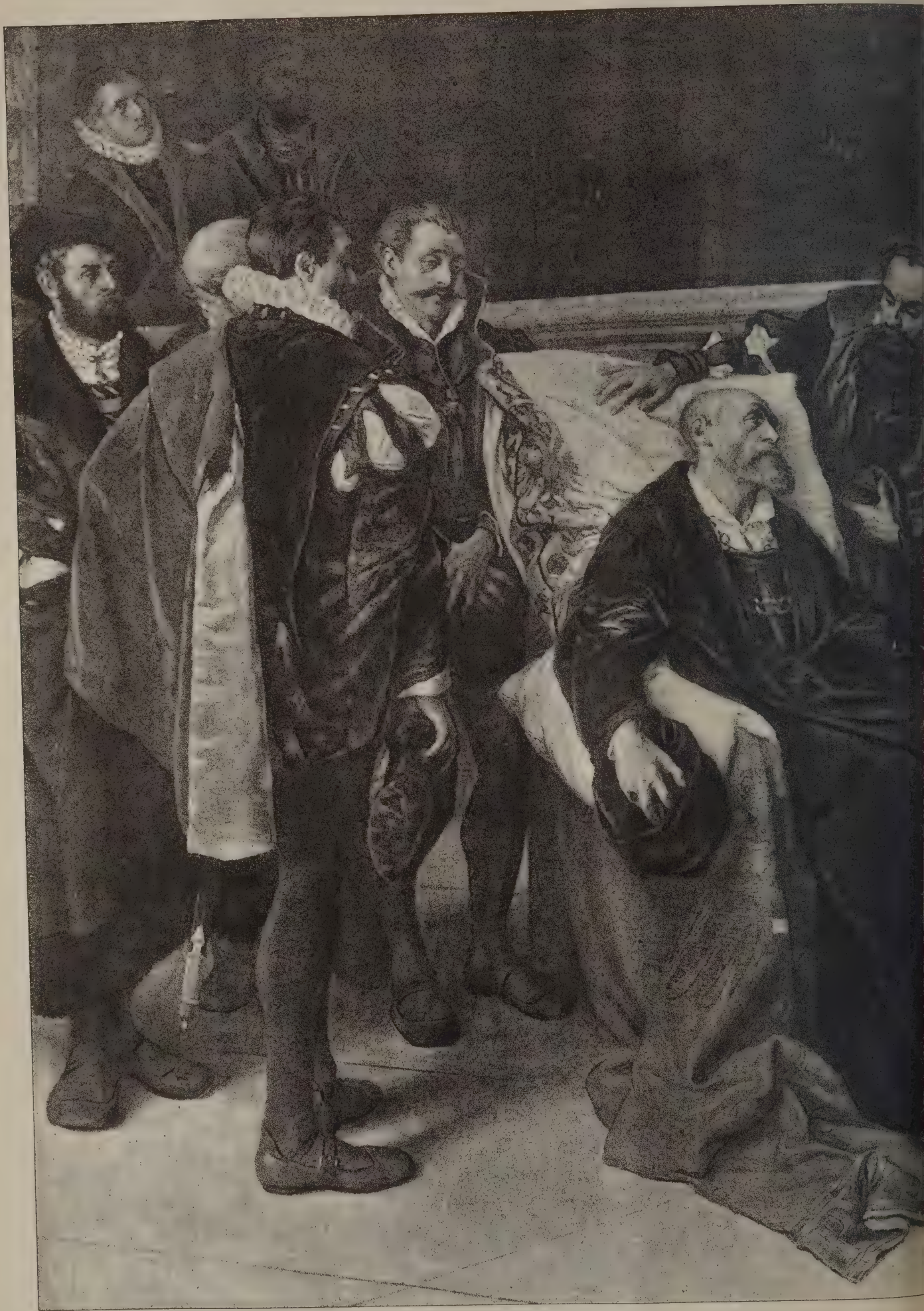


Memorial to Lieut. Waghorn  
New Road Chelham.  
H.H. Armistead R.A. Sculptor.  
John Belcher, Architect.









THE LAST MOMENTS OF

From the Paint by

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"THE PHOTO" SPRAGUE & CO. 22, MARTIN LANE, LONDON E.C.













Ashham Hall, near York, for Sir Andrew Fairbairn. ~~~~~

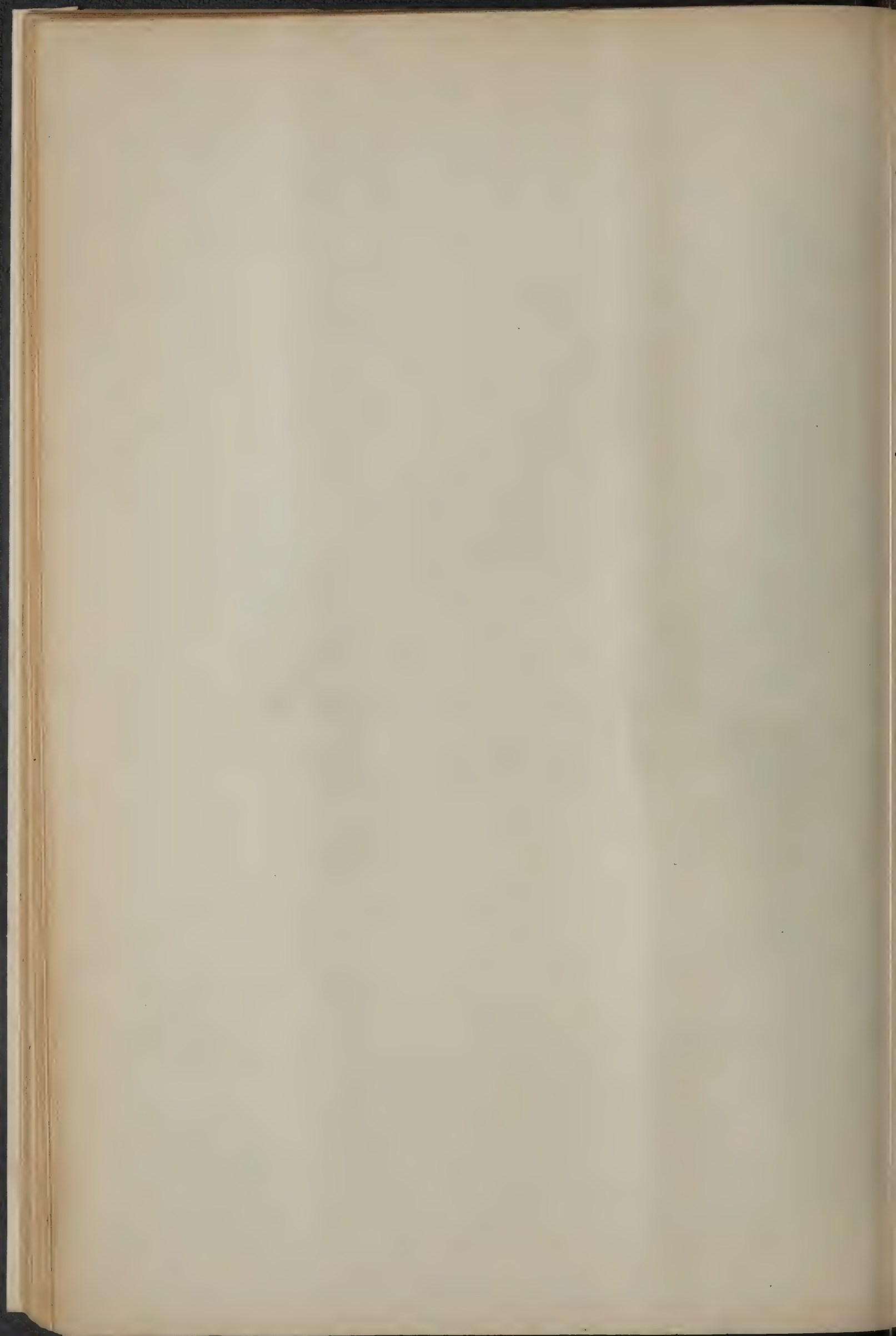




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• MARCVS • AURELIVS •

DRAWN BY GERALD HORSLEY.

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## ILLUSTRATIONS.

THE LAST MOMENTS OF CHARLES V.

**D**URING the first half of the sixteenth century the Emperor CHARLES V. was the most important man in Europe, and his biography would be a history of the Continent. It is supposed that he aspired to be more, and to have his supremacy recognised by kings and princes; but any ambition of that kind was not unreasonable, for his influence was felt outside his dominions. In the great soliloquy in "Hernani" VICTOR HUGO makes CHARLES express his theory of the world, and, however poetic may be the language, what is said seems to correspond with the belief of the Emperor's contemporaries. He desired to be a second CHARLEMAGNE, and Europe to be an edifice with two men at the summit, viz. the Pope and himself. The two were to be everything, and nothing was to exist on earth without their sanction, for a supreme mystery was exhibited in them. One was Truth, the other Force.

But, somehow, the world did not accept CHARLES's notions of what was best for everybody, and the ingratitude of people who were not proud to be under his feet at last made the Emperor weary. On October 25, 1555, he assembled all his magnates in Louvaine, and in their presence resigned his diadem. He reserved a pension of one hundred thousand crowns, which was to defray the cost of himself and his attendants in the monastery of Yuste. With his usual foresight he took care that his new abode was adapted to his altered condition. ROBERTSON says:—

Some months before his resignation he had sent an architect thither to add a new apartment to the monastery for his accommodation, but he gave strict orders that the style of the building should be such as suited his present situation rather than his former dignity. It consisted only of six rooms: four of them in the form of friars' cells, with naked walls; the other two, each 20 feet square, were hung with brown cloth, and furnished in the most simple manner. They were all on a level with the ground, with a door on one side into a garden, of which Charles himself had given the plan, and which he had filled with various plants, intending to cultivate them with his own hands. On the other side they communicated with the chapel of the monastery, in which he was to perform his devotions. Into this humble retreat, hardly sufficient for the comfortable accommodation of a private gentleman, did Charles enter, with twelve domestics only. He buried there, in solitude and silence, his grandeur, his ambition, together with all those vast projects which, during half a century, had alarmed and agitated Europe, filling every kingdom in it by turns with the terror of his arms and the dread of being subjected to his power.

The cloister life of CHARLES has been narrated by Sir WILLIAM MAXWELL STIRLING in a work which is likely to be esteemed as one of the classic histories. During three years the ex-Emperor led a life which was partly philosophic and partly monastic. It was, in fact, a continuous preparation for death. Services were performed almost every day as expiation for his own misdeeds or for those of his friends, and in these devotions CHARLES joined, reading out of a tattered prayer-book. At length he resolved to anticipate the days after his death by having a funeral service for himself. It was more than a rehearsal, and must have affected the gloomy spirit of CHARLES. What followed is thus described by Sir WILLIAM STIRLING MAXWELL:—

The funeral rites ended, the Emperor dined in his western alcove. He ate little, but he remained for a great part of the afternoon sitting in the open air, and basking in the sun, which, as it descended to the horizon, beat strongly upon the white walls. Feeling a violent pain in his head, he returned to his chamber and lay down. Mathisio, whom he had sent in the morning to Xarandilla to attend the Count of Oropesa in his illness, found him when he returned still suffering considerably, and attributed the pain to his having remained too long in the hot sunshine. Next morning he was somewhat better, and was able to get up to go to mass, but still felt oppressed, and complained much of thirst. He told his confessor, however, that the service of the day before had done him good. The sunshine again tempted him into his open gallery. As he sat there, he sent for a portrait of the Empress, and hung for some time, lost in thought, over the gentle face, which, with its blue eyes, auburn hair, and pensive beauty, somewhat resembled the noble countenance of that other Isabella, the great Queen of Castile. He next called for a picture of *Our Lord Praying in the Garden*, and then for a sketch of the *Last Judgment*, by Titian. Having looked his last upon the image of the wife of his youth, it seemed as if he were now bidding farewell, in the contemplation of these other favourite pictures to the noble art which he had loved with a love which cares and years and sickness could not quench, and that will ever be remembered with his better fame. Thus occupied, he remained so long abstracted and motionless, that Mathisio, who was on the watch, thought it right to awake him from his reverie. On being spoken to, he turned round

and complained that he was ill. The doctor felt his pulse, and pronounced him in a fever. Again the afternoon sun was shining over the great walnut tree full into the gallery. From this pleasant spot, filled with the fragrance of the garden and the murmur of the fountain, and bright with glimpses of the golden Vera, they carried him to the gloomy chamber of his sleepless nights, and laid him on the bed from which he was to rise no more.

The scene depicted by M. DE VRIENDT is where CHARLES looks on TITIAN's work for the last time. The artist has realised the scene with great power. But it is not surprising, for M. DE VRIENDT finds a peculiar interest in the history of CHARLES, and has painted many scenes of the eventful life of the Emperor.

ASKHAM HALL.

**W**E have already published one view of the exterior of the residence of Sir A. FAIRBAIRN, and now we give a second, which is no less picturesque in aspect. The architects of the building are Messrs. CHORLEY & CONNOR, of Leeds.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 5.—MEMORIAL TO LIEUTENANT WAGHORN. [J. BELCHER.]

NO. 6.—EQUESTRIAN STATUE OF MARCUS AURELIUS. [G. HORSLEY.]

UNIVERSITY COLLEGE ARCHITECTURAL  
CLASSES.

**T**HE following prizes and certificates have been awarded in the classes of Architecture under Professor T. Roger Smith, in University College, London:—

*Fine Art.*—Donaldson Silver Medal, E. A. Runtz, of London. Certificate, 2, Alan C. Walker, of Tasmania. 3 and 2nd Prize, Harold R. Luck, of London. Second Class.—B. F. Fletcher, of London; J. W. Little, of London; P. D. Smith, of London. Third Class.—M. A. Green, of Bath; E. A. Williams, of Upper Norwood; F. E. Williams, of London.

*Construction.*—Donaldson Silver Medal, Horace Helsdon, of London. 2nd Prize, Harold R. Luck, of London. Certificates: 3, Alan C. Walker, of Tasmania. 4, Wm. D. Claridge, of London. 5, J. W. Little, of London. 6, J. Borrowman, of Godalming. Second Class.—A. W. Carne, of St. Agnes; M. A. Green, of Bath; E. C. Hanson, of London; H. C. Lander, of London. Third Class.—A. Sealy-Allin, of co. Cork; E. Finch, of Roehampton; A. G. Turner, of Anerley; E. A. Williams, of Upper Norwood; F. E. Williams, of London.

*Modern Practice.*—Prizes, equal, Gordon P. G. Hills, of London; Alan C. Walker, of Tasmania. Certificates: 3, equal, Harold R. Luck, of London; Oscar Oertel, of London. 5, E. A. Hellicar, of Bromley. Second Class.—E. A. Williams, of Upper Norwood. Third Class.—M. A. Green, of Bath; H. Lazareck, of Aldershot; W. W. Wilson, of Leytonstone.

Professor Roger Smith's prizes for drawings illustrative of the work of the classes were awarded as follows:—*Fine Art* Prize divided between E. Runtz and A. C. Walker; *Construction* Prize divided between John Borrowman and H. C. Lander.

## THE DECORATION OF HOUSES.\*

**I**N my former lecture I said decoration was purely painters' or sculptors' work, but I then referred to animal or vegetable forms. The gift of harmonising colours may belong equally to the painter and the architect.

The schemes for decoration are purely architectural, not only when they apply to buildings, but also in the case of separate articles that are movable, and that are not wholly covered with one scheme of ornament, and for this reason, that architecture deals with harmonic proportions, and with the contrast of primitive forms. We are all entranced with the sublime conception and magnificent execution of Michel Angelo's frescoes in the Sistine Chapel, but no architect can help being shocked at his utter disregard of the chapel itself; the scale of the decoration utterly destroys the size of the chapel. Whether the ornament be painted or sculptured figures, landscape, floral design, or formal ornament, the most important thing is to make the whole look well and appropriate for its purpose. One of the great arts of the decorator is to arrange his spaces harmonically, with due consideration for the use of the object, and occasionally to cure defects in the floors, walls, or

\* From the Second Cantor Lecture, by Mr. G. Aitchison, A.R.A.



ceilings of a building, when the proportions are not all that can be wished.

To take a room for example; if it be too low to admit of figures being of an adequate size to be seen, they must be excluded, and even if there be plenty of height, we do not want the figures of such gigantic size that a fine room is dwarfed into a doll's house. Certain parts of a room, too, are better seen than other parts, and it is useless to put elaborate decoration on parts that are mostly hidden by pieces of furniture, or which one must go down on one's knees to see; we do not want a floor so decorated that it looks painful to walk on, or so ornamented that we think we may trip over the things portrayed; and I may say that perhaps the very worst fault ornament can have is a look of winking at you, or being in movement.

In choosing colour, again, we should be careful to have such a tone that we can live with, for most people have their dislikes and preferences. The colour of a lady's boudoir is mostly chosen because it sets off her complexion. In a room where we work we are soon conscious of an objectionable colour which irritates instead of soothing us. Certain colours and certain tones are beneficial or prejudicial to health; very dark rooms are prejudicial, and red or yellow will also have a prejudicial effect on our health, if we have to remain in rooms of either colour all day and every day. A manufacturer had a women's workshop painted yellow, and found more than the usual sickness amongst his hands; his doctor recommended whitewash, and the normal health was restored. Growers of hyacinths have noticed a marked effect on their blowing when they are put in glasses of certain colours.

Few of us can expect to live in houses built of polished granite, porphyry, and jasper, and adorned with precious stones, but we may expect to live in those protected and embellished with enamelled terra-cotta, glass slabs, or glass mosaic, and that our streets may at least present us with a clean, gay, and cheerful appearance, even if they do not quite realise M. Charles Garnier's dream of a transformed Paris:—

I imagine the day when the tawny tones of gold will pick out the monuments and construction of our Paris; I imagine the warm and harmonious tones that will tremble under the delighted gaze. One will then have renounced those grand straight-lined streets, beautiful no doubt, but cold and unnatural as the ceremony of a noble dowager. The inflexible Commission of Ways will have its period of reaction, and, without any one being hurt, every one will be allowed to build his house without making it match those of his neighbours; the grounds of cornices will shine with eternal colours, the piers will be enriched with glittering panels, and the gilded friezes will run the whole length of the buildings, the buildings themselves will be clothed in marble and enamel, mosaic will make every one love sparkle and colour. This will not be false and petty luxury, it will be opulence, it will be sincerity. The eye, familiarised with all the marvels of tints and splendours of colour, will insist that our dress shall be modified and coloured in its turn, and the entire city will have an harmonious reflection of silk and gold. But, alas! I look around me. I see a grey and sombre sky, I see newly-painted houses, I see the shadows quite black, that wave in the interminable boulevards; I see, in short, Paris as it is! And from my artist dream I fall again into vulgar reality.

This dream is by no means impossible. I may tell you that when I was at Berlin a good many years ago, I saw a mansion that the Italians would call a palace, wholly covered with a facing of compressed tiles in patterns, the dressings of the windows and the oriels wholly composed of Minton's majolica, with a glass mosaic frieze, adorned with subjects in colour on a gold ground. I could not help saying to myself, "Here is a palace adorned with coloured materials, all but the mosaic certainly of English manufacture, but we at home have neither the taste nor wit to use them." It is true that most of our majolica leaves much to be desired in beauty of shape, in quality, tone, and arrangement of colour; but these defects could be amended if there were demand enough for skilled architects, designers, and colourists. Enamelled pottery does not do well as a rule with dull granulated surfaces. Even when new it requires a very able architect to use it properly, and in London it becomes staring, as the rough material is blackened by soot. Where granulated surfaces must be used, enamelled pottery might still be applied in very small pieces to give value to the colours of the main materials, just as nature colours a pistil, a stamen, or a spot with one complementary primary to set off another, or a secondary, or a tertiary.

There is in Oxford Street an eating or coffee-house wholly fronted with enamelled pottery that is absolutely unimpeachable, only the architect or the owner had the fear of fools upon him, and declined to give us splendour or gaiety.

If any one would start a gorgeous front of enamelled pottery there would be an outcry at first, but we should gradually get accustomed to beauty and colour, and get reconciled to the loss of dingy and blackened brick. Even now there is no outcry when the platforms of a railway station are lined with white glazed bricks banded with green or grey, and the small extra cost would soon be repaid by better health and the saving of painting. At first this could only be done by tasteful,

benevolent, and patriotic men who were wealthy, or by enterprising ones, who thought a house so fronted would advertise itself; but as this sort of facing came into fashion—as it certainly would—window jambs and reveals, panels, strings, and cornices would be kept in stock, probably printed in colours instead of hand-painted, and would be cheap enough. The gorgeous colours of the Persian tiles are now rivalled by De Morgan, who has, too, rediscovered the crimson metallic glaze of Maestro Giorgio, and he could design, paint, and burn a brick as well as a tile or a pot.

There is one use of enamelled pottery I have not mentioned, roofing tiles. In parts of France and Italy these prevail. At Lugo, in the Romagna, I saw the steeple of a church covered with enamelled pottery of different colours, which wound round it, the steeple being a cone; the visible glazed parts were semicircular in section, and though I do not know how they were fixed, they looked as if they were stuck into mortar, like the enamelled terra-cotta cones found at Babylon, and used to ornament wall surfaces. Most of the tile patterns I have seen in France are, to say the least, more ingenious than beautiful; but there are gold and green tiles used at Vienna and at Botzen that are ornamental enough, and the Chinese glazed yellow tiles seem to look well in the drawings of Chinese buildings.

Even the Romans were more alive to the use that might be made of broken glass than we are, for we learn from Martial that the collection of broken glass was a trade, and the glass, he says, was exchanged for brimstone matches. Some believe it was treated with sulphur and cast (I presume into slabs), mostly made to imitate agate, jasper, lapis-lazuli, or some precious stone, and used for pavements, wall linings, and the like. It probably was from such slabs that the glass mosaic was first chipped off. We know from Pliny the elder that glass was used by Scaurus for the decoration of one storey of his temporary theatre, and it is conjectured that this glass was the cast slabs before mentioned.

I cannot say how these glass slabs or tiles would stand our climate, but if they could be fixed in no other way, they might be set in frames of cast-iron, barfed. Many of you probably know how glass mosaic is made. Generally the colour pervades the whole thickness of the glass, the glass is cut into strips, and is then roughly chipped off into cubes; the best mosaic was chipped into very small cubes, from 3-16ths to 5-16ths of an inch square, but the commoner sort is from 3-8ths to 1-2ths; the metallic glass mosaic consists of a leaf of red, yellow, or green gold, or of silver laid on to a glass body, then covered with a thin coat of glass and the two fused together. You may see, in the Early Christian glass medallions, the gold leaf attached to the lower glass, etched into heads of holy personages, Christian stories or symbols, and then a thin coat of transparent glass fused on.

In the modern Roman gold mosaic, the body is of opaque red glass, but in the Venetian, Sicilian and Oriental varieties, the backing is of transparent glass, often of a greenish hue, which is much less hot in appearance than the other, for the gold rarely fills the whole field, and the glass beyond it shows.

The word mosaic comes from "Opus Musivum"—work of the Muses—or, as we should say, artistic work. At present the Mosaicists are very far from deserving the name of artists, or being classed with the *Maîtres Mosaistes* of George Sand. The artist who designs and colours the cartoons has to mark on his design every tessera to be used; the mechanic fits these according to the shape or colour from trays containing the different colours, and the whole is pasted on to brown paper, which is cut into short lengths, rolled up and sent here from Venice—at least, up to a late date, Venice was the seat of the manufacture both of the raw material and the finished work—then unrolled, pressed into the mortar called *mastic*, the paper washed off and the mosaic driven in with wooden mallets. If we are ever to have work of the highest excellence the mosaic worker should put his own lines on the cartoon, *i.e.*, translate it as he works it, and arrange the tints so as to get the effect the artist shows, and should be skilful enough to re-do such parts as require it in place; the exact effect can never be known until it is fixed. If the mosaic workers were good enough to do this, and were properly paid for their skill, we should soon have artists who worked wholly in mosaic, who would know how the effect wanted was to be obtained. You must recollect that in church work and in large public buildings the mosaic is generally at a great height from the eye, and more often than not, inside a dome, a half-dome, or a vault. These curved surfaces have their own lights and shades, and even at a great height the colours required are often better produced by the intermixture of tesserae of pure colour than by matching the exact colour of each tessera in the cartoon. Perhaps the most lovely coloured mosaics that exist are at St. Vitale, and in the tomb of Galla Placidia, at Ravenna, executed in the time of Justinian. That in the tomb of Galla Placidia has a blue ground like a peacock's neck, and is ornamented with gold ornament. In the half-domes of apses, where very old work exists, we are often surprised at its superiority in tone to new



work, which often looks like painting on a brass basin, and it is not until the half-dome is reached by a ladder that you find out the reason. In modern work the mastic is flush with the mosaic, but in old work very long slips of glass mosaic were used instead of the ordinary tesserae, and only held at the end by the mastic, so that there is shadow all round them. The gorgeousness of colour obtained by this material can only be judged of at Rome, Venice, and Ravenna, near home, though I believe there are still finer specimens at Constantinople, Damascus, and Jerusalem. Very ingenious parodies of pictures can be made with mosaic. If they will stand a fire they might be valuable by preserving the form, and a notion of the colour of the masterpieces of great artists. Raphael's "Transfiguration" in St. Peter's at Rome is the most celebrated of these. They were mostly used for ornamenting the gold and silver gilt covers of books, and now for ornamenting jewellery, and are said to be set in wax. When smooth they are not very effective, though when the surface is left rough they tell as colour very fairly. For internal work mosaic pictures composed of tesserae of marble or pottery answer, but wholly lack the gorgeousness of glass mosaic. Mosaic for pavements I reserve for another place.

I hardly know if I should include sgraffito. It would certainly be useless in the denser parts of London, as it would soon be a uniform dingy black; but we know that there are still examples that are visible at South Kensington, and that it lasts well in the country.

It is done in this way:—Any coloured ground that may be chosen is first prepared of mortar or cement, coloured with earthy or mineral pigments; it is then laid on the wall. White, black, yellow, red, or grey are the usual colours. On one of these grounds before it is dry about one-eighth of an inch of cement of one of the other colours is laid, the pattern is pounced on, and the parts outside the pouncing are scraped off with a modelling tool, a knife, or a bit of stick. When the whole has set, you have a picture or a pattern in two colours. This sort of work has stood in England for over twenty years when executed in the country, and in Italy the whole fronts of many large palaces have been adorned in this way, and have stood for centuries.

Public buildings built of polished marble, granite, porphyry, jasper, agate, or onyx, or faced with these, are sometimes ornamented by inlaying pictures or patterns with coloured marble or precious stones, but I do not know of any external example in England. This work is called *pietra dura*. The Taj Mahal in India is a celebrated example. There are plenty of slabs, basins, vases, paper-weights, and jewellery imported from India and Italy of *pietra dura* work.

All external work in calcareous marbles soon perishes in the atmosphere of London, whether plain or inlaid, and all incised work filled with mastic so soon gets blackened that to execute it is merely labour lost. The only other work that can be used externally is in metal. Iron rusts unless constantly painted, and almost all other metals turn black. An insurance office in the Poultry was covered with copper scales that flamed in the sun, but after a few months' exposure they became as black as ink, and what does not oxidise to blackness is covered with a black pall of soot; bronze gets nearly as black as copper, but it has of course a slight diversity of hue. Real block tin, not tinned iron, is said to stand the climate of London, but of course does not lack its pall of soot. Iron plates tinned are much used in Switzerland for the covering of steeples, but even there they get rusty. Lead takes its own blackish grey, but as it otherwise stands the climate well, I wonder it is not more used for ornamental purposes, as vases, statues, roof-crests, and the like. When I was a boy, some plumbers' shops were ornamented with leaden statues, vases, and ornamental cistern fronts. Lead is still used for ornamental roof-crests in France, often heightened by gold, black varnish, and colour. Lead is still much used for ornamental accessories in Holland—or perhaps I ought to say, was once used. I only know that there were many such when I went there in my youth; and they were much used over here during William III.'s reign. Up to a short time ago there were leaden statues and vases in the gardens of the stately mansions in Mark Lane, near the Tower of London; there are still some at Hampton Court, and they would do very well in the niches or on the pedestals of our red brick fronts, if we could not afford bronze.

It is unnecessary to speak of the ordinary freestones that weather in London, such as Portland, Chilmark, Tisbury; the sandstones, red Mansfield and Dundee, which we all know; nor brick, both cut and moulded, nor red, yellow, or grey terracotta, for all these have more or less granulated surfaces that can only be cleaned by tooling or rubbing, but plaster has never of late, as far I know, been even tried; I mean plaster of common sand and lime, or, what is still better, of lime and marble dust. Vitruvius tells us that old Roman walls covered with this material were so hard, so beautiful and so finely polished, that in his time slabs of it were cut out and used for table tops. In speaking of plaster, I did not mean compo, either Roman, Portland, or mastic, but that plaster that is made

workable for modelling, which the Italians call "gesso duro." It was once common in England; the "Peter Pindar," in Bishopsgate, is an example or was an example a few years ago, and many admirable specimens still exist in our country towns. Some of the vaulted ceilings of Hadrian's Villa, at Tivoli, now open to the air, are still adorned with it, the grace, freedom and delicacy of whose modelling we still admire, although it was done at least 1700 years ago. In few things has England declined more than in plastering, from the prevalence of casting, which allows the employment of the least skilled mechanic. Most of us have seen the magnificent ceilings of Elizabeth, James and Charles I.'s time, on whose flowers, fruit, &c., you can even now see the grain of the plasterer's hand and the holes made by his thumb to get shadow. Even in plastered ceilings of Sir W. Chambers's time, who died in 1796, you see beautiful work in high relief of fruit, flowers and foliage, and I believe the skill did not die out completely till the end of the first quarter of this century. Not twenty years ago a clerk of the works offered to reveal the secret of "gesso duro" to me if he were given the job of executing by stamps some embossed plasterwork I had to do, but the owner of the house would not go to the expense, so cast slabs were used, and the clerk of the works said the secret he had learnt from an Irish plasterer should die with him. The infinite variety that hand-stamping produces would to refined tastes be worth the expense, for cast work is all alike. In the case before mentioned, to have introduced intentional variety would have been even more costly than stamping.

Do not suppose I am finding fault with these excellent materials, Roman and Portland cement, or even mastic. All I mean is that, as yet, we have found no way of using them ornamentally in London, except as imitation of stone and stone-carving. If we had a pure atmosphere, the two first would be invaluable for inlaying, but in a very short time stone and inlay are indistinguishable from the general grime, and that too even when the inlay is black mastic.

At the Alhambra, Granada, the plasterwork seems to have been carved by hand. You still see uncarved patterns with the spacing marked out by sunk lines.

The late water-colour artist, Mr. Lundgreen, once described to me his seeing a plasterer execute an elaborate ceiling of a tomb in India by working out the pattern with a lath on the wet plaster. So extraordinary did this skill appear to him that he watched the plasterer the whole day, and at night told his dragoman that he was the cleverest artist he ever saw. The dragoman maintained that he was a very stupid fellow, and said his father was a clever fellow. He could do five patterns; he had five sons, all of whom could do three or four patterns, but this man was so stupid he could never learn but two; the artist was less surprised when he found the man had been all his life at two patterns only.

In the present day most of our internal plasterwork of any pretension is done in canvas plaster. A thin coat of fine plaster of Paris is brushed into the mould, very thin open canvas in strips is pressed into this, and brushed over with coarse stuff; the whole is then stiffened with slips of wood, attached to the backing with canvas and plaster; it is then dried in a hot room, and screwed up in its place, and can be painted on at once; its greatest merit is its lightness. The day after the late Lord Derby dined at one of the City Companies' Halls a rose out of the coffered ceiling fell down, and smashed the solid mahogany dining-table. The defects of canvas plaster are its want of flatness in the larger panels, and of straightness in the cornices.

Bronze, though it becomes a blackish green, has this advantage for the decoration of buildings, that it can be reproduced as often as you please from the modelled clay of the statuary. You may, therefore, get through its means first-rate work at a low cost, if the repetition is great, and its use may be called benevolent as well, for it does not condemn skilful men to the brainless work of constantly reproducing the same thing.

It is needless to speak of wrought-iron, which can be made into any form you like, and of any size and thickness from the stem of an anchor to a leaf, and chased or engraved, polished or lacquered, tinned or gilt. I am happy to say that wrought ironwork is receiving great attention again both from architects, painters, and ironworkers, and can be made nearly as well as it ever could. I think cast-iron has been needlessly neglected in this truly iron age. You cannot get the fineness of bronze, and you cannot chase it, but you can get really beautiful work done in it, and the wit of man can never be better employed than in using good materials at hand in the proper way, *i.e.*, by only asking them to do what they can do readily and properly. As far as I know, the only real drawback to cast-iron is its liability to rust. If Mr. Barff's process can be applied cheaply, and will resist the attacks of the atmosphere for a long time, all we have to put up with is blackness, and if the parts of a front we must have blank were filled in with glass slabs, you need have very little more black than you want. Considering how much we want light, and how dear ground is in London, it does seem very odd that cast-iron is not more used.

Cast-iron is a difficult material to use; I mean, it wants to be



calculated for its strength, it requires much thought to ornament, and everything, even to a bolt hole, has to be settled beforehand, and, except there is much repetition, it is costly. Its neglect is greatly owing to this, that no one will pay for the extra skill, time, and trouble required of the architect, so this admirable material is almost ignored. The iron statue of Epaminondas is spoken of by Pausanias, and some scholars think it was of cast-iron; at any rate Pausanias tells us "The Samian Theodorus was the first discoverer of fusing and making statues in iron," so Mr. Ruskin's diatribe against cast-iron statues seems to be uncalled for.

If people were as good judges of art and skill as they are of port wine, they would not think it extraordinary that it was paid for in the same ratio; the amateur of port who pays three guineas a bottle for it, neither envies him who drinks it at 1s. 9d. a bottle, nor thinks his wine merchant a swindler for charging him the higher price. As regards marble I cannot quite agree with M. Charles Garnier, "that even when it has lost its polish it still looks like a shabby gentleman, and is not to be mistaken for a vulgar fellow in his Sunday clothes." Except in rainy weather, when the marble is temporarily polished by the wet, its unpolished surface, in my opinion, cannot be regarded as worth the outlay; and I say this with hesitation and regret, for the exquisite harmonies produced by the decayed marble of St. Mark's was a thing to be remembered; still, as an architect, I cannot reconcile myself to using a precious material merely to give a flavour when I know that, in giving it, it is going to decay; I might, perhaps, if I were a painter. But for the inside of a building marble is the richest material you have for the production of lovely colour—music without words—painted as it is by nature's hand, with every tint and tone of delicacy and subtleness, and enlivened too by the wildest caprices of beauty.

The bar to its use in England is the damp, for when the air is full of vapour the marble condenses the moisture, which stands on it in drops or trickles down it. But as most houses and buildings are now warmed, this need not stand for much, and if we panel our rooms below with wood, there is no reason why the upper part should not be of marble. Few of us know the wealth of England in marbles, but so little is it used that it is hardly worth the quarry-owners' while to exhibit adequate specimens of their treasures. We all know the commoner sorts of Devonshire, and some of the beautiful serpentines of Cornwall. Are we equally well acquainted with the lovely Irish green, superb black, and its red; with the beautiful green of Anglesea, and the Scotch and Irish porphyries? Marbles are of every hue except blue, for blue Belge is black and white, and blue Napoleon or Imperial is but bluish-grey, and brown is scarce, though we have rosewood marble and Californian spar. Marbles are found in most countries of the world, and there are such vast varieties in Europe that they can hardly be catalogued.

During my lifetime many of the old abandoned quarries of the Romans have been rediscovered, so that Giallo antico, rosso antico, and other antique marbles have lost their preciousness in value and their epithet. The Romans had a much more pronounced taste for colour than the Greeks seem to have had, and were enthusiastic admirers of marble. There are still miles of buried marble on the banks of the Tiber, awaiting a revival of this splendid taste. It is only quite lately that any appreciation of what polished marble can do for us has revived, and there are still but few examples of the use of fine marbles in large masses. Still, fine examples may be seen in the staircases at Dorchester House and Goldsmiths' Hall, and in halls at the Holborn Restaurant and the National Gallery. The late Mr. Burges had the upper part of his dining-room lined with red Devonshire. In Italy the former passion for marble may be seen in buildings of Roman, Byzantine, Romanesque, Gothic, and Renaissance times, i.e., at Rome, Ravenna, Venice—especially at St. Mark's—at some of the churches at Genoa, at Pisa, and in the mausoleum of the Medici at Florence. Great taste in colour is requisite for the proper arrangement of coloured marbles. At present no one cares to exercise this taste as a profession, as there is so little effective demand, and in spite of the low tone of marble generally, it is much easier to make a vulgar or discordant arrangement than a strikingly good or harmonious one. The fashion of using white marble chimneypieces, white marble bas-reliefs, white marble statues and busts in decorated apartments, is absolutely fatal to low-toned schemes of colour decoration, and as a rule all gorgeous schemes of colour are low-toned, and white must then be used most sparingly as a jewel. White can only be sparingly ornamented with morsels of full colour, or very high-toned decoration must be used in conjunction with it, as this alone can sustain masses of white.

Sculptors, unhappily, have a tradition that deep red is a good background, but as green is its complementary, red makes the statues or bas-reliefs look even colder than the natural colour of white marble.

Considering the wealth of this country, which mainly goes in useless feasting, useless men and maid-servants, useless

carriages and horses, and hideous as well as useless clothes, I do not think those who will not use marble from poorness of spirit are included in the beatitudes.

As I am now on marbles, I may as well include mosaic pavements. These must be greatly restricted in so cold and damp a place as England. Few of us love to walk on a marble floor without shoes or stockings, as all would do in a warm or hot climate, but it can be used for the pavement of Protestant cathedrals, for hall floors, for the centre aisles of churches, for conservatories, porches, terraces, and the like; and when we can afford it porphyry is by far the best material for the patterns, as it only polishes by the friction of dusty boots, unlike marble, which roughens, and unpolished marble is not more attractive than stone. Plain geometrical and flat floral patterns are the best, in marble or pottery floor mosaic, for the smallness of the pieces rather helps the scale of the room or building, and does not ruin it like marble squares. The effect of a geometrical pattern in porphyry on a white marble ground, called, after Severus Alexander, *Opus Alexandrinum*, looks very splendid in the basilicas at Rome. Though, as a rule, man's work, when not too bad, must be always most pleasing to mankind, we want occasional variety, and some of the pavements composed of mere lumps of finely-coloured marbles like gigantic breccia is a pleasing contrast and change from too much of man's handiwork, and I cannot conceive any pavement of more imperial magnificence than some of those Roman floors said to have been made of lumps of lapis-lazuli.

The objection to pottery as mosaic in floors is its softness, so that it soon wears away under much traffic. Figure pictures, for a floor to be walked on, are a mistake, though they may be used as a centre-piece to be looked at from above, and be surrounded by plants or flowers; but nothing can be more appropriate for internal wall decoration than figure subjects, or floral ornament in marble or tile mosaic: in either case it is permanent, and can easily be cleaned, and that in marble, at least, must be low in tone, for it can have but two colours of complete purity, white and black.

England has got rich these last sixty years by flooding the world with rubbish, so nothing can be more patriotic than having a piece of the best workmanship you can obtain put in your house, and by that I mean attached to the freehold, if it be your own; and let this piece be adorned by the hand of an artist, for his workmanship is transcendental; and, if possible, let it portray a noble example, or evoke a noble reminiscence, and be of such materials that it cannot well be sold or destroyed for the value of the material. A modelled terracotta frieze or panel is valueless except for the art, and has the very touch of the artist's tool upon it, and if you can get a painter to make it also beautiful with colour, or have it enamelled in colour from a painter's cartoon, you will have two of the highest forms of beauty to enjoy while you live, and you will leave the best of all possible heir-looms to your children and to posterity, except a name or wisdom, courage, and integrity.

Although it is very mortifying that your landlord should steal a beautiful thing, and one probably costly as well, perhaps even destroy it, we should draw on our philosophy, and feel that it is worse still to lose the embellishment and ennobling of life; so that, if our leasehold is not very short, I think we may resign ourselves to casting our bread upon the waters.

## Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

### THE SECRET HISTORY OF BLENHEIM.

IN Mr. Leslie Stephen's sketch of the life of the Duke of Marlborough, published in the excellent "Dictionary of National Biography," there is a short reference to the building of Blenheim—a house which has obtained a new mistress. It is said that the Duchess quarrelled with Vanbrugh—partly for her dislike to spend money on the building, and partly because the architect acted as an agent in arranging a marriage between the granddaughter of the Duchess and the Duke of Newcastle. The relations between Vanbrugh and the Duchess of Marlborough are described in a book where a subject of the kind may seem inapposite, viz., the "Curiosities of Literature," and as Isaac Disraeli's narrative must always have interest for architects, we have thought it worth reprinting among our "Bygones":—

The secret history of this national edifice derives importance from its nature, and the remarkable characters it involved in the unparalleled transaction. The great architect when obstructed in the progress of his work by the irregular payments of the workmen, appears to have practised one of his own comic plots to put the debts on the hero himself; while



the Duke, who had it much at heart to inhabit the palace of his fame, but tutored into weariness under the vigilant and fierce eye of Atossa would neither approve nor disapprove, silently looked on in hope and in grief, from year to year, as the work proceeded, or as it was left at a stand. At length we find this *comédie larmoyante* wound up by the Duchess herself, in an attempt utterly to ruin the enraged and insulted architect.

Perhaps this is the first time that it was resolved in Parliament to raise a public monument of glory and gratitude—to an individual! The novelty of the attempt may serve as the only excuse for the loose arrangements which followed after Parliament had approved of the design, without voting any specific supply for the purpose. The Queen always issued the orders at her own expense, and commanded expedition; and while Anne lived, the expenses of the building were included in Her Majesty's debts, as belonging to the civil list sanctioned by Parliament.

When George I. came to the throne, the Parliament declared the debt to be the debt of the Queen, and the King granted a privy seal as for other debts. The Crown and the Parliament had hitherto proceeded in perfect union respecting this national edifice. However, I find that the workmen were greatly in arrears; for when George I. ascended the throne, they gladly accepted a *third* part of their several debts.

The great architect found himself amidst inextricable difficulties. With the fertile invention which amuses in his comedies, he contrived an extraordinary scheme, by which he proposed to make the Duke himself responsible for the building of Blenheim!

However much the Duke longed to see the magnificent edifice concluded, he showed the same calm intrepidity in the building of Blenheim as he had in its field of action. Aware that if he himself gave any order, or suggested any alteration, he might be involved in the expense of the building, he was never to be circumvented—never to be surprised into a spontaneous emotion of pleasure or disapprobation; on no occasion, he declares, had he even entered into conversation with the architect (though his friend) or with any one acting under his orders—about Blenheim House! Such impenetrable prudence on all sides had often blunted the subdulous ingenuity of the architect and plotter of comedies!

In the absence of the Duke, when abroad in 1705, Sir John contrived to obtain from Lord Godolphin, the friend and relative of the Duke of Marlborough, and probably his agent in some of his concerns, a warrant, constituting Vanbrugh *surveyor, with power of contracting on the behalf of the Duke of Marlborough*. How he prevailed on Lord Godolphin to get this appointment does not appear—his lordship probably conceived it was useful, and might assist in expediting the great work, the favourite object of the hero. This warrant, however, Vanbrugh kept entirely within himself; he never mentioned to the Duke that he was in possession of any such power; nor, on his return, did he claim to have it renewed.

The building proceeded with the same delays, and the payments with the same irregularity; the veteran now foresaw what happened, that he should never be the inhabitant of his own house! The public money issued from the Treasury was never to be depended on; and after 1712, the Duke took the building upon himself, for the purpose of accommodating the workmen. They had hitherto received what was called "Crown pay," which was high wages and uncertain payment—and they now gladly abated a third of their prices. But though the Duke had undertaken to pay the workmen, this could make no alteration in the claims on the Treasury. Blenheim was to be built for Marlborough, not by him; it was a monument raised by the nation to their hero, not a palace to be built by their mutual contributions.

Whether Marlborough found that his own million was slowly impairing, and the Treasury was still obdurate, or that the architect was still more and more involved, I cannot tell; but in 1715, the workmen appear to have struck, and the old delays and standstill again renewed. It was then Sir John, for the first time, produced the warrant he had extracted from Lord Godolphin, to lay before the Treasury; adding, however, a memorandum, to prevent any misconception, that the Duke was to be considered as the paymaster, the debts incurred devolving on the Crown. This part of our secret history requires more development than I am enabled to afford: as my information is drawn from "the Case" of the Duke of Marlborough in reply to Sir John's depositions, it is possible Vanbrugh may suffer more than he ought in this narration; which, however, incidentally notices his own statements.

A new scene opens! Vanbrugh not obtaining his claims from the Treasury, and the workmen becoming more clamorous, the architect suddenly turns round on the Duke, at once to charge him with the whole debt!

The pitiable history of this magnificent monument of public gratitude, from its beginnings, is given by Vanbrugh in his deposition. The great architect represents himself as being Comptroller of Her Majesty's Works; and as such was

appointed to prepare a model, which model of Blenheim House Her Majesty kept in her palace, and gave her commands to issue money according to the direction of Mr. Travers, the Queen's Surveyor-General; that the Lord Treasurer appointed Her Majesty's own officers to supervise these works; that it was upon defect of money from the Treasury that the workmen grew uneasy; that the work was stopped till further orders of money from the Treasury; that the Queen then ordered enough to secure it from winter weather; that afterwards she ordered more for payment of the workmen; that they were paid in part; and upon Sir John's telling them the Queen's resolution to grant them a further supply (*after a stop put to it by the Duchess's order*), they went on and incurred the present debt; that this was afterwards brought into the House of Commons as the debt of the Crown, not owing from the Queen to the Duke of Marlborough, but to the workmen, and this by the Queen's officers.

During the uncertain progress of the building, and while the workmen were often in deep arrears, it would seem that the architect often designed to involve the Marlboroughs in its fate and his own; he probably thought that some of their round million might bear to be chipped, to finish his great work, with which, too, their glory was so intimately connected. The famous Duchess had evidently put the Duke on the defensive; but once, perhaps, was the Duke on the point of indulging some generous architectural fancy, when lo! Atossa stepped forwards and "put a stop to the building."

When Vanbrugh at last produced the warrant of Lord Godolphin, empowering him to contract for the Duke, this instrument was utterly disclaimed by Marlborough; the Duke declares it existed without his knowledge; and that if such an instrument for a moment was to be held valid, no man would be safe, but might be ruined by the act of another!

Vanbrugh seems to have involved the intricacy of his plot, till it fell into some contradictions. The Queen he had not found difficult to manage; but after her death, when the Treasury failed in its golden source, he seems to have sat down to contrive how to make the Duke the great debtor. Vanbrugh swears that "he himself looked upon the Crown as engaged to the Duke of Marlborough for the expense; but that he believes the workmen always looked upon the Duke as their paymaster." He advances so far as to swear that he made a contract with particular workmen, which contract was not unknown to the Duke. This was not denied; but the Duke in his reply observes, that "he knew not that the workmen were employed for his account, or by his own agent"—never having heard till Sir John produced the warrant from Lord Godolphin, that Sir John was "his surveyor!" which he disclaims.

Our architect, however opposite his depositions appear, contrived to become a witness to such facts as tended to conclude the Duke to be the debtor for the building; and "in his depositions has taken as much care to have the guilt of perjury without the punishment of it, as any man could do." He so managed, though he has not sworn to contradictions, that the natural tendency of one part of his evidence presses one way, and the natural tendency of another part presses the direct contrary way. In his former memorial the main design was to disengage the Duke from the debt; in his depositions the main design was to charge the Duke with the debt. Vanbrugh, it must be confessed, exerted not less of his dramatic, than his architectural genius, in the building of Blenheim!

"The Case" concludes with an eloquent reflection, where Vanbrugh is distinguished as the man of genius, though not, in this predicament, the man of honour. "If at last the charge run into by order of the Crown must be upon the Duke, yet the infamy of it must go upon another, who was perhaps the only architect in the world capable of building such a house; and the only friend in the world capable of contriving to lay the debt upon one to whom he was so highly obliged."

There is a curious fact in the depositions of Vanbrugh, by which we might infer that the idea of Blenheim House might have originated with the Duke himself: he swears that "in 1704 the Duke met him, and told him *he* designed to build a house, and must consult him about a model, &c; but it was the Queen who ordered the present house to be built with all expedition."

The whole conduct of this national edifice was unworthy of the nation, if in truth the nation ever entered heartily into it. No specific sum had been voted in Parliament for so great an undertaking; which afterwards was the occasion of involving all the parties concerned in trouble and litigation, threatened the ruin of the architect, and I think we shall see, by Vanbrugh's letters, was finished at the sole charge, and even under the superintendence, of the Duchess herself! It may be a question whether this magnificent monument of glory did not rather originate in the spirit of party, in the urgent desire of the Queen to allay the pride and jealousies of the Marlboroughs. From the circumstance to which Vanbrugh has sworn, that the Duke had designed to have a house built by Vanbrugh, before



Blenheim had been resolved on, we may suppose that this intention of the Duke's afforded the Queen a suggestion of the national edifice.

Archdeacon Coxe, in his life of Marlborough, has obscurely alluded to the circumstances attending the building of Blenheim. "The illness of the Duke, and the tedious litigation which ensued, caused such delays that little progress was made in the work at the time of his decease. In the interim a serious misunderstanding arose between the Duchess and the architect, which forms the subject of a voluminous correspondence. Vanbrugh was in consequence removed, and the direction of the building confided to other hands, under her own immediate superintendence."

This "voluminous correspondence" would probably afford "words that burn" of the lofty insolence of Atossa, and "thoughts that breathe" of the comic wit; it might too relate, in many curious points, to the stupendous fabric itself. If her Grace condescended to criticise its parts with the frank roughness she is known to have done to the architect himself, his own defence and explanations might serve to let us into the bewildering fancies of his magical architecture. Of that self-creation for which he was so much abused in his own day as to have lost his real avocation as an architect, and condemned for posterity in the volatile bitterness of Lord Orford, nothing is left for us but to suffer our own convictions—to behold, and to be for ever astonished! But "this voluminous correspondence!" Alas! the historian of war and politics overlooks with contempt the little secret histories of art, and of human nature!—and "a voluminous correspondence" which indicates so much, and on which not a solitary idea is bestowed, petrifies our curiosity.

Of this quarrel between the famous Duchess and Vanbrugh I have only recovered several vivacious extracts from confidential letters of Vanbrugh's to Jacob Tonson. There was an equality of the genius of *invention*, as well as rancour, in her Grace and the wit; whether Atossa, like Vanbrugh, could have had the patience to have composed a comedy of five acts I will not determine; but unquestionably she could have dictated many scenes with equal spirit. We have seen Vanbrugh attempting to turn the debts incurred by the building of Blenheim on the Duke; we now learn, for the first time, that the Duchess, with equal aptitude, contrived a counterplot to turn the debts on Vanbrugh.

"I have the misfortune of losing, for I now see little hopes of ever getting it, near 2,000*l.* due to me for many years' service, plague and trouble, at Blenheim, which that wicked woman of 'Marlborough' is so far from paying me, that the Duke, being sued by some of the workmen for work done there, she has tried to turn the debt due to them upon me, for which I think she ought to be hanged."

In 1722, on occasion of the Duke's death, Vanbrugh gives an account to Tonson of the great wealth of the Marlboroughs, with a caustic touch at his illustrious victims.

"The Duke of Marlborough's treasure exceeds the most extravagant guess. The grand settlement, which it was expected her Grace had broken to pieces, stands good, and hands an immense wealth to Lord Godolphin and his successors. A round million has been moving about in loans on the land tax, &c. This the Treasury knew before he died, and this was exclusive of his 'land;' his 5,000*l.* a year upon the Post Office; his mortgages on many a distressed estate; his South Sea stock; his annuities, and which were not subscribed in, and besides what is in foreign banks; and yet this man could neither pay his workmen their bills, nor his architect his salary.

"He has given his widow (may a Scottish ensign get her!) 10,000*l.* a year to spoil Blenheim her own way; 12,000*l.* a year to keep herself clean and go to law; 2,000*l.* a year to Lord Rialton for present maintenance; and Lord Godolphin only 5,000*l.* a year jointure, if he outlives my lady: this last is a wretched article. The rest of the heap, for these are but snippings, goes to Lord Godolphin, and so on. She will have 40,000*l.* a year in present."

Atossa, as the quarrel heated and the plot thickened, with the maliciousness of Puck and the haughtiness of an Empress of Blenheim, invented the most cruel insult that ever architect endured!—so perfectly characteristic of that extraordinary woman. Vanbrugh went to Blenheim with his lady, in a company from Castle Howard, that other magnificent monument of his singular genius,

"We stayed two nights in Woodstock; but there was an order to the servants, *under her Grace's own hand, not to let me enter Blenheim!* and lest that should not mortify me enough, she having somehow learned that my wife was of the company, *sent an express the night before we came there, with orders that if she came with the Castle Howard ladies, the servants should not suffer her to see either house, gardens, or even to enter the park; so she was forced to sit all day long and keep me company at the inn!*"

This was a *coup de théâtre* in this joint comedy of Atossa and Vanbrugh! The architect of Blenheim, lifting his eyes

towards his own massive grandeur, exiled to a dull inn, and imprisoned with one who required rather to be consoled than capable of consoling the enraged architect.

In 1725, Atossa, still pursuing her hunted prey, had driven it to a spot where she flattered herself would enclose it with the security of a preservative. This produced the following explosion!

"I have been forced into chancery by that B. B. B. the Duchess of Marlborough, where she has got an injunction upon me by her friend the late good Chancellor (Earl of Macclesfield), who declared that I was never employed by the Duke, and therefore had no demand upon his estate for my services at Blenheim. Since my hands were thus tied up from trying by law to recover my arrear, I have prevailed with Sir Robert Walpole to help me in a scheme which I proposed to him, by which I got my money in spite of the hussy's teeth. My carrying this point enrages her much, and the more because it is of considerable weight in my small fortune, which she has heartily endeavoured so to destroy as to throw me into an English bastille, there to finish my days, as I began them, in a French one."

Plot for plot! and the superior claims of one of practised invention are vindicated! The writer, long accustomed to comedy-writing, has excelled the self-taught genius of Atossa. The "scheme" by which Vanbrugh's fertile invention, aided by Sir Robert Walpole, finally circumvented the avaricious, the haughty and the capricious Atossa, remains untold, unless it is alluded to by the passage in Lord Orford's "Anecdotes of Painting," where he informs us that "the Duchess quarrelled with Sir John and went to law with him; but though he proved to be in the right, or rather because he proved to be in the right, she employed Sir Christopher Wren to build the house in St. James's Park."

I have to add a curious discovery respecting Vanbrugh himself, which explains a circumstance in his life not hitherto understood.

In all the biographies of Vanbrugh, from the time of Cibber's "Lives of the Poets," the early part of the life of this man of genius remains unknown. It is said he descended from an ancient family in *Cheshire*, which came originally from *France*, though by the name, which properly written would be *Van Brugh*, he would appear to be of *Dutch* extraction. A tale is universally repeated, that Sir John once visiting France in the prosecution of his architectural studies, while taking a survey of some fortifications, excited alarm and was carried to the Bastille; where, to deepen the interest of the story, he sketched a variety of comedies, which he must have communicated to the governor, who, whispering it doubtless as an affair of State to several of the noblesse, these admirers of "sketches of comedies"—English ones no doubt—procured the release of this English Molière. This tale is further confirmed by a very odd circumstance. Sir John built at Greenwich, on a spot still called "Vanbrugh's Fields," two whimsical houses; one on the side of Greenwich Park is still called the "Bastille House," built on its model, to commemorate this imprisonment.

Not a word of this detailed story is probably true! that the *Bastille* was an object which sometimes occupied the imagination of our architect, is probable; for, by the letter we have just quoted, we discover from himself the singular incident of Vanbrugh's having been *born in the Bastille*.

Desirous, probably, of concealing his alien origin, this circumstance cast his early days into obscurity. He felt that he was a Briton in all respects but that of his singular birth. The ancestor of Vanbrugh, who was of *Cheshire*, said to be of *French* extraction, though with a *Dutch* name, married Sir Dudley Carleton's daughter. We are told he had "political connections;" and one of his "political" tours had probably occasioned his confinement in that State dungeon, where his lady was delivered of her burthen of love. The odd fancy of building a "Bastille House" at Greenwich, a fortified prison, suggested to his first life-writer the fine romance; which must now be thrown aside among those literary fictions the French distinguish by the softening and yet impudent term of "*Anecdotes hazardées*," with which formerly Varillas and his imitators furnished their pages—lies which looked like facts!

#### STRENGTH OF STONE MASONRY.\*

THE universal custom in determining the ability of stone to resist pressure is to test the compressive resistance of small cubes. The results obtained by testing small specimens of stone are very useful in determining the relative strength of different kinds of stone, but such results are of no value in determining the ultimate strength of the same stone when built into a masonry structure. The strength of a mass of masonry depends on the strength of the stone, on the size of the blocks, on the accuracy of the dressing, on the proportion of headers to stretchers, and on the strength of the mortar. A variation

\* From a paper by Professor I. O. Baker, of Illinois, in *Stone*.



in any one of these items may greatly change the strength of the masonry.

The importance of the mortar as affecting the strength of masonry to resist direct compression is generally overlooked. The mortar acts as a cushion between the blocks of stone, and if it has insufficient strength it will squeeze out laterally and cause a tensile strain; therefore, weak mortar causes the stone to fail by tension instead of by compression. Stone is several times stronger to resist compression than tension, and hence, where great strength is required it is necessary that the mortar should be of the best.

No experiments have ever been made, for obvious reasons, upon the strength of stone masonry under the conditions actually occurring in masonry structures; but experiments made upon brick piers 12 inches square and from 2 to 10 feet high, laid in mortar composed of one volume Portland cement and two sand, show that the strength per square inch of the masonry is only about one-sixth of the strength of the brick. An increase of 50 per cent. in the strength of the brick produced no appreciable effect on the strength of the masonry; but the substitution of cement mortar (1 part Portland cement and 2 parts sand) for lime mortar (1 part lime and 3 parts sand), increased the strength of the masonry 70 per cent. The method of failure of these piers indicates that the mortar squeezed out of the joints and caused the brick to fail by tension. Since the mortar is the weakest element, the less mortar used the stronger the wall; therefore the thinner the joints and the larger the blocks, the stronger the masonry provided the surfaces of the stone do not come in contact.

It is generally stated that the working strain on stone masonry should not exceed one-twentieth to one-tenth of the strength of the stone; but it is clear, from the experiments on brick piers referred to above, that the strength of the masonry depends on the strength of the stone only in a remote degree.

In a general way, it may be said that the results obtained by testing small cubes may vary 50 per cent. from each other, or say 25 per cent. from the mean, owing to undetected differences in the material, cutting, and manner of applying the pressure; and also that stones crack at half of their ultimate crushing strength. Hence, when the greatest care possible is exercised in selecting and bedding the stone, the safe working strength of the stone alone should not be regarded as more than one-fourth to three-eighths of the ultimate strength. A further allowance, depending upon the kind of structure, the quality of mortar, the closeness of the joints, &c., should be made to secure safety. Experiments upon comparatively large specimens are but little help in deciding this question; the only way is to determine the load carried by actual structures. The following are the greatest loads carried by stone masonry that were discovered by an extended search through engineering literature.

Early builders used much more massive masonry, proportional to the load to be carried, than is customary at present. Experience and experiments have shown that such great strength is unnecessary. The load on the monolithic piers supporting the large churches in Europe does not exceed 30 tons per square foot (420 pounds per square inch), or about one-thirtieth of the ultimate strength of the stone alone. The stone-arch bridge of 140 feet span at Pont-y-tu-Prydd, over the Toff, in France, erected in 1750, is supposed to have a pressure of 20.7 tons per square foot (290 pounds per square inch) on hard limestone rubble masonry laid in lime mortar. A former bridge at the same place failed with 64 tons per square foot. Rennie subjected good hard limestone rubble in columns 4 feet square to 22 tons per square foot (300 pounds per square inch). The granite piers of the Saltash bridge (England) sustain a pressure of 9 tons per square foot (125 pounds per square inch).

The maximum pressure on the granite masonry of the Brooklyn Bridge is about 28½ tons per square foot (about 400 pounds per square inch); the maximum pressure on the limestone masonry is about 10 tons per square foot (125 pounds per square inch). The face stones ranged in cubical contents from 1½ to 5 cubic yards; the stones of the granite backing averaged about 1½ cubic yards, and of the limestone about 1½ cubic yards per pier. The mortar was 1 volume of Rosendale cement and 2 of sand. The stones were rough axed or pointed to ½-inch bed-joints, and ½-inch vertical face-joints. These towers are very fine examples of the mason's art.

The pressure on the limestone piers of the St. Louis Bridge was, before completion, 38 tons (527 pounds); after completion the pressure was 19 tons (273 pounds) on the piers, and 15 tons (198 pounds) on the abutments. The limestone masonry in the towers of the Niagara Suspension Bridge failed under 36 tons per square foot, and were taken down; however, the masonry was not executed.

At the South Street Bridge, Philadelphia, the pressure on the rubble masonry in the pneumatic piles is 15.7 tons per square foot (220 pounds) at the bottom, and 12 tons at the top; this is unusually heavy, but there are no signs of weakness. The maximum pressure on the rubble masonry and cement mortar of some of the large masonry dams is from 11 to 14

tons per square foot. The proposed Quaker Bridge dam, which is to impound water for New York City, and which is the largest in the world, is designed for a maximum pressure of 16 tons per square foot on massive rubble masonry in best hydraulic cement mortar.

#### GERMAN COMMERCIAL MUSEUMS.

THE British Consul, M. Oppenheimer (Frankfort), reporting upon the trade of Frankfort in the year 1887, notices changes for the better in several branches, but continued complaint of over-production. He says:—"Great care is taken by all German Chambers of Commerce to acquaint the German commercial world with everything connected with export trade; they are indefatigable in giving advice and hints how to make the most profit out of existing relations, and how to enter into new ones. The export museums existing in most of the principal cities of Germany, and which are looked upon with growing interest, greatly contribute to extend the intercourse with foreign countries. The Frankfort Export Museum, fitted up in the galleries of the New Exchange Buildings, principally serves to inform the manufacturers and merchants of this district regarding the mode of business in foreign parts, and to facilitate transactions with foreign consumers by exhibiting in all their various qualities the articles most current in transoceanic countries, stating the prices that were realised there, the mode of packing most in favour, the quantities sold, the local charges, the period for which credit is asked and allowed, and so on. Thus the German manufacturer is enabled to see whether he can compete in exporting these articles to foreign markets, and also to adapt his goods to the wants of the country to which they are intended to be exported. The other part of the collection, the Museum of Imports, is equally important. . . . An information office constitutes the third part of the museum. The aim of this office is to afford all possible information concerning foreign countries. It contains statistics of every description, technical and commercial periodicals, guides and directories, reports and custom tariffs not included in German trade records. Parties interested are thus afforded an opportunity of keeping themselves always promptly informed on the subject of imports and exports. The museum is under the patronage of the German Government, and constantly receives through the German consulates interesting articles and collections of samples. The export sample-rooms of this city answer a similar purpose. The object of this institution is to promote the export and shipping of German merchandise. It exhibits samples, designs, sketches, advertisements, showcards, price-lists, and so on, for industrial and other producers, giving the exact prices, measures, weights, and all the required details in German, French, and English. Similar institutions exist in Stuttgart, Berlin, Munich, Cologne, and other German cities.



#### The Revival of Architecture.

SIR,—It would naturally be expected that an academical Professor would take broad views upon architectural style, at least in his public utterances, whatever his private sympathies—which like every one else he must have—may be. Still more might it be expected that he would take care to be historically correct. Mr. George Aitchison publishes his views on the above subject in one of your contemporary journals, and it appears to me that the paper bristles with questionable statements. But to take only one: "The merits of Gothic are many—you may call it picturesque, quaint, original, wonderful, daring, mysterious, vigorous, sometimes even sublime." This is pretty good. The most ardent admirers of Gothic architecture could scarcely desire warmer acknowledgment. He, however, goes on: "But if beauty means perfect proportion, with perfect grace of form, to call it beautiful is to use language in the same loose way as people who call a tender leg of mutton beautiful." So, in his opinion, the style that he admits possessed all the above characteristics, yet, nevertheless, produced no example of the beautiful. Shades of Jocelyn de Coucy, Monterey, and De Braye preserve us! He continues: "It was mainly from the lack of this quality—the beautiful—that it perished at the touch of the Renaissance." That is, according to the learned and genial professor, Renaissance architecture possessed all the above qualities, and many more, and consequently was such a power in art that the older glories perished accordingly—the new splendours were all too much for them. I deny this *in toto*. Renaissance architecture had nothing to do with the perishing of Gothic architecture. The change of style had nothing to do with the superior characteristics or the greater beauty of one style or the other. Something much more



powerful was at work in those days than architecture, viz. the complete change of social, political, and religious institutions. In this change, the cataclysm of nations, the Freemasons who had covered the earth with such beautiful and magnificent structures perished with all their arts and science, which none were then acquainted with but themselves. A sacred secrecy was part of their system. For a time architecture suffered grievously, clothing itself in a mere jumble of ancient classical forms, destitute at once of the skill of the Gothic and the grace of the antique. It was a weak infant in those days—not the powerful giant the Professor would have us believe; and I make bold to say that so long as our professors are content with “imitative” architecture, it will be some time before a Renaissance of any merit will “reveal itself, like Satan, at the touch of Ithuriel’s spear.” Something less magical, but more powerful, will be required. Two things will be necessary before we can have “an epoch of perfect architecture”—a national architecture worthy of the name—(1) a period of comparative mental quiet, when many social, religious, and political questions which at present excite men’s minds shall have been settled; and (2) a higher educational status in the general public and in the profession. On these conditions great works are sure to appear. There will be men with adequate accomplishments and genius in architectural design and construction, and there will be a nation to appreciate and encourage their works. Then we shall have our architectural epoch; then, like Pallas springing fully armed from the brain of Zeus, architecture—mother of all the arts—will have ascended her throne, surrounded by works so perfect that no rude and harsh criticisms will be heard, but only, as in Greece of old, a song of universal praise.

Let me, however, for a moment return to earth, for the purpose of making one more quotation and comment. “Architecture only flourishes in architectural epochs. The question is whether we can accelerate or retard such an epoch.” The Professor gives a satisfactory answer to the first, viz., “We can fit ourselves for the epoch when it does come.” As he says nothing about the second, I will venture to answer it. We can, and we do, retard the healthy and vigorous progress—the life—of architecture by persistent imitation of past styles. The more exact the copy, the greater the credit. In doing this, we may be good archaeologists, but we are bad architects. We might assimilate and digest ideas, not bolt forms and details bodily that disagree with us.

In conclusion, I should like to ask the Professor what he thinks of the collapse which Greek architecture suffered no less than Gothic, although, I presume, it is for it, equally with Renaissance architecture, that he claims the possession of the beautiful. Yet it perished in the presence of a debased rival style.

CRITICUS.

#### A Royal College of Architecture.

SIR,—I had originally intended, after having contributed my iota, and helped to make those responsible take up the subject in earnest, to withdraw from the arena of controversy on this matter, so as to make room for more influential men. However, Mr. Fleming’s notice of my scheme last week calls for further explanation on my part. By the way, may I remark that there ought to be no “controversy” about so desirable and laudable a topic; rather let “discussion” be the watchword, and that in a “helping” and genuine spirit. Even as I welcomed Mr. Fleming’s remarks, so do I also trust he will not resent the following observations which are made in good faith.

1. The fact that I am studiously acquainted with the real state of provincial pupilage leads me to place great confidence in the necessity (or desirability) of my proposed scheme. Suffice it to say that I am not the only one who has felt the want of adequate resources such as my proposal would supply.

2. Since Mr. Fleming lays special stress upon the effort made by the A.A. some few months back, I feel obliged to attempt to dispel what appears to me the grandiose illusion surrounding it. I will first comment upon the letter of December 31 last, issued by the Architectural Association.

(a.) At that date, evidently, the executive body of the A.A. shared views much akin to mine, only (according to the letter) far more vague and far less reaching. The very vagueness, the want of assurance that a determined effort was about to be made, doubtless caused many business men to little heed what must have appeared to them a well-meaning attempt, but without backbone. Since every town, taken “all in all” proportionally, is much like another in respect to the question before us, I will say of Worcester that I would then (had I at the time been informed therefore)—yea, would now make—an attempt to form a society, into which I believe I could have enrolled eight architectural students, eleven carvers (all of whom I know to be fully lamenting the divorce of ornament from the architecture of the day), six or more builders’ apprentices, and I doubt not for one moment that “all” the local architects and master builders would willingly have co-operated and served as officers of this miniature society of close on forty members (seniors included.)

There is already in this city a dead-alive architectural society of aristocratic origin. But local personages would be far more likely drawn into active co-operation at the instance of a decree from the R.I.B.A. than from its *protégé*. The letter should have been more definite, more authoritative, and have emanated from the Royal Institute. In face of the heterogeneous nature of my ideal local society as above, might not the Institute of Master Builders and (if there be one) of Sculptors, the Academy Art School, &c., be persuaded to join in the undertaking? None will dispute the advantage to pupils, in either branch, of such contact and intercourse during their studies. Since, in my opinion, the A.A. letter did not command the attention it expected, therefore do I strongly decline Mr. Fleming’s adoption of the majority of those few replies he did receive as an ultimatum.

(b.) A word about the A.A. notes which accompanied the letter. First of all, I feel convinced that the “present professional journals” (especially *The Architect’s* art plates) do not leave room for the “natural” growth of those “Notes” as at present conducted. As explanation, let me refer to A.A. Notes, Vol. II. No. 10, January 1888, folio 190. Under heading of “A.A. Proceedings—Art: Masonry and Stone-cutting,” occurs a notice of some articles; whereas those are just the sort of treatises which would make the “Notes” what they ought to be—but which they are not—of real use, had only the articles appeared in the A.A. Notes! Taking apart those notices of interest only to the metropolitan members of the Association, you will find but half left of any value to provincial students. Furthermore, on folio 189: “The Ventilation of a Grievance” sadly exposes the inadequacy of the Association to provide even for London men; it is noteworthy how the editor of the A.A. Notes endorses the complaints of “Adelphi.”

Therefore, for the above reasons, I think that the attempt which Mr. Fleming desires to be final is really far from a determined one, and is but superficial. I do not say the promoters did not feel very eager; I know they must have felt so to attempt a task beyond them. Yet I do not think, in face of “The Ventilation of a Grievance,” that anyone will doubt the total inadequacy of the A.A. “evening classes” to provide for the advanced professional education of “British architects.” The other two private schools mentioned, besides being in London only, and not under R.I.B.A. authority and protection (being private businesses), are expensive to the student. My society would not be so.

Lastly, different circumstances require different treatment. Medical men practise far differently to architects, and therefore require a different method of education; it is, therefore, unfair to compare them with us. The professions of architecture and the law are learnt under the system of pupilage, and seem likely to be for a considerable time; but while the architectural student is entirely unprovided for (at least in Worcester), yet the law student can obtain the most expensive books he wants from the local Law Society’s splendid library, and, moreover, his seniors go to the pains of organising mock trials for his practice, and the county courts are placed at his disposal therefor. All these occur in this city, and all for the law student. Where are we? In my scheme it is proposed to provide for the architectural student just what the law student has enjoyed for many years past. Is this too much to ask for?

Sincerely believing that it is not, and regretting those remarks which drew forth this present explanation, I remain, yours trustfully,

FRÉDÉRIC E. THOMASSON.

Worcester: June 11, 1888.

#### GENERAL.

A Loan Exhibition of Oil Paintings will be held in the Brighton Art Gallery during the autumn.

A Bas Relief was discovered in the excavations at the Acropolis of Athens on Tuesday. The subject is Minerva, who is seen leaning on a spear.

The Visitors to the Glasgow Exhibition up to Saturday last numbered 1,856,513.

Mr. Maunde Thompson was, on Saturday, appointed Chief Librarian of the British Museum, in succession to Dr. E. A. Bond.

A History of Wakefield Cathedral Church, by Mr. J. W. Walker, F.S.A., will shortly appear. The history of the fabric will be contributed by Mr. Micklethwaite, F.S.A.

The Church at Colwyn Bay, designed by Messrs. Douglas & Fordham, was consecrated on last Friday.

The Leeds Town Council, at a special meeting on Monday, decided to make an offer of 66,000*l.* to the trustees of the Coloured Cloth Hall Estate, and an offer of 28,000*l.* for the adjacent Quebec Estate, the purchases to be completed on the condition that both offers are accepted.

CRIMINAL PROCEEDINGS, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years’ imprisonment.

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A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, JULY 20, 1888.

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### TENDERS ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

### CONTRACTS OPEN.

BIRKENHEAD.—July 25.—For Erection of Church in Park Road East. Mr. J. C. Ogle, Architect, 34A Hamilton Square, Birkenhead.

BLACKPOOL.—July 27.—For Enlarging Covered Market in Lytham Street. Mr. J. Wolstenholme, Borough Surveyor, Chairman Markets Committee.

BRADFORD.—July 26.—For Building Gospel Hall. Mr. W. Rycroft, Architect, 10 Bank Buildings, Manchester Road, Bradford.

BRIMINGTON.—July 25.—For Building Board School for Infants. Mr. J. W. Fearn, Architect, Devonshire Street, Chesterfield.

EARLSHEATON (YORKS).—July 26.—For Erection of Two Houses. Mr. F. W. Ridgway, Architect, Dewsbury.

LIVERPOOL.—July 23.—For Building Cottages and Valve Houses in connection with the Waterworks. The Engineer, Municipal Offices, Liverpool.

LONDON.—July 20.—For Works at St. Luke's Vestry Hall. The Surveyor to the Vestry.

LONDON.—Aug. 1.—For Building Public Baths and Wash-houses for the Vestry of St. George, Hanover Square. Mr. F. J. Smith, Architect, 272 Winchester House, Old Broad Street, E.C.

LUDLOW.—July 31.—For Erection of Town Hall and Market Hall. Mr. H. A. Cheers, Architect, Twickenham.

LYMM.—July 28.—For Rebuilding Tower of Parish Church. Mr. Crowther, Architect, Hanging Bridge Chambers, Cathedral Yard, Manchester.

SOUTHEND.—July 24.—For Construction of Iron Piers. Messrs. Brunlees and McKerrow, 5 Victoria Street, Westminster.

TETBURY.—July 31.—For Building Passenger Station, Tetbury, and Additions to Kemble Junction Station. Mr. J. D. Higgins, Secretary, Paddington Station, W.

WHITEHAVEN.—Aug. 1.—For Erection of Vicarage and Stables at Drigg. Mr. T. Lewis Banks, F.R.I.B.A., Architect, 22 Lowther Street, Whitehaven.

WORKINGTON.—July 24.—For Pulling Down and Rebuilding Presbyterian Church. Mr. W. G. Scott, Architect, Victoria Buildings, Workington.

### TENDERS.

#### BEDFORD.

For Alterations to the Balloon Inn. Messrs. USHER & ANTHONY, Architects, Bedford.

Knight	£578	0	0
Haynes	564	0	0
Freshwater	557	0	0
Warton & Walker	530	0	0
FOSTER (accepted)	495	0	0

#### BELFAST.

For Construction of Outlet Sewers, Concrete Embankments, and other Works connected with the Tidal Lands Improvement, for the Corporation of Belfast. Mr. J. C. BRETLAND, Engineer.

Williams	£77,625	0	0
Gradwell	74,201	0	0
Buttler	68,289	0	0
Doherty	67,000	0	0
Nimick	59,610	0	0
Dixon & Co.	57,600	0	0
Best, Glasgow	49,165	0	0
Fitzpatrick	49,000	0	0
Thompson	48,769	0	0
Fulton	46,970	0	0
M'Crea & M'Farland	44,394	0	0
Best	43,035	0	0
H. & J. MARTIN, Ormeau Road, Belfast (accepted)	35,804	10	0

#### BIRMINGHAM.

For Providing and Fixing at Messrs. Lloyds, Barnetts, & Bosanquet's Bank in Colmore Row, Birmingham, a New Boiler and Furnace Fittings to the Hot-water Apparatus. Mr. J. A. CHATWIN, F.R.I.B.A., Architect, Birmingham.

HENRY HOPE, Birmingham (accepted).

For Providing and Fixing a New Hot-water Apparatus at the New Buildings at Winson Green Asylum. Messrs. MARTIN & CHAMBERLAIN, Architects.

HENRY HOPE, Birmingham (accepted).

For Providing and Fixing Three New Pairs of Cast-iron Gates, New Railing, &c., at St. James's Church, Ashted. Messrs. OSBORN & READING, Architects, Birmingham.

HENRY HOPE, Birmingham (accepted) £126 0 0

#### BRISTOL.

For Erection of Two Semi-detached Villa Residences, Claremont Road, Bishopston. Mr. COTTERELL, Architect.

Locke	£1,225	0	0
Lydford & Smith	1,184	0	0
Howard	1,175	0	0
Veals	1,131	0	0
Govett	1,090	0	0
FORSE (accepted)	1,020	0	0



**BUSKETT FLETCHWOOD.**

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For New Conservatory and Heating Apparatus for Mr. T. Quatremaine, Croydon. Mr. E. DOUGLAS HOYLAND, Architect, May's Hill, London.

HENRY HOPE, Birmingham (*accepted*).

**DUKINFIELD.**

For Building St. Luke's Church. Messrs. JOHN EATON & SONS, Architects. Quantities by Mr. H. E. Metcalf, Surveyor.

WM. STORRS, SONS & CO., Stalybridge (*accepted*) . . . £4,469 0 0

**EALING.**

For Building Stables, Fire-engine House, Mortuary, Foreman's Cottage, Librarian's House, &c., for the Ealing Local Board. Mr. CHAS. JONES, C.E., Architect. Quantities by Mr. Robt. E. Crossland.

T. Tilbury, Church Road, Willesden . . . £7,150 0 0

T. Linfield, 25 Coll's Road, Queen's Road, S.E. . . 6,918 0 0

W. J. Wells, Kingswood, Reigate . . . 6,181 0 0

W. Woodbridge, Maidenhead . . . 5,552 0 0

J. Horwood, Ealing . . . 5,236 0 0

F. Adamson, Ealing . . . 4,932 0 0

Scharien & Co., South Kensington . . . 4,931 0 0

Flew & Co., West Kensington . . . 4,900 0 0

J. Ball, Chiswick . . . 4,898 0 0

G. Stephenson, Bishopsgate Street . . . 4,862 0 0

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W. N. Waters, Ealing . . . 4,790 0 0

W. J. Samways, Ealing . . . 4,761 0 0

HUGH KNIGHT, Morden, Surrey (*accepted*) . . . 4,740 0 0

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George Green, Aylesbury . . . £265 0 0

William Muckleston, Leighton Buzzard . . . 158 10 0

G. Heley, Stewkley . . . 157 0 0

Tutt Brothers, Leighton Buzzard . . . 138 10 0

J. HARDWICK, Leighton Buzzard (*accepted*) . . . 95 0 0

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Grayston . . . 924 0 0

Girling . . . 870 0 0

Bennett . . . 850 0 0

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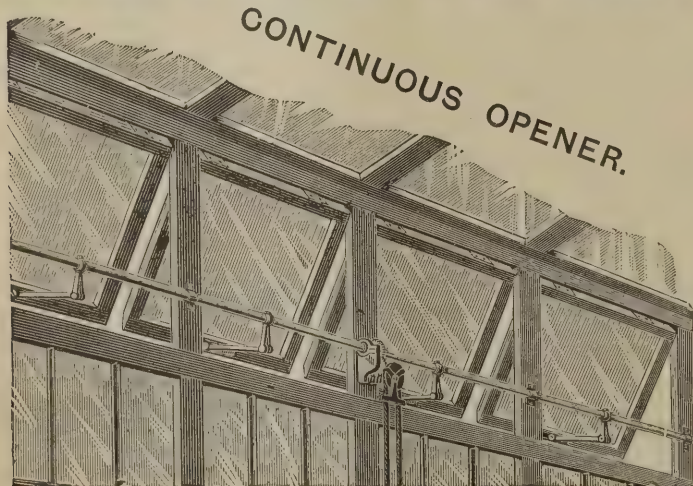
Douglas . . . 1,713 0 0

RICHARDSON (*accepted*) . . . 1,249 0 0

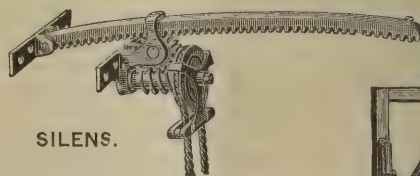
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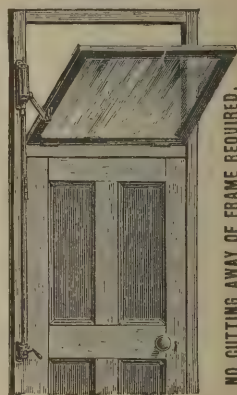
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W. Oldrey & Son . . . . .	1,463	0	0
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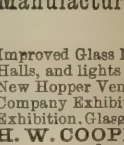
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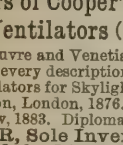
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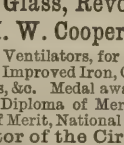
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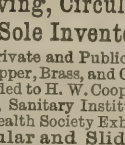
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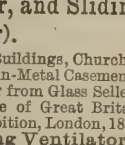
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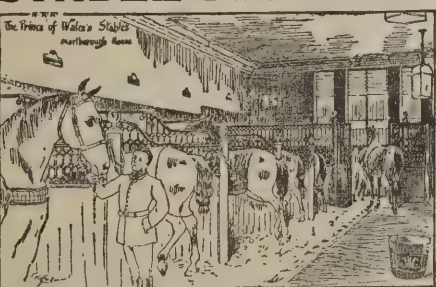
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## TRADE NOTES.

MR. F. C. KETTLE, auctioneer, of Tower Chambers, Moorgate Street, E.C., announces an important sale of freehold building land at Dovercourt, on the East Coast. The train service *via* Great Eastern Railway is the best on the East Coast, the trains running at frequent intervals during the day, and the fares are exceptionally low. The plots, eighty-two in number, will be put up for auction at three o'clock precisely, at the Cliff Hotel, Dovercourt, on Wednesday, July 25. For the convenience of intending purchasers a special train will leave Liverpool Street Station at 9.45 A.M., returning at 7 P.M. in the evening, the fares for which have been specially reduced, viz., first-class return, 5s.; second-class, 4s. The land is situated on the Marine Parade, Cliff, and other roads, and is within a few minutes' walk of the station. The estate offers exceptional opportunities to builders, marine villa residences being in great demand.

MR. M. TESTER has opened a dépôt for the sale of pneumatic and electric bells at 9 Bartlett's Buildings, Holborn Circus, E.C.

MR. E. H. SHORLAND, of Manchester and London, has recently supplied his Manchester grates and Manchester stoves, amongst other places, to the following post-offices:—Buckingham post-office, Amptill post-office, St. Leonards-on-Sea post-office, Guildford post-office, Southampton post-office.

THERE have recently been added two more artesian tube wells, 6 inches diameter, to the system of coupled tube wells in operation at the Aldershot Waterworks, to meet the additional requirements of the Government for the camp. These wells have each been completed by Messrs. Le Grand & Sutcliff, of

London, to the depth of 280 feet, in the short space of five weeks, manual labour only being employed.

A NEW gymnasium has been erected at Liverpool, and special attention has been paid to the ventilation. Messrs. Robert Boyle & Son's system is the one adopted, the extraction of the vitiated air being effected by the latest improved form of the self-acting air-pump ventilator.

THE York Town Council have resolved to carry out a scheme of sewage and public improvement for the city at a cost of 93,000*l*.

THE contract of Messrs. Mowlem & Co. has been accepted for the erection of the central, eastern, and western towers of the Imperial Institute, at a cost of 18,797*l*., making the amount of the total contract for the main buildings 161,597*l*.

On Tuesday the Pontefract Town Council decided on applying to the Local Government Board for powers to borrow 28,632*l*., in order to carry out a scheme for bringing water from Roall, near Whitley Bridge.

MESSRS. JOHN BOLDING & SONS, of the Grosvenor Works, South Molton Street, have issued a new edition of their catalogue, containing hundreds of illustrations of the latest developments of sanitary appliances. It is arranged in a form which will be found most convenient for use.

## THE MELBOURNE CENTENNIAL INTERNATIONAL EXHIBITION.

THE Centennial International Exhibition has become a much more imposing and ambitious undertaking than was at first contemplated. The demand for space has been much greater than was anticipated. The buildings have had to be considerably extended, and the moderate estimate of cost which was in the first instance given has been very much exceeded. According to the last estimate made by the treasurer, the expenditure up to July 31 will be about 216,949*l*., and the net cost of the Exhibition to the country will be about 100,000*l*. Owing to various circumstances, one of which is the additions that have had to be made to the buildings, the arrangements made by the executive commissioners have had to be somewhat modified. It was intended that all the buildings should be completed by April 30, which is the date at which the contract for the new annexes expires, but the date has now

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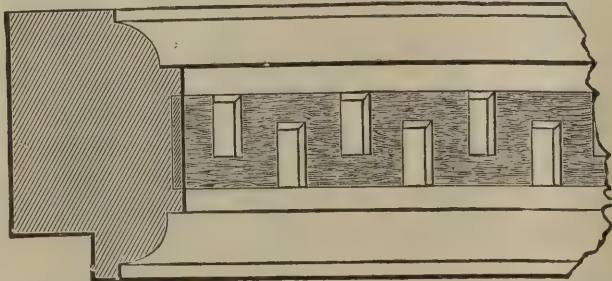
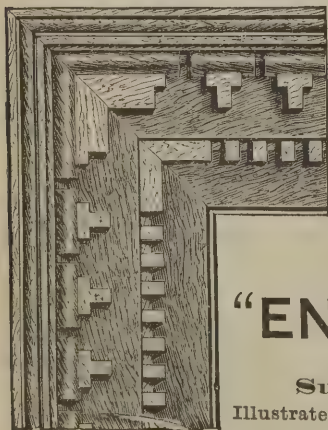
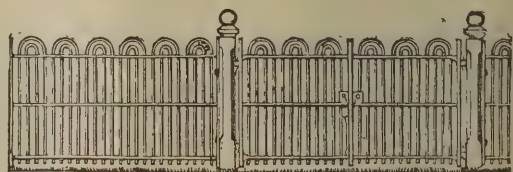
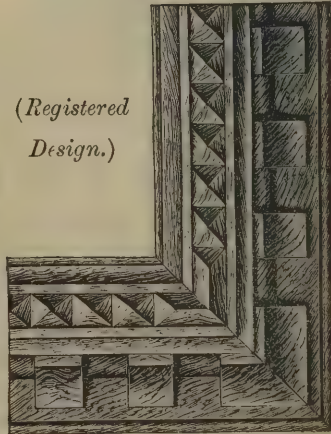
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been extended to June 30, and all that time will be required, as tenders for the construction of two additional annexes, covering  $3\frac{1}{2}$  acres of ground, have only just been let. Applications for space were to have been made not later than December 30 last, and all the space assigned was to be occupied by June 30. Applications for space have, however, continued to be received up to a very recent period, and the allotment of space cannot yet be completed, owing to the information required from countries with regard to machinery not having been received. Despite the many new difficulties that have arisen, the executive commissioners are confident that they will be in a position to open the Exhibition by August 1 next. The space covered by the buildings is very extensive, and the Exhibition will be the largest and by far the most important ever held, not only in Australia, but in any of the colonies of the British Empire. The main building and permanent machinery annexe cover 9 acres of ground. The main temporary annexes, as provided for in the original plan, occupied  $15\frac{1}{2}$  acres. A new bay was added on the south side, which gave a quarter of an acre, an extension of the French court added  $1\frac{1}{2}$  acre, the new northern annexe on the Rathdown Street side 1 acre, and the new eastern and western machinery annexes, for which a contract has just been let,  $3\frac{1}{2}$  acres. This gives a total of 31 acres, and with some additional space provided, the total area covered will be about 33 acres. The cost of the main annexes was 60,000*l.*, and the cost of the entire buildings is 114,000*l.*, so that here the treasurer's estimate of expenditure has been very much increased. The annexes, which are all constructed from the designs of Mr. G. R. Johnson, are built of wood, iron and glass. The new annexes form a series of arches, each of which has a span of 50 feet, and in the centre is a dome, which rises to a height of 165 feet from the ground. The ceilings of the central and eastern and western avenues are 50 feet high, and those of the annexes 35 feet high. The floor is level with that of the Exhibition building, and at the corner of Carlton Street and Nicholson Street it stands 22 feet from the ground. The noble proportions which the Exhibition has assumed will be best illustrated by a comparison. The Sydney Exhibition of 1879 covered about 15 acres; the Melbourne Exhibition of 1880, 22 acres; the Crystal Palace Exhibition of 1851, 20 acres; and the late Philadelphia Exhibition, 48½ acres. The recent exhibitions of London and Paris were of much greater magnitude, but it must be satisfactory to Australians to know that the Exhibition which is to celebrate the centenary of these colonies, in the area it covers,

approaches so nearly to that which was held in Philadelphia on the occasion of the centenary of the United States. The arrangements for the lighting of the building with electricity are well under way. The Australian Electric Light Company hold the contract for the Exhibition building and the main annexes, and they are following closely on the heels of the builders and the decorators. The installation is being carried out under the personal supervision of Mr. R. E. Fletcher, the company's electrical engineer. The systems adopted are the well-known Brush "arc" and Brush-Victoria incandescence systems. The Brush arc system has been extensively used at all the late English and Scottish Exhibitions, notably the Colonial and Indian, Edinburgh, Manchester and the Glasgow Exhibitions. All the arc-lighting of the Manchester Exhibition was on the Brush system, and over 500 lamps are being supplied to the Glasgow Exhibition. The lighting of the Melbourne Exhibition will, it is said, far exceed anything that has hitherto been attempted in this direction. The contract is for 825 "Brush" arc lamps, and 2,000 "Swan" incandescence lamps, with the necessary dynamo machines, conductors, fittings, &c. There will be 37 Brush dynamos, each capable of supplying electric currents to 23 Brush arc lamps, and 7 Brush-Victoria dynamos, each supplying current to 350 Swan incandescence lamps. Power for driving the machines will be supplied by six horizontal engines, coupled in pairs, each pair giving about 400 horse-power. Steam for these engines will be supplied from 12 boilers.

#### WORKPEOPLE'S PICNIC.

THE employés of Messrs. Jones & Willis, church furnishers and art workers in metal, wood, and stone, to the number of two hundred, and representing the various sections of their works in London and Birmingham, met at Oxford on Saturday, the 7th instant, for their annual picnic. After a round of visits to numerous colleges and public buildings, the party proceeded by steamer from Folly Bridge to the Isis Hotel at Iffley, where, after dinner, a cricket match between the two branches of the firm and a programme of sports were decided. The remainder of the day was occupied in other outdoor amusements, boating, quoits, &c., and after a most enjoyable time the party went back to Oxford, about one-half returning to London and the remainder to Birmingham.

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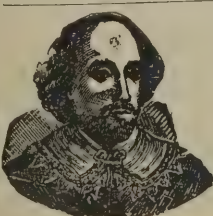
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## A CANAL LIFT.

AN engineering work of singular magnitude and importance has just been inaugurated at Arques, near St. Omer, in France. The undertaking so successfully inaugurated is the work of Mr. Edwin Clark, C.E., of Great Marlow, and an associate of Stephenson in the construction of the tubular bridge over the Menai Straits. The work comprises a canal lift, superseding the series of ordinary locks, which at present so seriously impede the traffic on the large canal system communicating with Belgium. The Continental canals are on a much larger scale than our own, the canal boats usually carrying from 210 to 230 tons. The ground at this particular spot rising very rapidly, there are five or six locks in close contiguity, involving great loss of time and great cost in their management. By this invention of Mr. Clark's the canal boats are now lifted the whole height of nearly fifty feet at one operation, occupying only a few minutes of time, and no loss whatever of water. This singular machine consists practically of a gigantic hydraulic press, whose piston is 3 feet 3 inches in diameter, and 50 feet in length, by means of which the boats themselves, actually afloat in an enormous tank or reservoir, are bodily raised or lowered, water and all, to the required height. This reservoir is in reality an actual length of the canal itself, made of wrought-iron plates, separated from the rest of the canal by iron gates, which are opened when it is raised into its proper position at the required height. There are two such presses, the one descending while the other is ascending, and they thus balance each other, and no steam engine or other mechanical power is required, although the weight lifted at each operation, including the water and the loaded barges, is very nearly 1,000 tons. Sixteen hundred barges have already been lifted prior to the public inauguration, the task being performed by a single man, whose only work is the opening and shutting of a small valve, and the operation only occupies a few minutes. A smaller lift on this principle was erected by Mr. Clark some years since in Cheshire, and was then patented, but he has just completed a still larger lift in Belgium, which will be opened during the present month. The introduction of this system will in future totally change the whole character of our canal systems, as a range of high hills may be thus easily traversed without any loss of water from the summit, and the same system is now being adopted in Canada for transporting sea-going vessels across the isthmus which intervenes between the Bay of Fundy and the Gulf of St. Lawrence.

## THE NATIONAL REGISTRATION OF PLUMBERS.

UNDER the presidency of the Mayor of Newcastle-on-Tyne, a largely attended public meeting was held on Monday in the Council Chamber "to consider the registration of qualified plumbers." Deputations, in most cases consisting of the mayor, medical officer of health, and town clerk, attended from the corporations of Jarrow, Gateshead, Sunderland, North and South Shields, Durham, Darlington, Stockton, the Hartlepoons, Tynemouth, Middlesbrough, Whitby, Carlisle, Whitehaven, Kendal, Blyth, and other places. Councillor Winter moved "That a District Council for Northumberland, Durham, Westmoreland, Cumberland, and North Yorks, be formed to carry out the system of registration for that district, and that the Council shall consist of master and operative plumbers and the public." Professor Garnett seconded the motion, and gave an account of the work done in technically educating plumbers, and said he was authorised by the masters and operatives of the district to express their approval of the registration system. The motion was unanimously carried.

## WATER-POWER IN THE UNITED STATES.

AN article on the statistics of water-power employed in the manufactories of the United States, by Professor Swain, appears in one of the recent publications of the American Statistical Association. In the course of it the Professor writes:—

It may safely be said that in no country in the world is there so large an amount of water-power employed as in the United States of America. The water-power of the country is not the least important of its natural resources, and its value is probably not realised properly. According to the returns of the Tenth Census, there were in use for manufacturing in the United States in 1880 55,404 water-wheels, using a total power of 1,225,379 horse-power, this being 35.93 per cent. of the total power employed in the country for manufacturing purposes. The value of water-power, like that of any other commodity, is governed by the law of supply and demand, and depends upon a multitude of circumstances; but inasmuch as water-power could not, in any part of the country, be replaced by steam-power at a less annual expense than about 20 dollars per net effective horse-power, it will certainly not be an exaggeration to assume that figure as the annual value of a horse-power.

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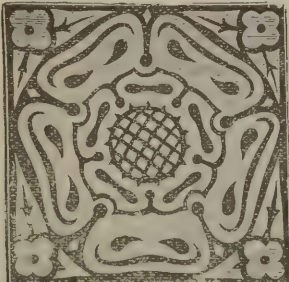
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On this basis the annual value of utilised water-power is about 24 million dollars. If it be desired to obtain some idea of the actual, not the annual, value of this power, the above amount may be capitalised at 5 per cent., giving the sum of, say, 500 million dollars. This, however, it must be remembered, represents only the value of the water-power already in actual use. The total theoretical power has been estimated, on the average throughout the year, at over 200 million horse-power.

The utilised water-power (1,225,379 horse-power) is considerably greater than the total amount of power (both steam and water) employed in the manufacture of cotton goods, woollen goods, foundry and machine-shop products, iron and steel, and paper combined. If this power were employed in hauling a train of cars on a level track at 30 miles an hour, the train would weigh about  $1\frac{1}{2}$  million tons, or, if made up of the heaviest loaded coal cars, would be about 165 miles long, while, if made up of Pullman coaches, it would be 500 miles long.

A comparison of the annual value of the water-power with that of the mines shows the following result:—Annual value of utilised water-power at 20 dollars per horse-power, 24,000,000 dollars. Value of pig-iron produced in 1885, 64,700,000 dollars. Coining value of silver produced in 1885, 51,600,000 dollars. Coining value of gold produced in 1885, 31,800,000 dollars. Value of coal mined in 1885, 159,000,000 dollars. Net earnings of all the railroads in the United States in 1885, 266,488,993 dollars.

It is thus seen that the water-power of the United States ranks among the most important "products" of the country.

The following is a statement of the main elements which are to be considered in examining the water-power of any region, and in estimating its value. That water-power will in general be the more valuable:—*a.* The greater the slope of the streams. *b.* The more nearly the fall of the streams is concentrated at definite points, the fall at each being neither too great nor too small for economical development. *c.* The more permanent the falls are, *i.e.*, the harder the rocks which cause them. *d.* The nearer the falls are to navigable waters, and the better the facilities are for transportation by rail. *e.* The larger the average flow of the streams. *f.* The more uniform the flow of the streams—that is, to enumerate the principal factors contributing to this result:—1. The more favourable the distribution of rainfall through the year. 2. The less severe the winters. 3. The more extensive the forests. 4. The larger the number and area of lakes or artificial reservoirs.

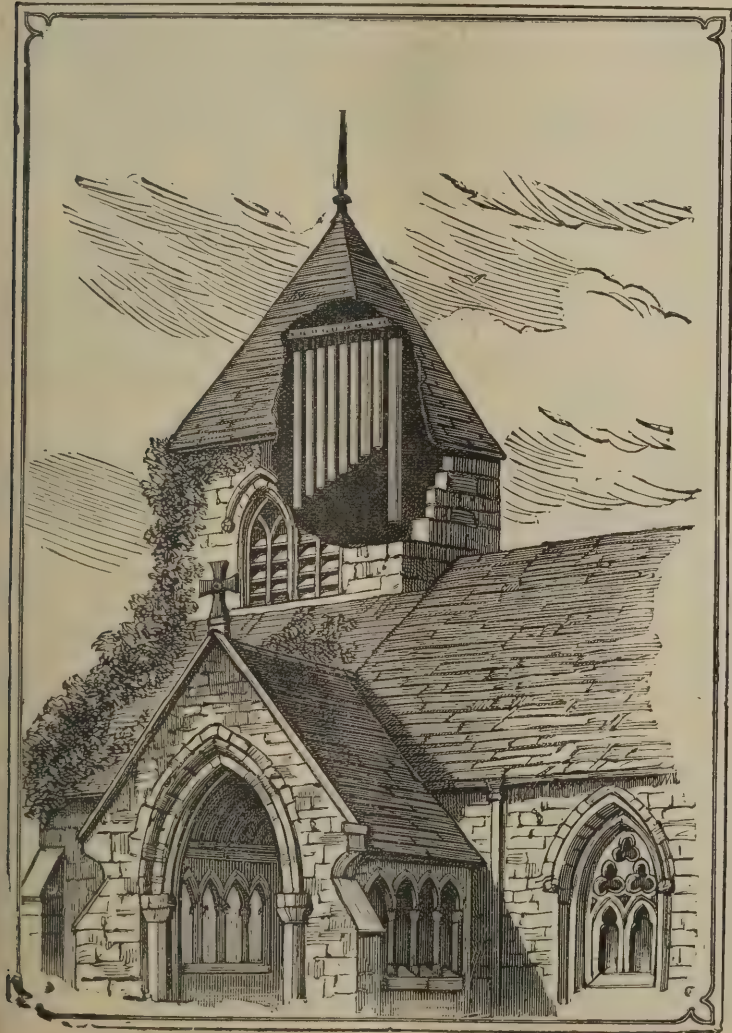
5. The less steep and rocky the drainage basin (within limits).
6. The larger the drainage basin.

Glancing over the country, and bearing these facts in mind, in New England almost the ideal condition of things is found; the streams have a large slope, with concentrated falls over the ledges of metamorphic rock, which underlie the entire region, the rainfall is favourably distributed, the forests are extensive, the lakes large and numerous, and the facilities for transportation excellent.

Passing westward and southward into the middle States, there is found a good water-power region drained by the streams flowing into Lake Ontario. The rainfall, though perceptibly smaller than in New England, is favourably distributed, being greatest in the summer and autumn, and the streams are well sustained in flow. The greatest power in the country, and probably in the world, occurs in this region—Niagara, with its total of over six million horse-power from lake to lake, or over five times the total utilised water-power of the country. Like the other falls in this vicinity, Niagara is gradually receding as the comparatively soft rocks are worn away by the mighty forces at work.

Throughout the remaining region of the middle States the facilities for water-power are not so good. The slopes of the streams are gradual, and abrupt falls are comparatively rare, owing partly to the topography and partly to the softer character of the rocks. The Susquehanna river, for example, though the largest stream on the Atlantic coast, offers not a single large utilised power and but few sites where power would be economically available, by reason of its great width at the places where falls occur. Going further south, a region of harder rocks, though not like those in New England, is met with, and the most striking difference, topographically, between the streams of the latter region and those south of the Hudson and Delaware is in the fact that, while in New England the falls are concentrated at distinct points, towards the south the slope of the streams, though not smaller, is nevertheless more uniform, and the falls occur generally in the form of long shoals, which, on account of the length of canal required, and the great width of the rivers at these places, would in general be difficult to develop. There are, of course, exceptions to this statement, and numerous places may be pointed out in the southern Atlantic States where concentrated falls occur precisely as in New England, but the above is a general statement of the case.

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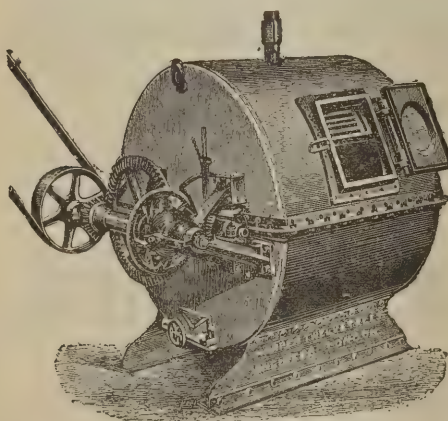
important industries, the largest proportion of water-power, 70·70 per cent., is found in the case of paper mills. These mills require large quantities of clear water for purposes of their manufacture, and would naturally be located on some stream, so that the larger proportion of water-power is easily explained. Again, of the total power used in flour and grist mills, about 61 per cent. is water-power. This finds its explanation in the fact that the majority of these mills are small, and for local use only. The raw material and the finished product are respectively produced and consumed in the immediate neighbourhood, and convenience of transportation enters little into the question, so that water-power, on account of its intrinsic cheapness, is preferred. In the manufacture of cotton and woollen goods one-half the total power is water-power, and in the case of worsted goods the proportion of water-power is still above the average for the entire country. On the other hand, the proportion of water-power employed in the manufacture of boots and shoes, and of iron and steel, is very insignificant. In the former case this is explained by the very small amount of power used per establishment, the small use of water for purposes of manufacture, and the almost forced location in certain places, and in the case of iron and steel, questions of location and ease of transportation explain the small proportion of water-power. In fact, if the proportion of water-power in the manufacture of iron and steel be compared with that in foundry and machine-shop products, where it is used in smaller and more local establishments, there is found a much larger proportion in the latter case.

#### BLASTING IN THE PEAK FOREST.

IN continuation of a series of blasting operations a big shot was fired at the limestone works of Messrs. T. Beswick & Sons, the Peak Forest, near Buxton, on Wednesday. Forty feet below the surface the rock was tunnelled a course of 81 feet turning both right and left, and in a chamber at the extremity two tons of powder was placed. The fuse was fired by Mrs. Beswick, and the explosion, watched by hundreds of people who lined the hill sides, occurred in eighteen minutes. The rock lifted in the centre like a huge cone, and then fell in a broken heap almost ready for trucking. It is estimated that 50,000 tons was quarried, the experiment being in every way successful. At a luncheon, to which distinguished guests were invited, Professor Sheldon proposed "The Lime Trade."

#### THE MANCHESTER SHIP CANAL.

ALL along the route of the Manchester Ship Canal the work of excavation is now being carried on, says the *Manchester Guardian*, at high pressure. The engineer has obtained possession of the land formerly used as a sewage farm by the Barton Rural Sanitary Authority, and now has practically complete possession of the whole of the land necessary for the completion of the works between Eastham and Manchester. It is expected that no difficulty will arise to prevent possession being obtained of the small quantity of land that has as yet not been formally yielded up by its former owners. The opposition threatened from Stretford will probably be no more heard of, and the land required from Sir Humphrey de Trafford for the dock, on the Stretford side of the river, has been purchased. It is anticipated that the Ship Canal (No. 2) Bill will be passed with very slight delay; and work on the site of the Manchester and Salford docks will soon be in full swing. The contractor's railway from Eastham to the river Weaver has been completed, and there will also shortly be a continuous line from the Manchester docks to Runcorn. The task of diverting the various railways which cross the line of the canal near Warrington has just been commenced, and the land required in order to carry out the diversion of the river Mersey across the Arpley Meadows, preparatory to commencing the dock works there, has been purchased. Although to some slight extent the weather recently has interfered with the operations of the contractor, the progress made has been exceedingly satisfactory, and the work done is quite up to, if not beyond, the amount estimated to be finished by this time in order to have the works completed within the stipulated period. The contractor is making arrangements for the addition of a large quantity of new plant, and on several sections of the canal work is being carried on both by night and by day. The operations on the Eccles and Barton sections are being pushed on with great vigour. At Stickings Island the required depth has almost been reached. An American "navy" has also arrived at this point, but it is not yet fitted up. A large bed of rock of considerable thickness has been encountered, and men are now engaged boring holes preparatory to blasting. At Salt Eye the American "navy" has made considerable progress, a depth of 20 feet having been reached. Large embankments, which run in a parallel line from the works near Roch House through the meadows to Flixton, are being made. At Barton



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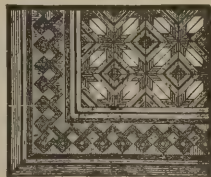
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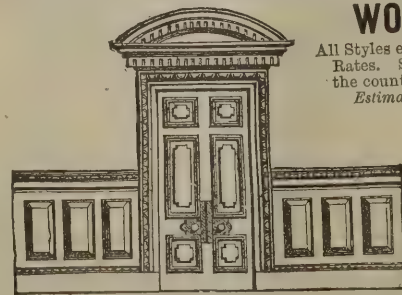
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blasting operations are in full swing, men being engaged shaping the blocks of rock for future use in the constructive works, and also to form the new entrance to Trafford Park, now in course of formation, from Dimplington Lane, Barton, through the fields, over the canal, and into the park. Preparations are being made for the erection of a wooden bridge to span the river between Stickings Island and Hulme's Bridge, and the erection of a second bridge over the river between Hulme's Bridge and Calamanka Locks will make the works one continuous length from Barton to Manchester.

#### TECHNICAL EDUCATION.

THE following remarks on technical education, from the hygienic point of view, appear in the *Lancet*, and have special interest at the present time :—

On any question relating to industrial development Lord Armstrong writes with an authority second to none, and it is therefore with great satisfaction that we find him reiterating and enforcing the views which we ourselves recently put forward upon the subject of technical education. We then spoke of the importance of developing the faculties of the child by this means, and pointed out that something quite different from a mere anticipated apprenticeship was required, both from an economical and a hygienic point of view. Looking at the same problem from the standpoint of a large and enlightened employer of labour, Lord Armstrong discerned the same features in the case. He deprecates any attempt to teach trades to school children, knowing full well that this can better be done when they come in riper adolescence to enter the factories and workshops where actual work is being carried on. But he also points out how great is the advantage to the grown man or woman of coming into possession, when mature age is reached, of mobile and manageable fingers and of trained eyes and ears. Knowledge, as distinct from the faculty of acquiring it, he estimates at a comparatively low value, since the knowledge that can be imparted to a child is necessarily of a somewhat vague description, and in most cases not such as will prove to be of any use to him in after-life. And this must be admitted to be in a large measure true. Orthography is of much less importance to a stonemason than a knowledge of the structure of stone, or to a bricklayer than the use of the plumb line. But

the answer to such an objection to the ordinary curriculum of our elementary schools is that the special knowledge of one trade is even more completely useless to the craftsman of another than is the general knowledge which has of late been so unsparingly denounced as "bookish." Nothing would be gained by substituting the study of chemistry for the study of grammar in ninety-nine cases out of a hundred, and something would in every case be lost. We doubt, therefore, if it is necessary, or even wise, to depreciate the studies to which by our present system the attention of children is chiefly directed, but we heartily concur in the opinion, expressed both by Professor Huxley and Lord Armstrong, that the present system is insufficient, and does not adequately develop the faculties of the young. We think, further, that they have very wisely fixed upon drawing as a subject of study eminently fitted to train both eye and hand, and one to which, therefore, a much more important position might with great advantage be assigned than it at present occupies.

#### WATER-GAS.

A DESCRIPTION of an important step which has been taken by the Leeds Forge Company towards the introduction of what is called water-gas is given in the *Yorkshire Post*. This is to some extent misnamed, as it is not manufactured solely from water, but from water and ordinary carbonaceous fuel. It has long been known that if steam is forced over a sufficient quantity of red-hot carbon in the form of coke or charcoal, an action takes place which results in the production of a mixture in equal volumes of two inflammable gases—hydrogen and carbonic oxide. The water is decomposed, and its oxygen unites with the carbon. This has now developed into a manufacturing process, which bids fair to revolutionise the gas industry. Commercial water-gas is made by blowing air and steam alternately through a considerable depth of fuel. The air-blast is maintained until the mass is vividly incandescent, and meanwhile the escaping vapours are led away to be burned in the works like the gases which are collected from the top of a blast-furnace. As soon as the mass is hot enough steam is substituted for air, and the water-gas produced by its passage through the hot fuel is deflected by a valve into a gasometer. When the temperature has fallen considerably the air is admitted again, so that there is a continuous alternation of

AT REST.



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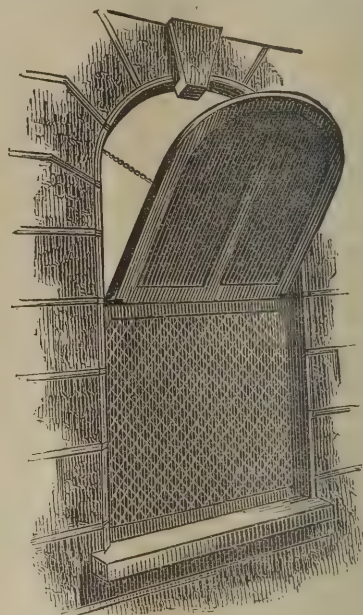


action. In this way a ton of the commonest and cheapest coal can be made to produce about 35,000 cubic feet of water-gas and 140,000 feet of the so-called generator gas. Compared with these results the Leeds Gasworks produce from 1 ton of coal 10,000 feet of coal-gas and between 13 cwt. and 14 cwt. of coke. For some time back water-gas has been in considerable use upon the Continent, being employed for all sorts of purposes for which we use the common coal-gas. By itself it is no use as an illuminant. The flame of hydrogen is hardly visible, and the carbonic oxide burns with a pale-blue light. Either the gas must be carburetted by adding to it the vapours of some volatile substance, or an infusible object must be introduced into the flame after the fashion familiar to every one in the lime-light. Water-gas has, however, two dangers about it from which our common household gas is comparatively free. First, it is inodorous, so that some strong-smelling vapour has to be added to it in order to make any escape of gas reveal itself; secondly, carbonic oxide is a strong and active poison.

## NEW CATALOGUES.

THE illustrated catalogue of Messrs. P. E. Chappuis & Co., 69 Fleet Street, E.C., deals with patent daylight reflectors of every description; also silvered glass, and silver-plated copper reflectors for gas and other artificial lights, of all which they are the manufacturers. The quality of material and excellence of manufacture are guaranteed. The pre-eminence of the goods of this firm in the market must be acknowledged by the hall mark of public appreciation, accorded as seen in so much patronage—royal, state, public and private patronage—along with that of municipal and incorporated bodies, companies, institutions, &c. Ample information, however, can be found as regards this point in the nine concluding pages of the catalogue. Messrs. Chappuis & Co. were in 1887 appointed by royal warrant manufacturers to Her Majesty the Queen, and in 1884 were awarded a silver medal at the International Health Exhibition. The firm was established in 1851, and ever since the business has steadily increased. Over 50,000 of their daylight reflectors are now fixed in London alone. They are also in general use throughout Great Britain and Ireland, and have been extensively adopted in all the principal towns of Europe, and large numbers have been exported to India, Canada, Australia, New Zealand, Cape of Good Hope, United States, China, Japan, Brazil, and the Argentine Republic. The accom-

panying sketch shows very adequately the light-collecting power of the silver on glass reflectors with the illumination resulting. Messrs. Chappuis's patents consist of carefully selected and highly polished patent silvered corrugated surfaces, fitted into strongly made wooden frames, so constructed and painted as to resist the action of the atmosphere, and fixed by means of iron fittings and chains to existing windows, as shown in the sketch. Their utility is too well known to need any explanation. They are certainly indispensable in buildings where day-



light is obstructed, whether owing to the peculiar construction of the premises, the small dimensions of windows, the proximity of opposite walls, or other local causes. They can be easily adopted where there is either a grating, area, window, or skylight, and will effect a considerable saving in the cost of gas or oil, and conduce to the general health and comfort. For shop-fronts reflectors can be made ornamental, of mahogany, oak, or teak, or with glass backs, gold or colour lettering, &c.,

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free on application.

## TESTIMONIALS.

SIR.—I have much pleasure in testifying to the efficiency of  
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To Mr. Grundy.

From ARTHUR W. BLOMFIELD, M.A., Esq., Architect,  
28 Montagu Square, London, W.

Mr. Grundy, of Tyldesley, near Manchester, has carried out  
his plan of warming in several churches built under my  
direction, and in each case it answers remarkably well, and has  
given great satisfaction.

From Professor W. B. ROBERTSON, M.D., West Dulwich, S.E.,  
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DEAR MR. GRUNDY.—I value your apparatus very highly  
indeed. I regard it as the greatest comfort I have in this house.

From Rev. A. FERGUSON SMYLY, Dean of Derry, The Deanery,  
Derry, September 16, 1887.

DEAR SIR.—I cannot refuse to give you a few words of com-  
mendation as to the apparatus you supplied for heating Derry  
Cathedral. Not only is the air of the Cathedral quite pure and  
pleasant to those attending the services, as it must be from the  
fact that most of the air heated is taken from the outside, but I  
find the building itself is so much benefited, as formerly it was  
damp and smelt damp, but now it is very dry and free from any  
musty smell. I find that, although the Cathedral is now much  
larger, the cost of firing is much less.

To Mr. John Grundy, 30 Duncan Terrace, City Road, London.

From Hon. and Rev. G. G. C. TALBOT, M.A., Withington,  
Cheltenham.

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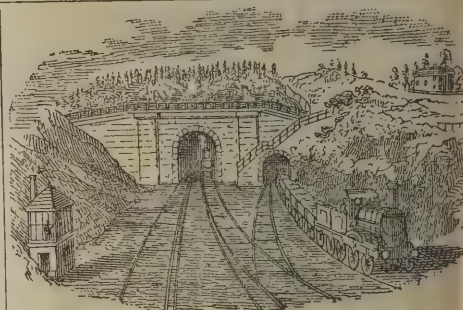
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thus answering the twofold purpose of lighting and advertising. The various qualities with particulars of price and other details, and also the different forms are explained, as well as the fittings, and attention has been paid to minor matters such as window tell-tales, reading-in-bed reflectors, &c. Besides the qualities enumerated in the list, Messrs. Chappuis manufacture the silver-plated copper reflectors, in quantities of not less than twenty. These are found preferable in many remote places abroad, or where there is a great danger of breakage (although a wire guard, fixed over ordinary glass reflectors, will protect them from any risk). The patent Myriastratic is manufactured specially to diffuse a soft light, and the staircase reflectors are so constructed as to break up and diffuse the light to the utmost extent; also counter reflectors for inside use.

## PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, Consulting Patent Agent, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

## APPLICATIONS FOR PATENTS.

9826. Isaac Kirkbride, for "Improvements in and relating to window fastenings." July 6, 1888.  
 9830. John Bell Millar, for "An improvement in the construction of spray baths." July 6, 1888.  
 9856. Borger With Munster, for "Improvements in window sashes and sash frames." (Complete specification.) July 6, 1888.  
 9905. Thomas Baiter and Joseph White, for "An improved device for opening and closing fan and skylights, the sashes of windows, and the like." July 7, 1888.  
 9930. John William Cawdary, for "A Carpenter's mortice gauge." July 9, 1888.  
 9962. William Samuel Cooper, for "Improvements in water-closet structures." July 9, 1888.  
 9985. Albert and William Hill, for "Improvements in furniture for window blinds." July 10, 1888.  
 10051. John Blanch Witt, for "An improved apparatus for raising or lowering the temperature in buildings and other confined spaces." (Complete specification.) July 10, 1888.

10066. Charles Darrah, for "Improvements in ventilators." July 11, 1888.

10009. Herbert William Hart, for "An improved construction or formation of brick for building purposes."

## PROVISIONAL SPECIFICATIONS ACCEPTED.

7419. Walter Stone and Henry Edward Turner (trading as Stone & Turner), for "Improvements in valves for cisterns, tanks, reservoirs, hoppers, drums, and like vessels." May 19, 1888.

8101. Milton Syer, for "An improved indicating door latch for lavatories, water-closets, offices, and the like." June 4, 1888.

8173. William Phillips and Christopher Tomlinson, for "An improved rebated weather bar." June 5, 1888.

8291. Arthur Geoffrey Haddock and Charles Henry Harvey, for "Improvements in the treatment of sewage and foul waters." June 6, 1888.

8334. Joseph Timothy Hopkinson, for "Improvements in and connected with fastenings and hinges for doors." June 7, 1888.

8515. Thomas Malvein, for "An improved gully-trap." June 14, 1888.

8676. Joseph Henry Goodwin, for "Improvements in apparatus for suspending and facilitating the raising of window-sashes, shutters, and the like." June 13, 1888.

8681. William Fisher and Charles Church, for "Improvements in devices for securing or holding windows." June 13, 1888.

8723. Manley Connell Ashwin, for "Improvements in the manufacture of bricks." June 14, 1888.

8850. George Ginn, for "An improved casement stay." June 16, 1888.

8991. John Wilson, for "Improvements in artists' portable easels." June 19, 1888.

9017. Thomas Ash and Richard Peacock, for "A window fastener." June 20, 1888.

9409. Josiah William Saunders, for "Improvements in sash fasteners." June 28, 1888.

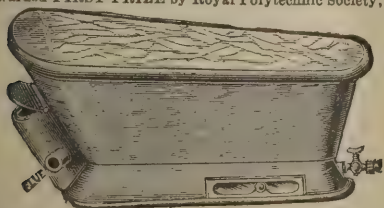
9480. Joseph Tollerton, for "Improvements in apparatus for the speedy application of gas to the wing lights, ground rows, and to the stages of theatres and public halls generally." June 29, 1888.

9615. George Henry Rayner, for "Improvements in mounting incandescent electric lamps." July 2, 1888. (Jules Rayonet, Paris.)

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PATTERN BOOKS ON APPLICATION.



## COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of this journal, give notice at the Patent Office in the prescribed form of such opposition.

12141. George Kelley, for "Improvements in locks and latches." Sept. 8, 1887.

12197. James Bazeley Petter, for "Improvements in the construction of theatres, public buildings, and other places of entertainment, for the prevention of fatal results from fire." Sept. 9, 1887.

12328. Andrew Mellville, for "Improvements in fireproof curtains for theatres and other buildings." Sept. 12, 1887.

12264. Charles Mackay and Edward Vernon Bailey, of the firm of Bailey & Mackay, for "Improvements in securing or connecting knobs to doors and other articles." Sept. 10, 1887.

## PATENTS SEALED, JULY 13, 1888.

7990. John Imray, for "Improvements in incandescence gas burners." July 2, 1888.

8738. Samuel Reeve, for "Improvements in means or apparatus for use in effecting the warming and ventilating of apartments and other places." June 17, 1887.

8893. Edwin Tudor Owens, for "An improved device for operating fanlights, skylights, ventilators, and other similar movable parts of structures." June 22, 1887.

9298. Charles Showell, for "Improvements in brackets for supporting roller ends, and for other similar purposes." June 30, 1887.

9535. Thos. Smith, for "Excavating apparatus." July 6, 1887.

10244. John Samuel Rigby, for "Improvements in the manufacture of cement." July 22, 1887.

14720. William Henry St. Aubin, for "Improvements in rack pulleys for window-blind cords." Oct. 29, 1887.

4632. Henry Atkinson Caulkwell, for "Improvements in the manufacture of tiles." March 26, 1888.

4711. Henry Harris Lake, for "Improvements in and relating to lavatory basins." (Thomas Charles Boyd and James Joseph Wade, United States.) March 27, 1888.

## ABRIDGMENTS OF SPECIFICATIONS RECENTLY PUBLISHED.

"Improvements in flush bolts." H. F. Bangert. No. 11265 (1887). The object of this invention is to provide a self-acting flush bolt for effectually securing folding doors of bookcases, &c., so that such doors may be automatically bolted

by the action of closing the door, and similarly unbolted when the doors are unlocked and opened.

*Claim.*—I.—In a flush bolt as applied to folding doors, the combination of a projecting pin attached to said bolt engaging with a corresponding inclined slot upon the edge of the opposite door, substantially as and for the purpose herein described and set forth.

"An improved parallel ruler." H. H. Lake. No. 11362 (1887). This invention has for its object the ruling in an easy and automatic manner of parallel and equi-distant lines. A small scale is attached for obtaining regular distances that separate the parallel lines to be drawn.

"Improvements in the manufacture of door and like bolts." E. Nightseales and J. Illingworth. 1316 (1888). This invention relates to improvements in the lugs of barrel, tower and other bolts, and consists in having the lug slotted so that when the bolt is turned with this groove or slot, after having been shot, it rests there securely, and cannot be shaken from its position by wind or other agency.

*Claim.*—Improved lugs for barrel, tower and similar bolts which prevent the bolts being moved after being placed in position (except at will), substantially as hereinbefore described and represented by the accompanying drawings.

"A new arrangement of toggle-jointed levers for imparting a double pressing motion for use in moulding and pressing bricks, briquettes, tiles, fuel blocks and other articles." T. C. Fawcett Whitehouse and J. D. Fawcett. 7305 (1888). This invention has reference to a prior patent granted to T. C. Fawcett, dated March 29, 1887, and numbered 4634.

*Claim.*—In toggle-jointed levers for imparting a double pressure, the combination therewith of a knuckle or link, whereby the said levers descend further during the second squeeze than during the first, all arranged and operated in manner substantially as herein described and illustrated.

"Improved roof tile." Syd. Turner. This tile is constructed so as to form a projection along the tile under the wing, forming a groove for a fillet of the adjacent tile to enter. This projection of triangular or other shape, when jammed under the fillet, locks, and is locked by the adjacent tiles.

*Claim.*—The formation of a projection (A) where shown on the drawing, and as above described.

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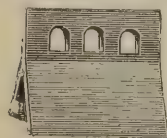
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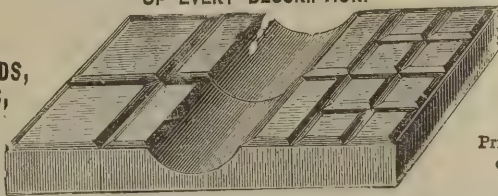
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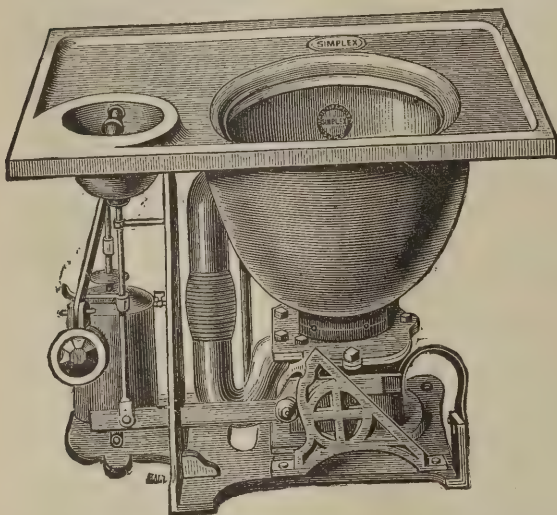


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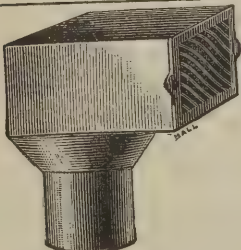
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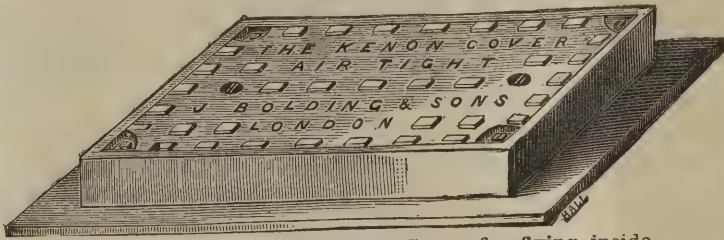


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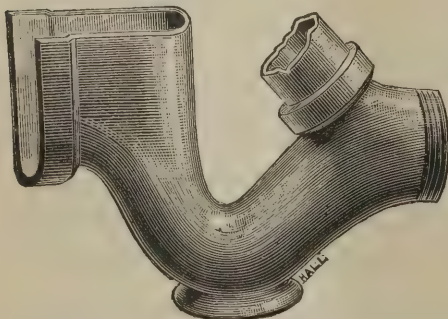
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# The Architect.

## THE WEEK.

It will soon be possible to decide about the real cause of the backwardness of the Wolverhampton Art School. Fourteen out of the seventeen members of the committee have resigned, because a majority of the Town Council decided against their proposals. According to the Art Committee, everything is owing to the head-master's inefficiency, which arises from his age. Indeed, one of the councillors reproached the master with his industry, as if it were a disgrace, and told him that he ought to be able to be independent of work. It was asserted that the master was not treated with civility by some of the members of the committee. We have before now spoken on the subject, and we must say we believe that Mr. GUNN has to suffer because he is not pleasing in the eyes of men who, apparently, suppose that a master of a school should be of a physique that would enable him to serve as a model of an APOLLO to the students. A good deal is made out of the circumstance of a young lady preferring a school in Birmingham, but are feminine whims to be the test of a school that was founded for teaching industrial art? It is plain from the heated discussion in the Council chamber that the unfortunate master is made a scapegoat. The school is starved; there are few casts, and the majority of them belong to Mr. GUNN. The building is badly lighted, and it would be odd if it were otherwise, for, according to the chairman, "the building was erected under the direct superintendence of a Science and Art Department inspector." Money is grudging, and the report that Birmingham receives 2,000*l.* in Government grants gives rise to the notion that a corresponding sum could be drawn by Wolverhampton. As most of the committee have retired, the master of the school will probably be less hampered than heretofore, and the Town Council will do well to act generously in supplying the deficiencies of the school. It is admitted that whatever taste may be in Wolverhampton is mainly owing to Mr. GUNN's efforts, and his dismissal from his office would be a strange way to express gratitude.

ON to-day, Friday, the decision will be given about the Prix de Rome for painting. The ten competitors completed their compositions, which have a common subject, viz., *Ulysses and Nausicaa*. With one exception, M. CHARPENTIER-BORIS, the candidates are less than thirty years of age, but none is under twenty-four. It is evident from this that all competitors must go through a long training before they are eligible to enter the "loges." Six of the artists are Parisians and one is from Sèvres in the suburbs. The three provincials are from Lille, Angoulême and Marmande. The ten competitors are MM. VERDIER, LENOIR, CHARPENTIER-BORIS, THYS, LAVALLEY, MARISSON, BUFFET, BOYÉ, ELIOT, VEBER. The three named last appear for the first time, the remainder having already competed without success.

SCOTLAND is so rich in granites, &c., it is only natural that stone alone should be deemed to be a suitable building material, and that brick should be despised as a make-shift. That a prejudice exists against brick and against tiles will be admitted by every one who is acquainted with the country. The Dean of Guild of Edinburgh is not proof against it. At the last sitting of the Court Sir JAMES GOWANS found fault with plans showing an alteration proposed in the Edinburgh Academy, because a wall was intended to be built in brick. The Court was, he said, opposed to the practice of using brick and stone that was creeping in, and which was destroying the old town. Sir JAMES said he could point to buildings in the city where the architects were going out of the way and spending more money by building in brick instead of in stone. So long as he was chairman he would set his face against the practice of disfiguring stone buildings by the introduction of brick. The applicants took the hint and their plans were then approved. In architecture, the question of a mixture of materials depends on the way they are used. The French,

whose buildings are allied to those in Scotland, and whose taste is not to be questioned, are not afraid of using brick with stone. Something of unity may be sacrificed for the sake of colour, especially when, as in Edinburgh, the uniformity of the stone is not seldom rather monotonous. A red brick building is so welcome a sight in a street of a Scottish town, it is no wonder that architects are eager to see even part of a building of that colour. Sir JAMES GOWANS may be right in the case he condemned, but it is to be hoped he will not exclude good brickwork from Edinburgh because stone is plentiful.

THE report which was read at the annual meeting of the Royal College of Music on Tuesday, stated that the Council had the gratification of reporting that there was every prospect that the inconveniences arising from insufficient accommodation in the college will be shortly removed, Mr. SAMSON FOX, of Leeds, having offered a munificent gift of 30,000*l.* for a new collegiate building on an appropriate site, to be determined by Her Majesty's Commissioners of 1851, who had granted a site for the new building on the South Kensington estate in Princes Gate. Mr. MUNDELLA described Mr. SAMSON FOX as a man of the people. Working from his early youth, and gifted with great natural talent as an inventor, he had raised himself to a position which enabled him to do a yeoman's services to his country, and having in the course of his arduous struggle upwards found in music his joy and his solace, he was now offering to the nation the advantages and the pleasures which he himself had derived from the cultivation of that beautiful art. It is an admirable way to express enthusiasm by erecting a new and handsome college for the accommodation of 400 students.

THE name of the late WILLIAM EDEN NESFIELD, architect, was introduced in the Probate Court on Monday. He died on March 25 at Brighton, leaving property worth about 25,000*l.*, a larger sum than many of Mr. NESFIELD's acquaintances would have anticipated as possible. In last August he made a will, by which Mrs. NESFIELD was to become universal legatee and devisee and sole executrix. But by a curious coincidence, in the August of the year preceding Mr. NESFIELD had also made a will in which Mr. H. W. NESFIELD, the brother of the architect, was declared to be the residuary legatee. The revoking of a former will is no easy matter, and Mr. NESFIELD accordingly opposed probate of the will of August in 1887, on the ground that his brother was not of sound mind, and therefore it was not duly executed. An action carried on under those circumstances would diminish the architect's savings, but happily the case was settled after it was opened in Court. As soon as Mr. NESFIELD was able to look through the documentary evidence, he concluded that he ought not to offer any opposition to the latest arrangements made by his brother in respect of property. Sir J. HANNEN accordingly pronounced for the last will, and each side will have to pay its own costs, which must be still a large sum.

M. ARBOIS DE JUBAINVILLE has started a new theory about the beautiful spiral bracelets and collars which are found in Ireland. In a paper which he read at the last meeting of the Académie des Inscriptions, he argued that they were used as a sort of money as well as for adornment. In the Museum at Saint-Germain there is a very heavy spiral bracelet of gold, and M. ARBOIS DE JUBAINVILLE has observed that one of the ends appears to have been cut, as if a length of gold of a certain thickness was recognised as having a definite value. In an Irish manuscript of the ninth century, he has found an account of a sale in which several golden ornaments are mentioned, and the weights of some are given. One of them exactly corresponds in weight with the bracelet in the Saint-Germain Museum. The conclusion drawn is that gold ornaments took the place of coins, as they formed a more convenient means of circulation than cattle. A rich man could thus have the gratification of adorning himself with his wealth, and it may have been wiser than to store the gold in a cellar. At any rate more artists were employed under the old system.



## BACK-TO-BACK HOUSES.

THERE are French writers like M. EDMOND SCHERER who look on England as the Holy Land of Liberty, as ground which visitors who have lived under Continental governments are bound to kiss on landing. In it every one can do as he or she likes without any restraints, which elsewhere surround people from their birth. Out of England, says M. SCHERER, civil life is enclosed in an invisible but insurmountable net of restrictions. But as the poet was tired with too much liberty, prosaic people may also occasionally feel that restraint is not without its use. The *laissez faire* policy is discovered to be suited only for an Utopian state, where the inhabitants think less of themselves than of their fellows.

The length to which individual license can run in one direction is seen in the report to the Local Government Board on "Back-to-Back Houses," by Dr. BARRY and Mr. GORDON SMITH. It must have been evident when houses of that class were devised that they were wanting in many of the conditions of habitations for human beings, and it might be supposed that some sort of authority would demand valid reasons for the departure from the common type of English cottage. What seems to have been paramount was the question of profit, and so long as a landlord was able to derive a return that he considered satisfactory, the inconvenience of the tenants was ignored. It might be supposed that English liberty could not exist without the application of the screw to the necessitous. The only advantage which back-to-back houses can be said to have is that they are a little cheaper than through houses. But even the smallest fraction becomes important in the eyes of the men who build them, and to insure it they are indifferent to the sufferings of the unfortunate people who are compelled to become their tenants. We find from the report before us that in Morley interest at the rate of 5*l.* 10*s.* 1*d.* is obtainable from investment in through houses, but the back-to-back yield 5*l.* 19*s.* 9*d.*, and the few shillings turn the scale, and in consequence 82 per cent. of the houses are on the more profitable plan. In Staniland the difference is between 4*l.* 19*s.* 4*d.* and 4*l.* 15*s.* 7*d.*, and the chance of obtaining the extra 3*s.* 9*d.* inspires the erection of 52 per cent. of back-to-back houses. In other towns, where there was an investigation, the profit was higher. Halifax shows 18*s.* 4*d.*, Todmorden 15*s.* 1*d.*, and Keighley 16*s.* 3*d.*; but as in Todmorden through houses pay 7*l.* 8*s.* 6*d.* per cent. and in Keighley 5*l.* 13*s.* 9*d.*, it is only a grasping spirit who would be dissatisfied with that rate of interest, and he must have inhumanity in him who would jeopardise the lives of people in order to gain less than one per cent. in addition.

For the risk of living in back-to-back houses seems to be as certain as any deduction in sanitary science. In Salford we are informed that "in certain streets and courts consisting of back-to-back houses, unfurnished with through ventilation, tubercular disease was much more common than in other parts of the same town, and that such disease occurred again and again in the same houses." Special inquiries in Salford by the authors of the report confirmed these conclusions, as "there was a progressive increase in the mortality from all causes and from each of the specified causes of deaths in direct proportion to the number of back-to-back houses." In Bradford, when an epidemic broke out, the Medical Officer of Health found that out of the 101 houses in which deaths had occurred ninety were of the back-to-back description. If returns were prepared in other towns with similar houses, we suppose the results would correspond with the foregoing.

That it is the absence of through ventilation owing to the planning of the houses which is the cause of the danger is evident. The construction of the houses in the Yorkshire towns described in the report is as sound as can be expected, considering the rent which is charged. We are informed that materials and work are good, so are the bricks, and the mortar is better than in some southern districts. When there are stone quarries in the neighbourhood the walls are frequently from 12 to 15 inches thick, the timber used is adequate, and, in fact, "there is no marked difference whatever between the character of the ordinary back-to-back house and the through house." Indeed it might be supposed that the quality of the work becomes a defect, and that if the walls were less closely

built and the woodwork had shrunk there would be more ventilation in the houses, and in proportion more safety for the occupiers.

Fortunately there is less real danger from fire in small houses than from an absence of ventilation, or it would go hard with the tenants. It appears that the regulations which are intended to keep fires from spreading, such as those which prescribe a thickness of 9 inches at least for party walls, the carrying up the wall a certain height, the avoidance of bond timbers in walls, &c., can be easily evaded in building back-to-back houses. How it is done is described in the report as follows:—

In the case of a row of through houses, every house, except the two end houses, will be concerned with two party walls and two external walls, but in the case of a row of back-to-back houses, each house, other than the four end ones, will be concerned with three party walls, and only one external wall. Hence, any saving that can be effected in the construction of the party walls of new buildings will produce a larger saving in the case of back-to-back houses than of through houses. This particular item of saving of cost has, we think, tended considerably to create the impression that back-to-back houses are cheaper of construction, and can therefore be let at lower rents than through houses affording the same amount of accommodation. There is accordingly a tendency in certain places to construct party walls only half a brick (4½ inches) in thickness, and to carry them up no higher than is absolutely necessary to separate the rooms in one house from the rooms in the next house, *i.e.*, up to the ceiling-joists of the top storey, so that in a row of houses the space in the roof above the ceilings of the top storey of the houses is continuous from one end of the row to the other. For similar reasons of economy the timbers of the several floors, and certain timbers of the roof, are frequently built into the party walls in such a way that the ends of joists and roof timbers, inserted on opposite sides of the same wall, are in close proximity to, if not in actual contact with, each other. Now a brick party wall only 4½ inches thick cannot be regarded as affording reasonable safety against the spread of fire, and still less can any party wall be so regarded if it be incomplete in height, or if it in any way allow the timbers of floors and roofs to be continuous from one house to the next. Nor, indeed, can such party walls be regarded as sufficient for purposes of health, since, owing to incompleteness, the atmosphere of one house would be common to the other houses in the same row, a condition which could scarcely fail to be a source of danger in the case of any infectious disease; and yet it is by no means uncommon to find the party walls in rows of houses incomplete, being stopped short at the ceiling-joists of the top storey, sometimes only 4½ inches thick, and very frequently with continuous timber through the party wall from one house to the next. Sometimes these arrangements are carried out notwithstanding their prohibition under the local by-laws.

It will be asked why the by-laws or other municipal regulations are not enforced in order to remedy the evils of back-to-back houses? One reason is that in many places there is a sort of conviction that dwellings of the kind are unavoidable, as they are believed to be the cheapest way of supplying a necessity that is largely felt. The humblest English workman or labourer likes to enjoy the satisfaction of having a house, and as a rule he is ignorant or indifferent about defects of sanitation. If speculators are forthcoming who will furnish all that a man of that kind cares for, and at what appears to be a reasonable rent, it is hardly to be expected that the authorities of a town will be too keen in their scrutiny of shortcomings, or illiberal in their interpretation of rules. The housing of the mass of the people is no easy problem, and there are times when any aid towards its solution will be welcome. No one will, therefore, be surprised on learning that in Halifax the requirements about the ventilation of back-to-back houses "are exceedingly meagre;" or that in Morley the clause about ventilation, although of pre-eminent importance, "appears to have hitherto remained a dead letter in the district;" or that in Todmorden the ventilation clause is totally neglected; and in Keighley is "rarely, if ever, carried into effect." The neglect of by-laws partly arises from the necessity to have many cheap houses, and partly, we suppose, from a recognition of the liberty of the individual, landlords and tenants.

There is another peculiarity of back-to-back houses of which the effects are explained at length in the report, but it is hardly a subject for notice in a journal. But when such items as the following are to be found in the tables, "Four privies for twelve houses in the space between the two blocks of six houses each, greatest distance 65 feet," and when in other places the distances are from 110 to 140 feet, the wonder is that the consequences are not more serious.

Mr. GORDON SMITH takes great pains to show how, by good management, through houses can be erected almost as



cheaply as back-to-back houses. Adopting the data supplied by the Borough Engineer of Halifax as a basis, he finds that the estimated cost of the erection of a through house and a back-to-back house corresponding in accommodation, and both complying with the conditions of the by-laws, would be 156*l.* 12*s.* 8*d.* for the former, and 152*l.* 1*s.* 8*d.* for the latter, and the difference in the value of the site would be only 9*s.*, or say 5*l.* altogether. The price demanded for land has much to do with the prevalence of back-to-back houses. On this subject the authors say:—

Taking a general view of the question, we find that the prices paid for land on which houses of the classes under consideration are built range from 4*l.* to 13*s.* 6*d.* per square yard, or at rates varying from 86*l.* 11*s.* 8*d.* to 3,267*l.* per acre. So far as our own observations have gone, it appears that back-to-back house construction is more prevalent in those districts where the price of land is highest. We have already shown that it is possible to erect through and back-to-back houses having fairly sufficient open space about them on what is virtually the same amount of land, but, in practice, the huddling of houses on area is possible and actually occurs to a much greater extent in the case of back-to-back than of through houses, and this too, in some places, even under the sanction of the local regulations. In the suburbs of certain towns visited, and in some of the open country districts, the land is practically in the hands of individuals from whom it is impossible to purchase any for the purpose of erecting artisans' dwellings at less rates than from 4*s.* 6*d.* to 10*s.* per square yard, or in other words, at the rate of from 1,089*l.* to 2,420*l.* per acre. These exorbitant rates, we are informed, are asked and obtained for land which has a present agricultural value of from 30*s.* to 40*s.* per acre annual rental, and in prosperous times has an annual value not exceeding 4*l.* per acre. Under such circumstances as the above it is hardly to be wondered at that there should be a tendency to crowd houses upon area.

As showing the density, it is found that in one part of Halifax there are from 214 to 282 persons per acre; in Morley the density rises to 285, and in Todmorden to 348. Landowners and building owners have reason to be ashamed of the figures.

The authors of the report recommend, as the general outcome of their inquiry, that the Local Government Board should refuse their sanction to any by-laws which would permit the erection of back-to-back houses, and that they should discourage by all the means at their command the erection of such houses. The proposal is the only way out of the difficulty, and probably the local authorities will gladly acquiesce in it. At present, as we have shown, local boards and town councils are expected to wink at evasions which are against general polity, and by laying down a hard-and-fast line the Local Government Board will put a stop to applications and concessions which bring misery to many people.

#### STAINED GLASS AND WOODWORK.\*

AMONGST the ancient Greeks and the Northern Italians of Renaissance days beauty was adored. Every man who practised a craft was as sure of fame if he followed what we now call a humble one as if he followed a noble one, provided that the articles he made could be endowed with beauty, and that he possessed a certain high degree of excellence. A carpenter, an armourer, a potter, a goldsmith, a lapidary, or a bronzist, was as certain to be famous as a sculptor, a statuary, a painter, or an architect. We naturally know less about the ancient Greeks than about the Italians, though, from Socrates being a sculptor, we hear something of the crafts, and we know that Phidias was not only a sculptor and statuary (and I use the word "statuary" in its proper sense as a worker in bronze), but worked also in ivory and gold. The great Italian artists were almost invariably craftsmen as well—in fact, had begun as craftsmen, and had learned during their apprenticeship precision in the use of tools, and in workmanship, as well as precision in drawing and modelling. As a rule, every youth who wanted to be a painter, sculptor, or architect, was apprenticed to a goldsmith. Brunelleschi, Michel Angelo, and Benvenuto Cellini were all brought up as goldsmiths; one became an architect, one a sculptor and painter, and one a statuary and die sinker; Ghirlandaio got his name from the golden wreaths he made; and Francia, as you may see in the National Gallery, signs his pictures as a goldsmith, while he signed his goldsmith's work as a painter, and, like the French artists of the present day, these artist-craftsmen were often excellent shots and swordsmen as well. One of the absurd things in the present day is the looking down on craftsmanship; a real craftsman can always do something well. If he can invest the article he works at with the highest form of beauty, he is just

as much an artist as he who paints a picture, models a statue, or designs a building.

The best definition of fine art I ever found is in Mr. Ruskin's lecture (second Oxford lecture, 1870):—"Every art being properly called 'fine' which demands the exercise of the full faculties of heart and intellect."

A finely-designed and finely-executed gem is just as capable of raising the loftier emotions as a bronze statue or a marble bas-relief; and, speaking personally, I should be inclined to place the glazier's art next to the divine arts of poetry and eloquence, for, like Timotheus's song, it has "raised a mortal to the skies."

To those who have the passion for colour that some have for music, beautiful coloured glass offers the same feast to the eye as exquisite music does to the ear, and from the fact of glass being transparent it does not appear like a tangible object, but, when lit by the sun, it looks like gems melted into light that bring all heaven before our eyes, and surrounding objects are suffused with its divine harmonies. I think I may say it is the only visual art in which man can emulate, if not excel, nature. In pure loveliness of many colours it exceeds in beauty the rainbow, or the sunset, and appears as if some divine affluence had come from heaven to entrance us. It defies the painter's brush and the poet's pen, though we cannot help feeling that Shelley was the poet most highly sensitive to the rapture produced by the glory of coloured light. In his description of fire he shows an appreciation of the beauty we meet with in stained glass, and did not merely use it as a foil to music:—

Men scarcely know how beautiful fire is,  
Each flame of it is as a precious stone  
Dissolved in ever-moving light, and this  
Belongs to each and all who gaze upon.  
(*The Witch of Atlas*, stanza 27.)

Milton's "storied windows richly dight" only give a flavour to his enjoyment of music:—

There let the pealing organ blow  
To the full-voiced quire below  
In service high and anthems clear,  
As may with sweetness through mine ear,  
Dissolve me into ecstasies,  
And bring all heaven before mine eyes.

The Poet Laureate uses it in the same way:—

And thunder-music, rolling, shake  
The prophets blazon'd on the panes.

This rapture is only produced by a few specimens of stained glass, mostly of the eleventh or twelfth centuries; though perhaps some of the windows of the cathedral at Florence are almost as lovely as those of Chartres, or the aisle windows of the choir at Canterbury. Next to them are some of the Saracen windows; these seem to have been copied in plaster from the pierced marble ones of Sta. Sophia, and from the fact of the substance of the window slabs being thick and the edges of the openings being splayed, you can infinitely vary the effect by moving into different positions. Some most love the suffused light on the splays, but to me the effect is most lovely when I get the bulk of this reflected colour with gleams of the glass through which the sun streams, making them look like different-coloured stars in a halo of glory. Next to these full-toned windows in loveliness are those of fine old grisaille glass, especially when seen towards sunset, and when exposure has converted each quarry of white glass into mother-of-pearl.

The cathedral of Poitiers has windows of grisaille, that I once saw just as the light was fading, and they made me ask myself if anything could be lovelier. After grisaille is some of that glazing which is only translucent, and has been done with onyx or marble, where one lovely pale tint fades into another, and then swells and fades again, "untwisting all the chains that tie the hidden soul of harmony." At San Miniato, Florence, the windows of the choir are glazed with slabs of pavonazetto, and look like glorified tortoise-shell. Besides the genius and labour of man, nature has lent her aid to produce these unsurpassable effects in old glass. She has, by roughening and eating into the surface of the glass, turned white into opal, and by partly overspreading them with dirt and lichen she has converted flat tints into cut jewels. Directly we get stained-glass windows whose forms and colours we can calmly criticise and admire, they fall into the ordinary category of beautiful human works, and to me are far lower in the scale than those that, when illumined by the sun, seem but a shapeless mass of coloured loveliness, which throw us into rapturous adoration, and seem as if they could not have been done by man, but that angels must have been sent from heaven to present us with them, so that we might be at once delighted and thankful.

When we attempt to copy the fine early stained glass, consisting of subjects to a small scale, we barely rise to respectable mediocrity. Supposing we have the old glass to copy from, the failure can only arise from one or more of these causes—want of skill, inferiority of material, or the effects of age. The

\* From the Third Cantor Lecture by Mr. G. Aitchison, A.R.A.



want of skill I cannot speak to, though it is to be supposed. The old glass was mostly done by monks, who devoted their time and genius in this direction as the best service they could render God, and who, consequently, considered that no time, no labour, and no care was too great to make their offering worthy. Such a sentiment we cannot find now and can barely understand. Perhaps I can throw some light on it by a story from "Greater Britain." It is acknowledged in America that no fruit growers can compare with the Shakers in the excellence of their fruit. The author asked one of them how they managed it; he said, "If you love the trees you study them, and you find out what they like and dislike; some like shade, some like sunshine, some like beautiful flowers, some like perfumes. If you make them happy, they give better fruit."

Next, as to material. Scandalous as it is to confess, we are grossly inferior in that, and knowingly so. Any manufacturer of coloured glass would tell you the fact in a moment; he would simply say, "It is not worth my while; make it worth my while and I will do it." And he might even add that, with all our chemical knowledge, and all our skill and appliances, he would undertake to make better glass than had ever been made before. I do not say he could, but he would thoroughly believe he could. Love and patient skill can achieve wonders. The earlier Indian gems were pierced only for a hair, and the instrument seems to have been a twig and some emery. And some of the most heavenly blues of early glass have never been equalled. Theophilus, a monk of the eleventh century, tells us that this blue glass was only to be got "in the ancient edifices of the pagans. Some small vases are also found . . . which the French . . . collect, and some melt the sapphire in their furnaces, adding to it a little clear and white glass, and make costly plates of sapphire, and very useful in windows."

The Romans certainly had not our chemical knowledge nor our appliances, but they may have had greater pride in their skill and greater skill.

The application of science tends to diminish skill, and the object of the manufacturer is to extinguish it. There is a trade proverb, that "No man can make his fortune who has to employ skilled labour." There are many other forms of coloured glass than the full-coloured; that in which the whole tone is light, and the variations in tone and tint are the slightest, is the most charming in effect, like those Italian low reliefs of the Quattrocentisti, where the highest part of the relief is not the eighth of an inch. There are, too, a thousand ways in which different sorts of coloured glass can be introduced to give beauty to windows of every description, and in every variety of building.

Glass, too, offers us a field for recording reminiscences of fine form as well as of fine colour; of form particularly when the window is placed where no direct sunlight comes on to it. Two or three things must always be considered when stained glass is used. You do not want highly-coloured painted decoration, nor that which is elaborately full of work, where deep-toned stained glass is used; this conjunction not only leaves no rest for the eye, but the colour of the dead painting is spoiled by the coloured rays. Nothing goes so well with the most magnificent full-toned stained glass as the greys of old stonework; next, you can no more leave a white window where the bulk are of fully coloured glass than you can put up a white chimney-piece in a room decorated in a full tone; and again, whatever be the tone of the chamber, if the wall decoration be full and elaborate, you only want enough work on the glass to suggest intention. You must not suggest want of completion, but merely the studied absence of ornament to give effect to the elaborated parts. Greek work is absolutely perfect in this respect; it says to you, "My author did not leave me plain for want of industry or skill, but because he considered by doing so he showed that highest skill of knowing when and where to stop." In the best Saracen work a similar effect is got—though, in my opinion, a lower one—by gradation. All is ornamented, but in the general effect the lighter ornament appears as mere texture, if not as a plain surface. The Saracen does not take so lofty an intellectual position as the Greek, for he either mistrusts his own judgment or yours; by going close enough you can see he has worked, while the Greek says, "Raise yourself to my standard, and you will then understand the value of this elaborate plainness."

There is one very comic belief that is applicable to stained glass, as it is to all the arts that combine the useful and the fine; persons who cannot draw on paper think they can on glass, or on pottery, or on silk, and persons who are more or less colour-blind think the same about colour. If foremen of house-painters are not chosen for this defect, their employers certainly look on it as a most pardonable weakness. I may add, too, that the art of drawing, modelling, or designing form, by no means confers the gift of colour on its possessor; many have this charming faculty of harmonising colour who cannot draw. In fact, the highest excellence in either, if not antagonistic to the other, is exclusive by predominance. The Tuscans were specially formists, while the Venetians were colourists. We should not go to Michel Angelo or Raphael

for colour, nor to Titian or Tintoret for form, though both schools are passable in the opposite gift. If a painter is not a colourist, he should change his occupation, for if the colour of his pictures is vile we do not look at them, while if the colour is superb we may at last study the form.

I think we may claim a new departure in stained glass, for some of Mr. Burne Jones's windows in Oxford Cathedral are both new in treatment and beautiful as well. In one of Mr. Ruskin's lectures he confirms the theories I ventured to uphold in my first lecture. In speaking of the windows at Chartres, he says:—"We profess that this is to honour the Deity, or, in other words, that it is pleasing to Him that we should delight our eyes with blue and golden colours. . . . I do not think it can be doubted that it is pleasing to Him when we do this, for He has Himself prepared for us, nearly every morning and evening, windows painted with divine art, in blue, and gold, and vermilion; windows lighted from within by the lustre of that Heaven which we may assume, at least with more certainty than any consecrated ground, to be one of His dwelling-places."—(Oxford lecture, p. 81.)

The arts of the carpenter and the potter are two of the oldest in the world. As soon as mankind wanted boiled food they had to invent something to boil it in, though probably the process was inverted, and when they got something that would stand heat and hold water, they took to boiling their food. Shells were doubtless used as the first drinking cups by those living by the seaboard, and calabashes by those inland, and we still find gourd-shaped bottles, with the double bulb, in the pottery of the East; the hafts of weapons and tools were probably the first specimens of the carpenters' art; then came the carved club and the javelin, subsequently the canoe, so aptly called by the Americans a "dug out," and the paddle. Framed huts of wood must have been a late invention, and doors and shutters a still later one.

Nature always makes her works fitted for their end, and when she likes, and she mostly does like, perfectly beautiful as well. So long as mankind were in constant contact with nature's works they tried to imitate her methods, but at last they discovered that this involved two processes. So that when they ceased to care for beauty they grudged the necessary labour to attain it. It is a million to one against a thing made by man, with no other end in view but utility, turning out beautiful.

Though ornamenting wood with incised or carved patterns was probably an early invention, it was no easy thing to mould it; hence the belief that the original Greek eaves of wood were first covered with ornamental terra-cotta, which was subsequently copied in stone. In speaking of woodwork, it is necessary to describe the material, and the way of putting it together. The thickest tree trunk is rarely wide enough to make a door of the centre plank, and even if it were, it is apt to crack and twist as it gets dry. To get over these difficulties boards enough were laid side by side, and fastened together by planks on the back at right angles, but this shows a series of parallel lines, either vertical or horizontal; the next step was to frame a thick skeleton, and fill in the open spaces with thinner pieces called panels. All that sort of woodwork that is called framed joinery practically comes to this, though some races have preferred putting all but the outside framework at acute angles; the best known specimens of this method are to be found in Saracen and Japanese work. The abrupt step from the plane of the frame to that of the panel was softened and beautified by moulding, and, except by different treatment of the width, thickness, and curvature of the mouldings, there is no way of bringing plain framed woodwork into the realm of art but by proportioning the panels and framework harmonically; we can then engrave or incise the whole or parts, or we can carve them into patterns or into figures. Wood has a small range of colours, white, yellow, red, brown, purple, and black, and a great variety of tones and tints in these colours, and we can still more vary the tints by oils, resins, and gums. Dragon's blood is much used for staining mahogany, rose, and other woods that are reddish by nature, or are wanted to be so, and is now known to be the resin from a palm, and was one of the Greek cinnabars, the other being vermilion; but Sir John Mandeville, in his "Travels in the East" (1322-56), gives an account of how they hunted the dragon for his blood. Few woods stain well except in small pieces, and when stained are mostly used for inlays. Woods are sometimes variegated, usually marked by stripes, veins, curls, or dapples. As the mind of man is greedy of novelty, we admire that to which we are unaccustomed, and often imitate a choice wood by painting a common one. In France they sometimes grain oak to imitate deal, while we grain deal to imitate oak.

Wood may be inlaid with other woods, with bone, ivory, tortoise-shell, mother-of-pearl, and other shells, with metals, with marbles, with precious stones, with glass, pottery, china or enamel, either plain or in patterns. Living as most of us do in hired houses, we hardly think of anything but painted deal, the painting being renewed every few years, according to the caprices of fashion. Modern inlaid woodwork most of us have never seen; what we take for it is marquetry—two veneers of



different colours cut into the pattern wanted, and one fitted into the other, and the whole glued on to a backing. Inlaying is sinking out the solid wood and letting in pieces of other coloured materials, and requires much greater care and skill than marquetry. There are said to be only five men in England who are first-rate at marquetry, and that most of them are foreigners. The main merit of real inlay is this—that at the worst the inlay can but come out, while veneer, if it gets damp, or if the glue gets too dry, comes off bodily. Very few people appreciate the value of hard wood, which has the incidental merit of not bruising so easily as soft; but its main merit is preserving the decorative colour originally designed, and that it can be inlaid, or if carved is not spoiled by successive painting. Oak is mostly our highest ambition; the Mediævals and the people of the last century were quite right to plaster and paint, or to gild it, for new oak is one of the vilest colours—a sort of cross between cold veal and a top-boot. If not French polished, it may get a decent colour in the days of our great-grandchildren, though when new it does not make a bad background for inlays of ebony, other coloured woods, and ivory. Spanish mahogany also looks well when it is about a century old, and is then a blackish purple. For dignity nothing is so serviceable as ebony, or wood stained black. Ebony varying from black, through brown to yellow, or through grey to black, has the inestimable advantage of variety, which dyed wood mostly wants. In this respect it is like real black marble, that is rarely without variations to grey or brown, and more often than not has white flecks or veins in it, so that you do not mistake it for enamelled iron or slate. The marquetry of floors may be equally well inlaid in patterns, only it wants to be done on a larger scale.

For the necessary woodwork of a building, exclusive of furniture, little turning is required, except for balusters. Turning is a cheap means of contrasting two or three simple forms, the square, octagon, &c., with the round, and getting harmonic proportions in the round; for the architect has to follow the example in the Eton Latin Grammar, "*Mutat quadrata rotundis*"—a great part of his art is in changing shapes from square to round. There is another method of enriching woodwork that I have omitted, and I hardly know where it originated or who carried it on—probably the Milanese; but you find abundant specimens at Venice, sometimes in doors, but oftener in picture and mirror frames, and in cabinets. The mouldings are mostly original, bold and striking, containing all the necessary variety of width, curvature, and projection; the mouldings are occasionally, and the flat surfaces are always, enriched by slight variations of surface that may almost be called textures, such as basketwork, minute beads (in the carpenter's sense) of various altitudes, often forming a meander; sometimes a sort of magnified pile is used, and the colour is nearly always black. These enrichments are still made here by colonies of foreigners in the back streets about Rathbone Place. Our manufacturers seize with avidity on the few patterns that are coarse, ugly, or vulgar; you can find plenty of them on expensive pianos. The Saracens, mostly inhabiting hot countries where both air and privacy are wanted, made great use of turned-wood lattice-work of an infinite variety of patterns where the close and the open were contrasted, not unfrequently containing texts from the Koran, and these again contrasted with the solid. The Chinese and Japanese, instead of ephemeral painting, use lacquer mostly of dark colour, from aventurine to black, and enrich it with gilding or colour, or with the low reliefs in gold-coloured lac; the metals, ivory, mother-of-pearl, and precious stones are often inlaid, and are frequently carved and raised above the surface. The Chinese and Japanese, having once been colourists, occasionally furnish us with old lacquer in low tones that is superb. Considering how the Japanese have taken us captive by their art, it is surprising that so little use has been made of late of their fine lacquered panels; but unless we can emulate the cheap broom seller, who stole his brooms ready made, we either have not wit or industry enough to avail ourselves of that which would give piquancy to our designs.

Mr. Ruskin is not complimentary to our age, for he speaks of it in his Oxford lecture as "An age without honest confidence enough in itself to carve a cherry stone with an original fancy, but with insolence enough to abolish the solar system, if it were allowed to meddle with it."

Some of the Chinese black lacquered ware, inlaid with gold and black mother-of-pearl, is as beautiful as Labrador spar, and I have seen black lacquered Indian cabinets of large size, inlaid with squares and patterns of black mother-of-pearl, that are more gorgeous in colour than anything but fine stained glass.

To some extent it is the duty, as well as the inclination, of a lecturer to find fault, when he is not a mere expounder of facts. We naturally do not need improvement if we are perfect, but if we are not perfect in those matters of which the lecturer treats he is not doing his duty if he does not find fault. Epictetus put this very well when he spoke of persons going to a physician. One has a fever, one an ulcer, one a dislocated

shoulder. If the physician merely dismisses them with soft words they are, at first, pleased; but each takes away the malady he brought. But if the physician be a good one, he gives nauseous physic to the one, cauterises the second, and puts the third to agony by setting his shoulder. I think persons in the present age lack the cultivation necessary to desire good workmanship and beauty, and consequently take their pleasure in lower and less ennobling ways than nature intended; but I do not think it extraordinary.

The savage who first tied a sharp stone in a cleft stick wanted to kill his enemies and secure his prey at once. As he got security, leisure, and affluence, he shaped his weapon and ornamented it.

Our acquisitions have been the use of steam, of electricity, and of iron, on a grand scale. The application of the former in the steam-engine is more than equivalent to the labour of millions, and has enabled us to partially annihilate time and space. The rush to yoke these dragons to our cars, and to gain wealth beyond the dreams of avarice, has made us blind to the necessity of noble leisure, of beauty for our enjoyment, and for the perpetuation of our name. Even now we are like Alexander, weeping for more worlds to conquer, when we have not yet conquered ourselves.

Many of the thoughtful are of opinion that the time is approaching when this wondrous application of science to the arts of life which has so completely revolutionised the world has nearly come to a close. If this be the case, and if we have not lost our energy, it will be exercised in again studying the beautiful in nature, in again beautifying what we have, and in perpetuating those evanescent beauties of our day, and those noble thoughts, actions, self-denials, and sufferings which are inseparable from humanity at great epochs of virtue.

If this be so, we may look to another golden age of the fine arts, which may, I hope, excel, and which I have no doubt will excel, those golden ages which have left some of their masterpieces for our instruction, admiration, and delight.

## TESSERÆ.

### Vandyke's Painting.

J. NORTHCOTE.

WHEN Richardson was a very young man, in the course of his practice he painted the portrait of a very old lady, who, in conversation at the time of her sitting to him, happened to mention that when she was a girl about sixteen years of age, she sat to Vandyke for her portrait. This immediately raised the curiosity of Richardson, who asked a hundred questions, many of them unimportant. However, the circumstance which seemed to him, as a painter, to be of the most consequence in the information he gained was this: she said she well remembered that at the time when she sat to Vandyke for her portrait, and saw his pictures in his gallery, they appeared to have a white and raw look in comparison with the mellow and rich hue which we now see in them, and which time alone must have given to them, adding much to their excellence. Of the truth of this anecdote I am well convinced from my own experience, as before I came to London I had seen no others of Sir Joshua's paintings than those which had been mellowed by a considerable space of time, which had given them a richness of hue, so that when I first saw his gallery in London I well recollect my surprise and disappointment at the sight of the raw, crude, fresh appearance of his new pictures, which, from these causes alone, seemed to me by no means equal to those I had before seen and so much admired.

### Vitruvian Canons.

E. AIKIN.

Of what nature were the systems of architecture of the Greeks is a question which naturally presses on our curiosity when we hear of the written works of a long list of architects, whose names alone survive in the works of Vitruvius. The authority of the last-mentioned author I am not inclined to rank very high, as his precepts are in general contradicted by extant remains; we may, however, conclude, from his manner of teaching the art, that the ancients proceeded on very different principles in the execution of the orders from the moderns. Thus Vitruvius directs us to vary the proportion of the members according to the magnitude, situation, purpose, and other circumstances of the building; while modern authors offer no rules of that kind, but prescribe a certain fixed modulation of the parts of each order, to be used in all edifices, however circumstanced, each author recommending such as his peculiar studies have occasioned to make a favourable impression on his mind. The columns of areostyle temples, says Vitruvius, are eight diameters in height; those of a diastyle intercolumniation, eight and a half; those of systyle, nine and a half; of pycnostyle, ten; and of eustyle, eight and a half; and these he directs without any modification for the different orders,



though in a subsequent part of the work each order has its particular proportions assigned. That the ancients were also guided by minute optical considerations is rendered probable by another passage respecting the diminution of columns, which is directed to be varied according to their altitude; thus, in a column of 15 feet high, the diameter at the bottom is to be divided into six parts, and five given to the diameter at the top; if the column is from 40 to 50 feet in height, the bottom diameter is to be divided into eight parts, and seven given to the top. Several intermediate proportions are mentioned, and if it is still higher, the same principle is to be observed. The reason assigned for this is, that as a greater height causes the column to appear more diminished, this appearance is to be corrected by an additional thickness, beauty being the province of the eye, which if not satisfied by the due proportion and augmentation of the members correcting apparent deficiencies with proper additions, the aspect will appear coarse and displeasing. The columns at the angles of the porticoes are also directed to be made one-fiftieth part of a diameter thicker than the others, because they being more surrounded by the air, will appear slenderer, and the deficiencies of the sight must be rectified by the judgment. This last practice is confirmed by the example of the Temple of Minerva at Athens. In another part, Vitruvius gives an extraordinary direction, for which it is not easy to conceive a reason; that the columns of the side porticoes of a temple should be so placed that the inner line of the shaft may be perpendicular, thus leaving all the diminution on the outside. This is observed in the Temple of Vesta at Tivoli, and perhaps in no other antique example.

#### The Theory of Structures.

W. J. M. RANKINE.

Strictly speaking, all machines are structures, though all structures are not machines; but it is convenient to limit the term structures to those combinations of solid materials whose parts are not intended to have relative motion, and which are thus to be distinguished from machines, whose parts are intended to have relative motion and to perform work. The theory of structures is founded on the principles of statics or the science of equilibrium. It is divided into two parts, relating respectively to the two requisites of a structure, stability and strength—stability being the power of resisting forces tending to overthrow the structure, or to derange the parts of which it is made from their proper relative positions; and strength, the power of resisting forces tending to alter the figures of those parts or to break them in pieces. For example, in a bridge stability requires certain relations to exist between the distribution of the load, the figure of the arch, and the dimensions of the abutments, in order to prevent the dislocation of the arch-stones or the overthrow of the abutments; and strength requires the arch to be of a thickness sufficient to resist the tendency to crush it. In applying the principles of stability and strength to structures, regard must be had to the special properties of the materials employed, whether earth, stone, bricks, cement, timber, iron, or other metals, as well as to the kind of workmanship to which each material is subjected and the forms in which it is used. The end to be aimed at in every scientifically designed structure is to adjust exactly the position, form, and size of the whole and of each part to the forces which it has to sustain. The more nearly this end is attained the better will the structure be, not only in efficiency, durability, and economy, but also in beauty. This, independently of ornament, is the fundamental principle of beauty in architecture as well as in engineering.

#### Defective Planning in London.

J. H. BRIDGES.

Let us compare some simple social states with others that are less simple. Let us look at a peasant proprietor in a French village, or at a healthy squatter far away among the gum-trees in Australia. The contrast between their life and that of the dwellers in large towns might, for many purposes, be summed up in two epithets borrowed from geometry (and you know modern mathematics are capable of explaining everything). It might be spoken of as the vertical state as opposed to the horizontal. Remark that to the colonist it is of comparatively little importance what his neighbour or the rest of the world do. His food comes to a great extent vertically upwards to him from the ground; water comes vertically downwards to him from the sky. His clothing, whether of wool, or flax, or skin, grows on the spot; his house is built from a quarry in his field, or from logs in his own bit of forest; the refuse from his house and person is buried in the soil, and so on. Contrast all this with the horizontality, so to speak, of town arrangements. Water is brought from reservoirs twenty or fifty miles away; food comes from farms miles distant, perhaps from the other side of the Atlantic, or from the other side of the Pacific; clothing from any part of Europe or Asia. As for refuse substances, no vertical removal of them is possible; complicated labyrinths

of tunnels, arterial systems, pumping-stations, sewage irrigations, Acts of Parliament, and what not, have to be instituted to prevent us from poisoning one another. Think again of all the horizontality implied in highways, railroads, and telegraphs. I would not strain my geometrical metaphor further than it will bear. Dwell on one more aspect of the same subject. Think how much historical phenomena have to do with the matter. For good or for evil, for good infinitely more than for evil, but yet for evil also, we have to bear the burden of the past. The treasures are mixed with dross. Take the single instance of house provision. A squatter in the bush can build his house where he likes, he has hill and vale to choose from; but a house commonly lasts longer than a man, and in towns we have to choose from the houses provided by other generations. Put yourself in the position of a workman who must live near his work. Think of the structure of London between Regent Street and the Tower—I speak of the courts, back streets, and lanes. They are much more interesting than the lanes of Venice; and then ask the question, How much of all this is due to the intolerably bad domestic government of England from the restoration of the Stuarts down to, let us say, the reign of Dr. Chadwick, thirty to forty years ago? Think how it would have been if London, after the Fire, could have been rebuilt under the eye of Cromwell, instead of the unholy brood who for a whole generation threw England to the dogs, and whose mere names, were it possible, we would forget! Then follow the growth of London into the next century by the light of Hogarth's pictures—take the one picture of *Cruelty*, for instance—and think how very little forethought might have changed the growth of St. Giles's, Bloomsbury, or St. Anne's, Soho. And then when, by reading, and also by ocular inspection, you have become familiar with the anatomy and physiology of a London court, including the embryology of it, that is, the way in which it arises, under the motive power of high rents, by the simple process of building rows of small houses at the end, and ultimately at the sides, of back gardens, the wind from each one of the four quarters of the sky hermetically shut out, and the ignorant greed of the builder uninterfered with by wisdom or by policemen of any sort or kind; then, I say, when the lesson has been well learnt, go to Hackney or to Stratford, where new London is ravaging the green fields rapidly, and ask how far is the next generation to be compromised by what the speculative builders are doing there at this moment? and compare the rate of velocity of their proceedings with that of Sir Sydney Waterlow's most admirable building society or of the Peabody Trustees.

#### The Theory of the Arch.

W. H. BARLOW.

The supposition of the existence of a certain curve or line, in which the pressure is transmitted throughout the voussoirs of an arch, is not of recent origin. The theory of equilibration, called the catenarian, of which an account is given by David Gregory ("Phil. Trans." 1697), is founded on this basis; but throughout the investigation it has been assumed necessary to make the line in which the pressure is transmitted coincide precisely with the form of the intrados of the arch, a condition which is necessary to stability only when the arch is infinitely thin. In the theory promulgated by La Hire and Attwood, familiarly known as the wedge theory, or that in which each voussoir is supposed to act as a wedge, it is considered necessary that the pressure should be transmitted, so that the direction in which it acts at each joint should be at right angles to the surface of contact, which condition is only necessary to stability when no friction exists between the surfaces of contact of the voussoirs. But when the thickness of the arch and the friction at the surfaces of contact of the voussoirs are both included in the investigation, it has been shown by Professor Moseley, in his able and elegant exposition on this subject, that the two conditions above mentioned become modified, and that in an arch of uncemented voussoirs the actual requirements to establish stability are:—First, that the line in which the pressure is transmitted (which he has named the line of resistance) should fall within the thickness of the arch at every joint; secondly, that the direction of the pressure at each joint should be within certain limits, depending on the friction of the materials employed. Coulomb, the first writer on this subject, who based his assumptions on data consistent with practice ("Mémoires des savans étrangers," 1773), considered, with Moseley, that there were two causes of rupture; the first arising from the turning over of certain parts of one voussoir on the edges of another; and the second from the slipping or sliding of the voussoirs on each other; and although the mode of investigation pursued was totally different, yet the results present a complete accordance with those since arrived at by Professor Moseley, so far as they embrace the same elements of discussion. This remark applies also to the catenarian and the wedge theories; for if the thickness of the arch be considered to be infinitely small, the line of resistance becomes the catenary, and if the



thickness be retained and the friction omitted, the line of resistance is analogous with the line of pressure as determined by Whewell in the wedge theory; but though the investigations of Moseley leave little to be done in elucidating the conditions of stability in arches mathematically, yet the deductions have not received that attention from engineers which their importance deserves, chiefly from the absence of any decided practical exhibition of their correctness and utility, and also from the investigation being surrounded by too much mathematical difficulty to admit of ready application. The analogy before-mentioned, as existing between the line of resistance, the catenary, and the line of pressure of the wedge theory, arises from one governing principle, which is general in these curves, and constitutes the essential element of equilibrium when the only force acting is gravity, namely, that the horizontal forces in any part of the curve are equal to each other—by which it must be understood that not only must the horizontal force at any part of the curve be opposed by a horizontal force of equal amount in the opposite direction, but that the horizontal force is equal throughout the curve. This essential element of any curve of equilibrium though probably known, has not been pointed out. Its mathematical correctness is self-evident, and it will be found that the limit of stability is when the point of contact of any two voussoirs falls at their outer or inner extremities, thus establishing practically that the line of resistance, or curve of equal horizontal thrust, must be contained within the thickness at every joint. The second condition necessary to stability, namely, that the direction of the pressure at each joint should be within the limiting angle of friction, is almost always of necessity fulfilled in the forms of arches, and with the materials usually employed in practice. This part of the inquiry will therefore be confined to the first condition. Now, the property of equal horizontal thrust enables a geometrical construction of the curve to be readily obtained in any given form of arch if two points in the curve be given, and by assuming these two points it can be ascertained by a tentative process if any given arch does or does not contain the curve. Proceeding in this manner, it is found that in a semicircular arch the thickness must be one-ninth of the radius to contain the curve, a result which is completely borne out in practice; for, though apparently unnoticed, a semicircular arch cannot be made to stand without foreign support unless the thickness be greater than one-ninth of the radius. In like manner, in any other form of arch which does not precisely coincide with the curve of equal horizontal thrust, there is a certain minimum thickness, or depth of voussoir, necessary to obtain stability.

#### The Greatness of Classic Architecture.

T. L. DONALDSON.

The architects of Greece and Rome lived in periods when art in those countries was at its culminating point—when men of the most cultivated minds, and of the highest intellectual status in such departments, were engaged in discussing in the schools the laws of taste and the utmost refinements of thought. They laid down the laws of proportion with exactness. The sister arts of sculpture and painting were most refined, and the masterpieces of the highest genius were produced. Neither the one nor the other was obliged to depart from the truthfulness of nature, in order to conform to the arbitrary peculiarities of architecture. Our own eyes see that the works of Phidias, Scopas, Bryaxcis, Timotheus, Leochares, and Pythis were as full of all the just proportions, native grace, and artless *posé* as if the living subjects themselves had assumed the positions in which the sculpture is grouped, and as if the statues were intended for independent purposes. Those artists worked for an intelligent people, and had not to seek adventitious means to make their works come home to the convictions of the multitude. No contortions of form. No excess of expression. The poetic fancy of the artists had its limit, and did not run wild. The sacred edifice did not admit the caricature of sacred subjects, but maintained a tone of feeling and thought removed from everything that was lowly, familiar, and debasing. No masked efforts in point of construction. It is amazing to think that Classical art, with all the magnificent remains we have of the genius of the ancients still existing, should be put upon its trial in England. It is true that the monuments are in ruins, that the completeness of their original state, with all their appropriate accessories and the maintenance of their actual use in our times, do not exist, as in Mediæval buildings; and that the fulness of Greek art is, to a degree, an abstraction, and can only be appreciated by those who have lovingly and profoundly studied the subject, and by so far it stands at a disadvantage with more recent phases of taste. But with such a standard of purity as that revealed by the monuments of Attica, of Asia Minor, and of Rome, not to mention the provinces enriched by the reflex of glory that shed its halo on such ruins as those of the south of France, and in Sicily and Pompeii, a school cannot wander far from the true path unless in ignorance it rejects all antique tradition. It must be an im-

patience of wholesome control, a disregard for sober authority, a wild license of thought and passion for novelty, that would disregard the rich inheritance of the influence of Classic taste, to cripple and destroy which is an act of barbarism and folly, an audacious attempt to throw back civilisation, a high treason against good sense. For their temples, which are the highest expression of art in any people, as being dedicated to the Deity, and coincident with the deepest feelings of devotion in the heathen mind, were objects worthy the acceptance of the Divinity. They were eminent in conception, choice in every detail, superb in embellishment, calculated to excite feelings of reverence and awe; stupendous as to size, striking as to position.

#### Tone in Painting.

J. RUSKIN.

I understand two things by the word "tone": first, the exact relief and relation of objects against and to each other in substance and darkness, as they are nearer or more distant, and the perfect relation of the shades of all of them to the chief light of the picture, whether that be sky, water, or anything else; secondly, the exact relation of the colours of the shadows to the colours of the light, so that they may at once be felt to be merely different degrees of the same light; and the accurate relation among the illuminated parts themselves, with respect to the degree in which they are influenced by the colour of the light itself, whether warm or cold; so that the whole of the picture may be felt to be in one climate, under one kind of light, and "in one kind of atmosphere," &c. The finely-toned pictures of the Old Masters are remarkable for the truth of their proportionate differences, and, though the key-note be far below nature, they are remarkable for the correctness in this respect—the finely-toned pictures of the Old Masters being two or three octaves below the key of nature, but the dark objects in the middle distance having precisely the same relation to the light of the sky which they have in nature, but the light being necessarily infinitely lowered, and the mass of the shadow deepened in the same degree. Now Turner starts from the beginning with a totally different principle. He boldly takes pure white (and justly, for it is the sign of the most intense sunbeams) for his highest light, and lampblack for his deepest shade; and between these he makes every degree of shade indicative of a separate degree of distance, giving each step of approach—not the exact difference in pitch which it would have in nature, but a difference bearing the same proportion to that which his sum of possible shade bears to the sum of nature's shade, so that an object half-way between his horizon and his foreground will be exactly in half tint of force, and every minute division of intermediate space will have just its proportionate share of the lesser sum and no more. Hence, where the Old Masters expressed one distance, he expresses a hundred; and where they said furlongs, he says leagues. Which of these modes of procedure be most agreeable with truth I think I may safely leave the reader to decide for himself.

#### Effect of Time on Slaked Lime.

M. FARADAY.

Led by the statement that the keeping of the lime in a slaked condition for a couple of years is a great advantage to it, I took some specimens from the stores which have been so laid up at the Houses of Parliament, for the purpose of examining them in this respect. It appears to me that this lime (which is in a state of paste) is in a very soft and smooth condition in comparison with what would probably be the condition of the lime recently slaked, a condition which seems to be due to its thorough disintegration as a mass, and its separation particle from particle. On analysing it I found that it contained a little carbonic acid, but not much, for in 100 parts of the dry substance there were but  $5\frac{1}{4}$  parts of carbonic acid; these 100 parts, therefore, would contain 88 parts of quick or uncarbonated lime, and 12 parts of carbonated lime, which, considering the processes of burning, carrying, slaking, &c., that it had to go through, and the necessary time of exposure to air before it was laid up in store, is a very small proportion. I do not believe that the lime, which is more than 4 inches from the exterior, has received any portion of carbonic acid during the two years of its inhumation. In respect of the effect of keeping lime for a time, I am led to think, without however having formed any strong opinion on the subject, that the benefit is due to the fine texture which it gradually acquires; and as there is no doubt that if two surfaces were prepared, the one with fine sand and lime in particles comparatively coarse, and the other with the same kind of sand and lime in particles comparatively far more perfectly divided, that these two would act very differently both as to the access of carbonic acid from the atmosphere and the transition of lime dissolved in the moisture of the mass from the interior towards the surface; so there is every reason to expect that there would be a difference in the degree of action upon the colours at that surface, and also in the time at which that action would come to a close.



## NOTES AND COMMENTS.

FEW can boast of having an acquaintance with the mysteries of heraldry, although at one time the science was comprised in the education of a gentleman. Is it not therefore rather ridiculous for the town councillors of Bath to set up as authorities on the subject? Major DAVIS, their surveyor, is an archæologist of note, and when he commits himself to a conclusion relating to a coat of arms, it might be assumed that he was not acting rashly, for an error in heraldry is more grievous with an archæologist than a false quantity in scholarship. The two essays by Major DAVIS on the Arms of Bath, which we have published, denote the pains the architect has taken in order to elucidate an obscure problem. But the worthy councillors have a preference for one coat-of-arms regardless of all that heralds may say against it, and Major DAVIS's researches are set aside. Application was made to the Somerset Herald, and he arrived at the same conclusion. The council have since resolved to appeal to the Duke of NORFOLK. As the taxpayers will discover, it is impossible to put the Herald's College in motion without paying at a rate that is proportionate to the importance of heraldry. But, meanwhile, the arms which Major DAVIS removed are to be set up again with all their absurdities, in order, we suppose, to teach a lesson to reformers about the perfectibility of corporations.

THE new post-office in Brussels, near the Théâtre de la Monnaie, is sufficiently advanced to enable a spectator to form an idea of its value as a work of architecture. It will be a noble addition to that part of the city. The architect, M. DE CURTE, insisted on full-sized models of the sculpture being placed in position before the commission to execute the figures in stone was given. It was found that the caryatids representing Commerce and Industry were not effective, and alterations will have to be made in them. The two groups of *The Post* and *The Telegraph* also seem to be too large in scale for the building. There will be no difficulty in modifying the sculpture, and credit is due to M. DE CURTE for insisting on his rights as the architect to have control over the subsidiary arts. Too often the sculptors follow their own will, and are indifferent to the relation which should subsist between their figures and a building.

THE Louvre has lost an able officer by the death of M. DE TAUZIA, who had charge of the department of drawings and engravings. He was often employed in missions for the acquirement of works of art, and, as M. DE TAUZIA belonged to a noble family, he was sure of a friendly reception in the most select circles of foreign countries. Several important works were acquired by him, among others two frescoes by BOTTICELLI, which are familiar to visitors to the Louvre. M. DE TAUZIA carried out most of the arrangements for the gallery of nineteenth-century painting and the gallery devoted to portraits of artists.

MR. THOMAS HAWKSLEY, the hydraulic engineer, who, although over eighty years of age, is still able to design and conduct works of importance, has been defeated in an action which turned on a question of joint responsibility. For thirty years Mr. HAWKSLEY has held the office of consulting engineer to the city of Oxford, and in 1880 he recommended one of his assistants, Mr. BURSTAL, to the Council as resident water engineer, at a salary of 400*l.* a year. Soon afterwards it was decided to construct filtering beds, and preliminary plans were drawn by Mr. BURSTAL, and levels were taken by him, but, apparently, little use was made of these plans by Mr. HAWKSLEY, who had plans prepared and sections taken by his own assistants. When the works were undertaken the question was what was Mr. BURSTAL's position? According to Mr. HAWKSLEY's view, that gentleman was supposed to be the resident engineer who was to carry out Mr. HAWKSLEY's designs. But was he to have any share in the 5 per cent. allowed for engineering expenses? Mr. HAWKSLEY says he had never a partnership of the kind, although he had given gratuities to local engineers who had rendered him assistance. He had also objected to an entry by which Mr.

BURSTAL was described as joint engineer, and although the word jointly was put down, for want of a better word, by the town clerk, the Town Council resolved that Mr. HAWKSLEY was to bear the whole responsibility. The Mayor of Oxford and the Water Committee were desirous that Mr. BURSTAL should have some share of the commission, but others were indifferent. Mr. BURSTAL claimed two-fifths of the 700*l.* received by Mr. HAWKSLEY, and on the direction of the Lord Chief Justice his claim was recognised. His lordship considered that originally Mr. BURSTAL was to have sole charge of the works, but that afterwards the Council desired to have the co-operation of the two engineers. The case is one among many where honourable men get to loggerheads because they will not take the trouble to define their positions by writing. Mr. HAWKSLEY believed that Mr. BURSTAL resembled many another resident engineer, whose duty it was to be a sort of clerk of works and carry out his wishes. Mr. BURSTAL, on the other hand, considered himself to be joint engineer with Mr. HAWKSLEY. So long as no more than 5 per cent. was paid, the committee and Town Council were indifferent to the status of their officer, or whether Mr. BURSTAL received the whole commission or none of it. The case is a warning against trusting over-much, for as it turns out, Mr. HAWKSLEY will receive less than 100*l.* for all his work, and he will have to pay all the law costs.

M. JEAN PAUL LAURENS has completed the painting for the ceiling of the Odéon Theatre in Paris. A great crowd of figures symbolic of human passions, some of them being 10 feet in height, are represented as descending through openings of an antique vallum. Beneath are statues of MOLIÈRE, CORNEILLE, RACINE and BEAUMARCHAIS, with busts of VICTOR HUGO, BALZAC, DUMAS, MUSSET and other dramatists, while medallions of GEORGE SAND, HENRI MURGER and others are attached to the columns which appear to support the vallum. The commission for so important a work is a fresh sign of the great enterprise of M. POREL, who, in the forthcoming season, intends to surpass his previous efforts.

A VOTE of 78,000 francs has been passed by the Paris Municipality for the erection of a pedestal on which the reduced copy of M. BARTHOLDI's statue of *Liberty Enlightening the World* will be placed. The statue is a gift from the Americans in Paris, and will be erected near the Pont de Grenelle. The site will allow the statue to be well seen, but the most fitting place for such a work would be before one of the great railway termini.

THE announcement of a competition for Municipal Offices in New York attracted a great many designs, although one of the conditions was that the unpremiated designs should become the property of the authorities. The examination of them was entrusted to Mr. R. M. HUNT, Mr. UPJOHN, and Professor WARE. The judges advise that the first and second prizes should be withheld. As a design by Mr. C. B. ATWOOD is supposed to come nearest to the requirements it is recommended for adoption, but if not pleasing to the authorities the sum of 2,000 dollars should be paid to the author. A prize of 3,000 dollars is awarded to Mr. R. N. CRAWFORD; one of 2,000 dollars to Mr. A. P. CLARK, jun.; one of 1,000 dollars to Mr. J. A. STARK; and an extra prize of 1,000 dollars to Messrs. WESTON & TUCKERMAN.

A MEETING of masters of schools of art was held on Wednesday and (by adjournment) on Thursday, in the Lecture Theatre of the South Kensington Museum, to form an association representative of their interests and of the interests of art education. About sixty gentlemen attended from all parts of the kingdom, and a Society was established to be called the Society of Art Masters. Mr. EDW. R. TAYLOR, of Birmingham, was appointed chairman for the ensuing year; Mr. ALEX. FISHER, of Brighton, vice-chairman; and Mr. FRANCIS FORD, secretary. Membership is limited to holders of an art master's certificate (third grade) from the Department of Science and Art.









BELL TURRETS, VENICE.

Drawn by E.G. HARDY.







The Architect. July 27<sup>th</sup> 1888.



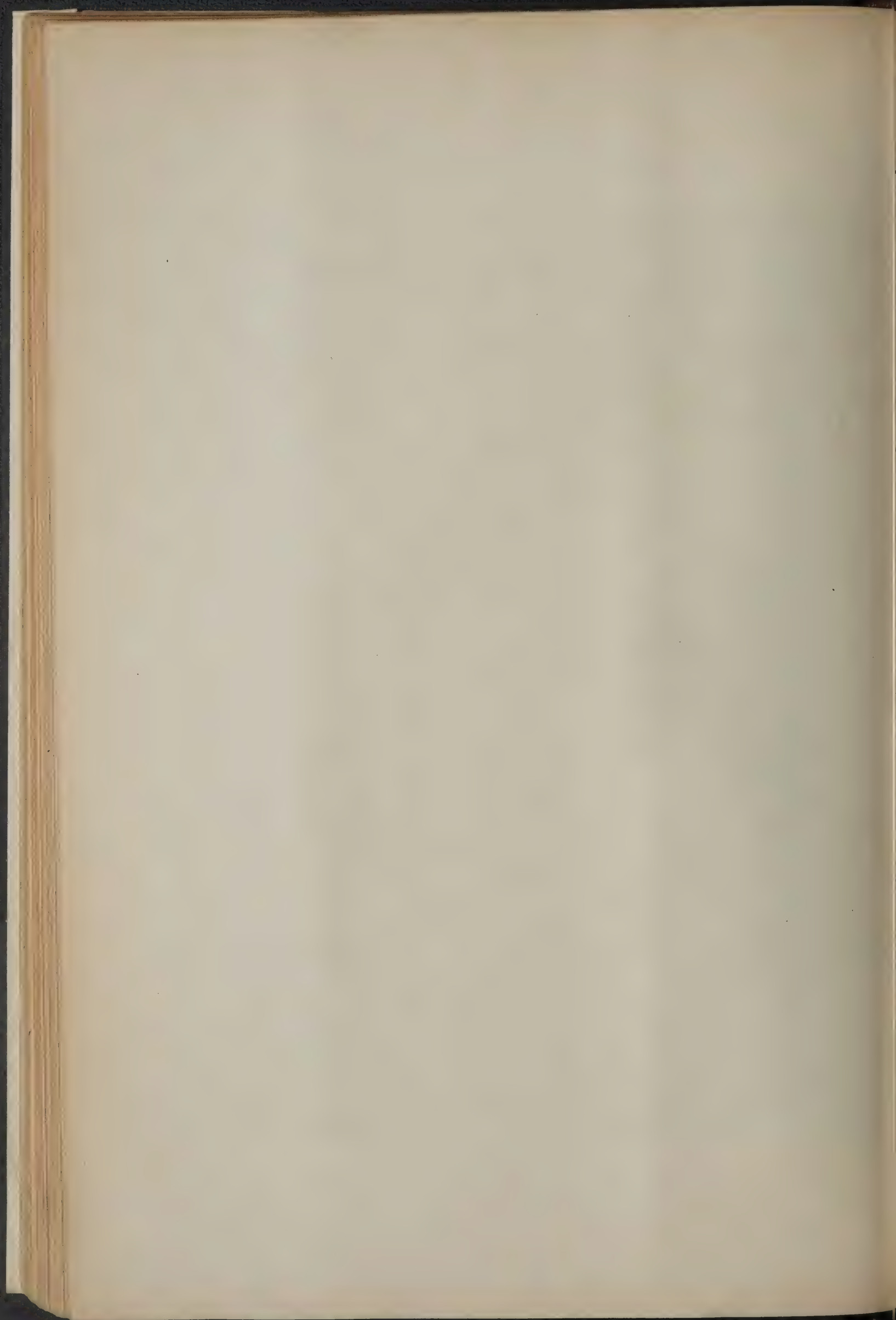




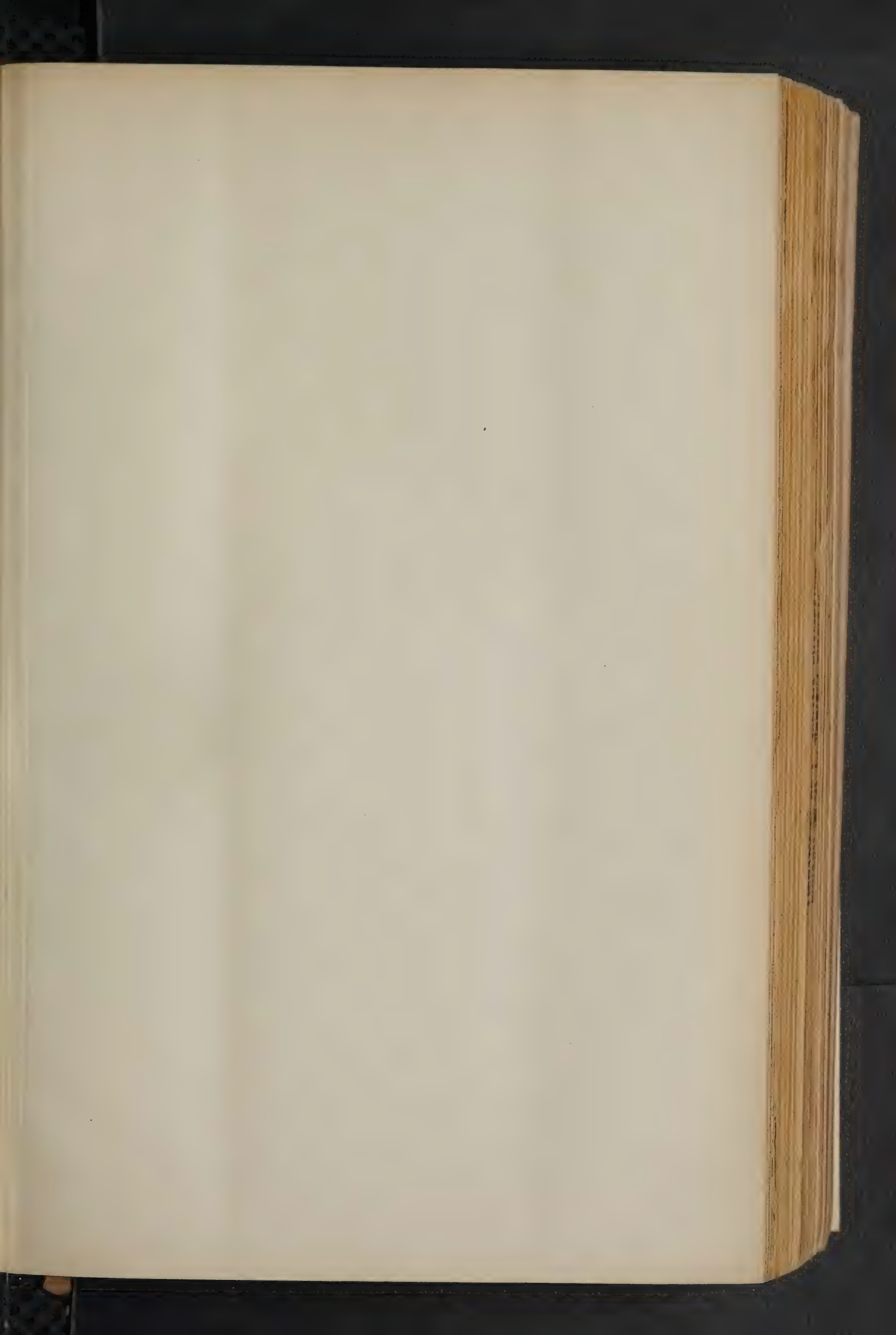
# NEW PREMISES, OXFORD STREET.

FOR MESSRS CHAS BAKER & CO  
 C F HAYWARD, FSA Architect





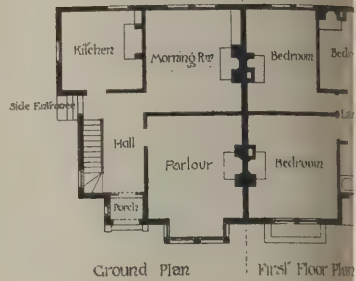






Semi-Detached Houses.  
METHLEY. N<sup>o</sup> LEEDS.

T. BUTLER WILSON. ARCHT  
LEEDS & HARROGATE





17<sup>th</sup> 1888.



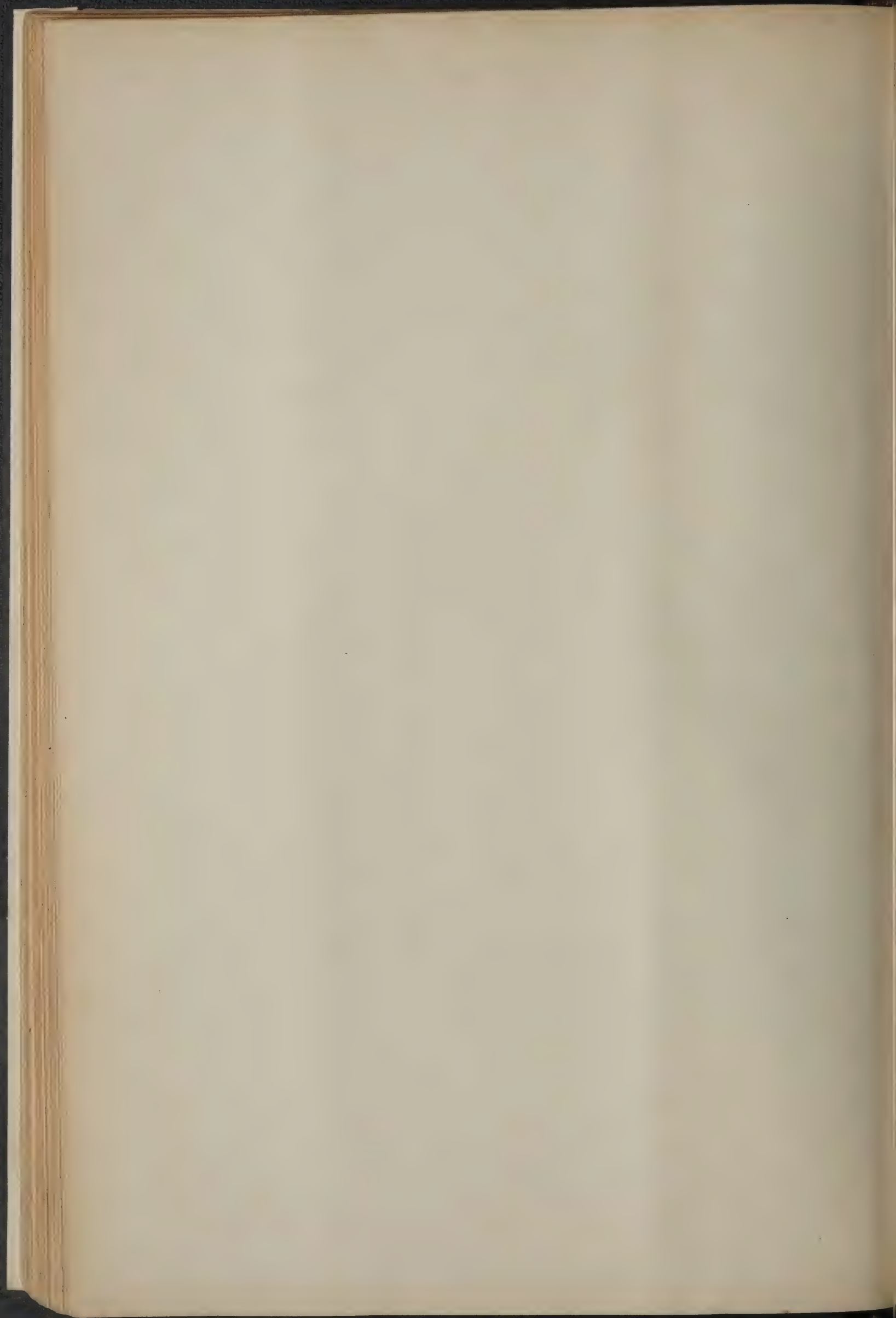
House, Shop,  
& Smithy.  
For-Headingley.

T. Butler, Wilson, Archt.  
Leeds & Horrogate

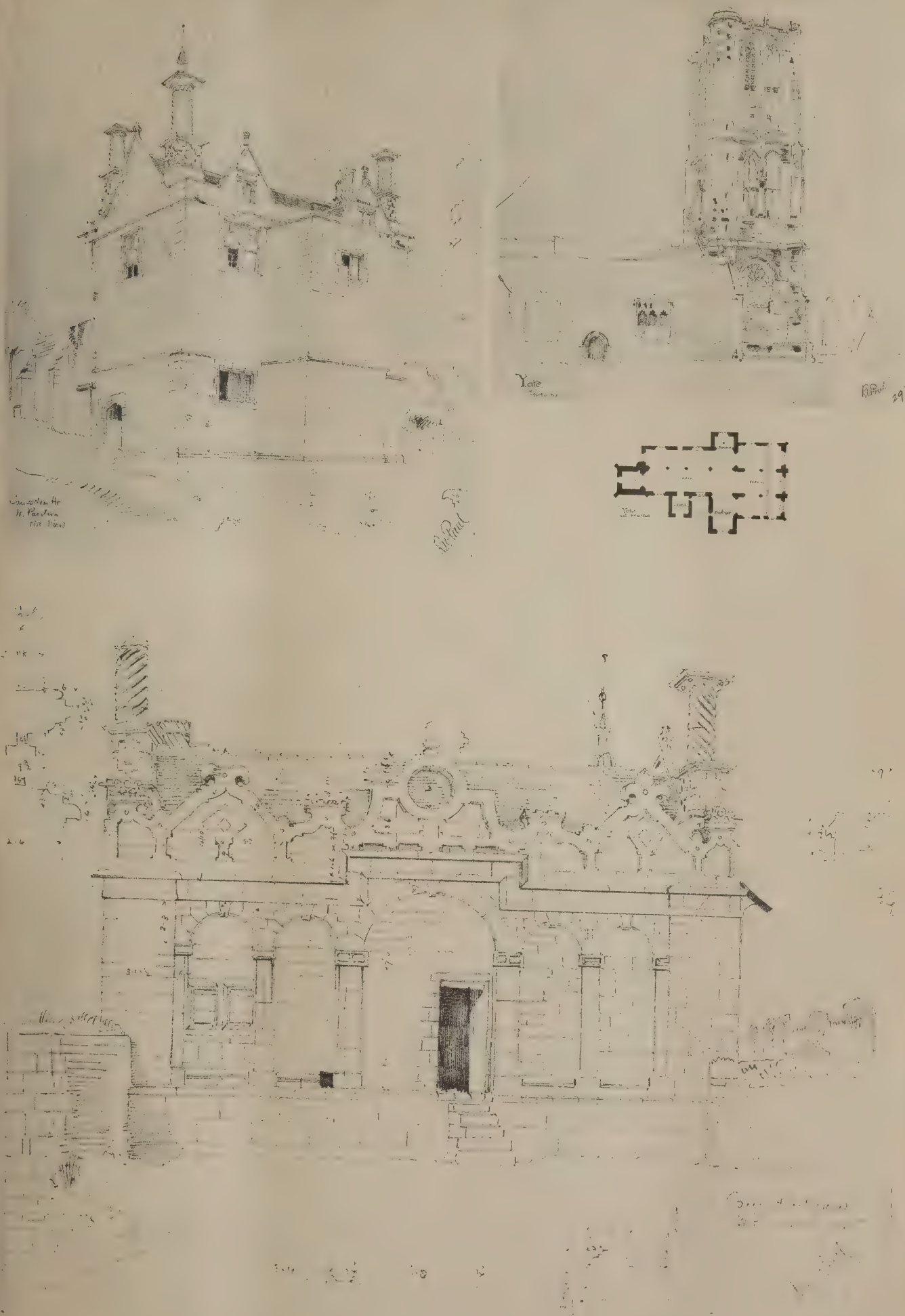


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SKETCHES OF CAMPDEN HOUSE &c.

By ROLAND W. PAUL

PRINTED BY SPENCE & CO. 22, MARTIN LANE, LONDON, E.C.

The Architectural Society. Second Series. Part 7.







## ILLUSTRATIONS.

NOS. 192-194 OXFORD STREET.

IN this design the architect has been able to exhibit the value of good permanent colour in the shape of granites of various tints with red stone and brickwork and Portland stone all combined, so as to produce a harmonious and yet lively composition of coloured materials. The bases of pilasters are of Shap and the pilasters of Alford grey granite. The angle is of red Peterhead granite, while the architraves and window dressings are of the delicate grey granite known as Bessbrook. The main entablature is of Dyce grey and Corrennie pink granite, all highly polished. The red stone is from Warmanbie quarries, and is used in the carved caps of larger pilasters, and in the tympanum, &c. The carving of panels (with the C. B. & Co. monogram in centre) was executed by Mr. AUMONIER, and is similar in idea to the Renaissance work seen at Blois and elsewhere. The builders are MESSRS. DREW & CADMAN, Holborn, and the architect Mr. CHAS. FORSTER HAYWARD, F.S.A., of 47 Museum Street, W.C.

## HOUSES, METHLEY.

THESE houses, which have been recently completed at Methley, for Mr. T. BRAINE, give on the ground floor two sitting-rooms, hall, kitchen, with cellars in basement, and on first floor three bedrooms, landing and bath-room; in the rear of the houses are placed washhouses and offices. The walls are of red brick with stone dressings and timber gables. They have been completed in a most substantial manner, at a cost of 680*l.*, by Mr. P. RHODES, of Leeds, from the designs of Mr. T. BUTLER WILSON, architect, of Leeds and Harrogate.

## HOUSE, SHOP, AND SMITHY, HEADINGLEY.

THESE premises are built of pitched-faced stone with Burley dressings, and consist of smithy with warehouse over, shop, and residence having hall, two sitting-rooms, and kitchen on ground floor, with four bedrooms, landing, bath-room, and w.c. on first floor. The work has been finished with considerable care, the interior finishings being of a substantial character, at a total cost of 587*l.*, from the designs of Mr. T. BUTLER WILSON, architect, of Leeds and Harrogate.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 7.—A BELFRY IN VENICE. [E. G. HARDY.]

NO. 8.—SKETCHES. [R. W. PAUL.]

## SCIENCE AND ART EXPENDITURE.

A RETURN of approximate amounts expended out of votes of Parliament for buildings, furniture, and fittings, and, in some cases, purchase of sites in connection with the existing establishments of science and art, was published on Saturday. It appears that from 1859 to 1888 there had been spent on Burlington House 288,055*l.*, on the British Museum 1,366,259*l.*, on the Natural History Museum 760,771*l.*, on the National Gallery 394,599*l.*, on the National Portrait Gallery 2,236*l.*, on Marlborough House 8,326*l.*, on South Kensington 526,000*l.*, on Bethnal Green Museum 10,455*l.*, on the Geological Museum and College of Chemistry 62,312*l.*, Royal Gardens (Kew) 56,734*l.*, Royal Botanic Gardens and Arboretum 18,113*l.*, Royal Institution 1,200*l.* The return also gives the expenditure on Scotch and Irish scientific and art establishments.

## BOMBAY MUNICIPAL BUILDINGS.

AFTER considerable discussion upon the qualifications of Mr. Chisholm and Mr. F. W. Stevens, says the *Indian Engineer*, the Bombay Municipal Corporation have decided to entrust the design and erection of the proposed new Municipal Offices to Mr. Stevens. The corporation have agreed that the erection of a dome over any portion of the buildings might be left to the discretion of the architect. It was also resolved that the length of the council chamber of the new Municipal Hall be 65 to 70 feet, and that the breadth and height of the same be left to the discretion of the architect.

## THE LAKE DEPOSITS OF SOUTH DEVON.\*

BY S. SMITH HARVEY.

THE Great Western Railway leaving Exeter runs down the west side of the Exe estuary, skirting the sea and the red sandstone rocks of that beautiful coast, and at Teignmouth opens up the estuary of the Teign, and rapidly reaches Newton Abbot. Leaving that town, and following the river for about four miles, the naturalist finds himself in the centre of the Bovey Heathfield, and one of the most interesting geological deposits which we have in Great Britain. On either side the ground slopes up to the moors, crowned with weather-worn granitic rocks, which at some remote period must have been forced through the strata below, to a great height, and since then have again been denuded by the storms which for untold years have beaten around them.

This interesting and beautiful spot was once a miocene lake, and the only example we have of that period in our country. It seems, as has been justly remarked, as if the ordinary conditions were here entirely reversed. Generally we find the high ground covered with gorse and bracken, and the valleys smiling with corn; but here the uplands are rich in corn, and the old lake bed is given up to sedge and gorse. The reason is apparent, for where we now stand was doubtless a million or so years back a beautiful little lake, and the valley of to-day, with its potteries and clay works, was then a scene of tropical luxuriance, followed later on by a glacial period. Referring to this scene, Sir C. Lyell writes:—"On the west and north-west rise the lofty granitic hills of Dartmoor, with their burden of metamorphic rocks; on the north the trappean elevations of Hennock; and on the east and north-east the greensands of the Chudleigh district."

What was once this deep quiet lake of about nine miles in length by about three in breadth, and from 200 to 300 feet in depth, has by the unwearied efforts of nature been gradually, century by century, filled up a grain at a time, until the water has gone, and we have left a lake of valuable clay. Nature, with that wonderful provision of hers for our wants, gives up for our use, in the form of a thousand things of utility, that which a few years since was cursed as a soil that would grow nothing.

Let us see what is the nature of the material which has filled up this old-time lake, and whence it came. We are amazed at the lapse of time which must have occurred from the period when nature began her work until she completed it. Given a light friable soil, it would not be difficult for many a rivulet and stream to fill up a lake ten times as large as this one; but the conditions here were very different, for the whole district around the old lake is formed of granite and consolidated greensand. If we examine one of the many clay pits which abound here, we shall find that the clay is a mass of disintegrated granite and greensand, which has been set free by the action of the weather, mingled with the waters of the lake, and gradually deposited on its bottom until it has filled it up.

This old miocene lake is of special interest to geologists, for all we know of that period, as far as this country is concerned, must be found here. It is, I believe, generally thought that at this part of the Tertiary period Great Britain was joined to the Continent, for it seems certain that the sea did not approach this district, or we should find marine deposits, which we do not.

The general conditions of the district were pretty much what they are now. Then, as now, the granite rocks of Dartmoor must have faced it on the left, and the ridges of Haldon on the right. The rocks and boulders must have been forced up long before the lake existed, as is clearly proved by the fact that the lake is filled by the detritus from them. The great rocks of Dartmoor must have existed from the Permian period, and probably stood out a mountain island in the midst of the triassic and oolitic seas, during the period when the great chalk deposit of Southern England was being laid down. Professor Judd tells us that the contemporary volcano of Mull, in the Hebrides, probably lost three-fourths of its height by the grinding of the Glacial age, and the wear and tear of the recent periods.

Granite, which appears to be so hard, when assailed by the unceasing wear of time, has to give way, and in this case was carried down in thousands of tons to the lake below. There must then have been no Teign estuary, or no lake would have been formed. Probably the gradual rising of the lake bed caused the waters to force a fresh exit, and thus this outlet was formed. With regard to the vegetation which covered this district at the early period of which we are now treating, we are indebted to Mr. Pengelly, F.R.S., of Torquay, for much of what is known, and I am also much indebted to Mr. G. Ross Divett, F.G.S., of Bovey, for much valuable information and many interesting specimens bearing upon this subject.

\* A paper read before the West Kent Natural History Society, at Blackheath.



This lake is famous for its extensive deposits of lignite or wood-coal, and to it we must look for enlightenment as to the flora of that period. Mr. Pengelly remarks that England then enjoyed a sub-tropical climate, which must have generally resembled that of the Lower Himalayan slopes in its character. The lignite has been examined carefully by Professor Heer, of Zurich, who is eminent for his knowledge of fossil botany. His examination has resulted in establishing the fact that evergreen oaks and eucalyptus covered the uplands, many tropical trees and shrubs the valleys, and the low grounds abounded with the most glorious ferns. The mass of the lignite appears to be formed from the remains of a tree much resembling the *Wellingtonia gigantea*, and called in honour of the Baroness Burdett-Coutts, *Sequoia Couttsiae*.

Water-lilies blossomed on the margin of the lake, and even the presence of the fossil seeds of grapes have been determined. As Mr. Grant Allen eloquently remarks:—"This little revelation of the past tells us what was the condition of our country in the day before yesterday of geological history, before that cold spell from whose lasting results the circum-polar world is only now beginning to recover itself." Mr. D. Ramsay, speaking of Professor Heer's remarks on this subject, says:—"A description so vivid needs no comment, and of this we may be sure, that this fragment of a flora only represents a small part of that of a vast continent to which the British Isles were united, and which, embracing Ireland, spread far to the north and west into the area of what is now the Atlantic, and on the south was united to Africa, when, as yet, the Mediterranean had no existence." We learn little or nothing from this spot of the animal life of the Miocene period, and Mr. J. H. Kay, in a paper read before the Geological Society, remarks:—"We can with our present amount of knowledge suppose either that no animals existed around the old lake, or what is more probable, that the conditions of the strata were inimical to the preservation of animal remains," and I venture to think that nothing is more likely than that they would be quickly absorbed by the rampant vegetation around.

Of course we could by inference learn from other similar deposits on the Continent and elsewhere what was the nature of the animal life which thrived in this old world corner, but we have nothing in the South Devon deposit to start from, and we must leave it. It may here be interesting to notice that in 1881 was found in the clay pits of Messrs. Candy & Co., which are close to the Heathfield station of the Great Western Railway, an ancient canoe under about 20 feet of clay. After being carefully dug out it was examined by Mr. Pengelly and others, and it excited a great deal of interest at the time. Unfortunately when dry and exposed to the air, it quickly fell in pieces and became valueless.

Mr. Blake, of Newton Abbot, mentions that about the same time was found in a clay pit near Teignbridge a rude wooden image, in the form of a naked male figure, about 18 inches in height, and of the roughest finish. About three years later some workmen in the same place found a fine bronze spear-head of about 10 inches in length. Two stone moulds for casting bronze weapons were also found embedded in the clay. These, with remnants of potsherds and other minor matters, form the principal objects of interest which have been met with. It is difficult to account for the presence of these objects in the Bovey Lake, and equally so to deduce any lesson from them; they may have been brought from a distance by floods, and have been reburied by the waters. They suggest a Norse or Phœnician origin. The wooden figure may have formed the prow or figure-head of a canoe, or it may have been for purposes of worship. It has been suggested that the canoe was of Glacial age.

Curiously, the only animal remains found in the lignite consist of a few specimens of a fossil insect, detected by Professor Heer, who came over to assist Mr. Pengelly in his researches. It is known as *Buprestes Falconeri*. These investigations were undertaken at the sole cost of Lady Burdett Coutts, and their results were embodied in an elaborate report, which was printed in the transactions of the Royal Society for 1862. Appended to it are many pages of beautiful illustrations of the plants found in the lignite, which are of great interest to fossil botanists.

Turning from the past to the present, it may be desirable for one moment to notice what the wear and tear of past ages in this spot, the ceaseless grinding of the river beds, the disintegrating effects of the weather, and the slow deposit of vegetable matter have given us. First, one of the most valuable deposits of granitic and stoneware clays in the world. As a proof of this, a constant succession of sailing vessels leave the port of Teignmouth for the pottery districts and the Continent, and the export of these white clays forms one of the chief industries of the neighbourhood. At Bovey Tracey are extensive works for the production of earthenware, which is sent through the western counties. There are also large works at Heathfield station, where Messrs. Candy & Co. employ some hundreds of persons in the manufacture of facing, engineering, and paving bricks of a buff colour.

The lignite or wood-coal is of great interest; it was discovered over one hundred years since, and was used as fuel for domestic purposes, and for some manufacturing uses, and even now it is burnt by the poorer inhabitants of the district; but owing to the large amount of ash it therefore produces, it is not a desirable fuel. Apart from this it gives off a disagreeable odour in burning, owing to the mineral oil it contains.

There are large quantities of this coal, and only a use for it has to arise and thousands of tons of it can be raised. Mr. Ross Divett, F.G.S., of Bovey, and Messrs. Candy & Co., of the Great Western Potteries, have caused experiments to be made for its use as a medium for the purification of water and the defecation of sewage with some success, and lately attention has been directed to its use for the decolorisation of sugar.

In conclusion, I will very briefly remark upon the clays as they are found, their value and uses; and here let me direct attention to a test boring which was taken about ten years since, before the works at Heathfield were erected. It will be noticed how small a portion of head, or waste, is found here at the surface, and how much the clays vary in character and quality, improving, as might be expected, as the depth increases. The boring goes down to 130 feet, with no sign of exhaustion. The strata are very irregular towards the surface, probably caused by floods during deposition.

The surface clays of the district are principally used for making a common grey or buff brick, used locally. The white, or potter's clay, is largely used for the manufacture of stoneware pipes and sanitary apparatus, and is valuable for this purpose on account of its ready vitrification. The greyer or fatter clays are used for the manufacture of paving and facing bricks of a more valuable character, which are impervious to moisture and which resist the action of the strongest acids. These bricks are extensively used through the country, and are also largely exported. The quartzose, sandy clays, are made into firebricks, as they contain about 80 per cent. of infusible silica. It is remarkable how almost exactly the Bovey clays have retained the character of the granite from which they are derived, as shown by analysis. From the fact that these granitic clays were deposited in a considerable depth of water, they are, except near the surface, free from stones and débris, and in working have only to be thoroughly mixed, subjected to great pressure, and afterwards burned in Hoffmann kilns at a very high temperature, when thorough vitrification takes place.

The district surrounding the Bovey basin is full of interest, and I cannot do wrong in advising the naturalist to make a note of it as the scene of a summer holiday.

## THE COCKBURN ASSOCIATION.

IN the yearly report, the council of the Cockburn Association state that during the past year no works have been undertaken within the city of Edinburgh calling for special comment. The council then proceed to condemn the proposal submitted to the Town Council to cover over a portion of East Princes' Street Gardens as a recreation hall, and to refer with approval to the alterations at the Castle, and to suggest that the Government might turn its attention to improving other buildings connected with the Castle, particularly the offensive piles of masonry overlooking Princes' Street, and also to removing the gross disfigurements on the south side of the rock. Reference is next made to the completion of the row of buildings at Castle Terrace, to the new Board schools commenced or completed during the year, and to the Public Library. In the latter connection attention is called to the necessity for completing the front of the County Buildings facing George IV. Bridge. The University dome and hall, the Buccleuch statue, and the Students' Union each receive a paragraph—a hope being expressed that the removal of the buildings adjoining the Students' Union may render the site more satisfactory. In the matter of street architecture, it is remarked that the council of the Association have observed with great satisfaction the memorandum issued by the Dean of Guild Court for the guidance of architects and master builders, designed, in the words of Sir James Gowans in the preface, "to facilitate the preparation of plans to be submitted to the Court, and to secure the erection of sound, sanitary, and tasteful houses and buildings." A suggestion is made that certain lime-trees in Queen Street Gardens should be better looked after. The council proceed to express satisfaction at the restoration of the turf to the West Meadows, and hope the ground at the foot of Pitt Street, Falcon Hall, and the Braid Hills may be made available for the use of the citizens. Disapproval is expressed at the proposal to put the expense of the Botanic Gardens on the University. Under the heading "Eyesores," the citizens are reminded of the gaswork chimney, likely soon to become their own property, and the days of which, it is hoped, are numbered. When the arrangements for the prevention of the pollution of the Water of Leith have been carried out, the mill lade, it is



recommended, might be dispensed with. A stair from the Dean Bridge to the walk below is suggested, and further on attention is drawn to the increasing prevalence of enormous advertisement hoardings in the city. The death of Mr. William Nelson is referred to, and the hope expressed that his mantle may have descended on some other citizen of equal taste, liberality, and public spirit.

### ROYAL ARCHÆOLOGICAL INSTITUTE.

THE arrangements for the approaching visit of the Royal Archæological Institute of Great Britain and Ireland to Royal Leamington Spa are completed. The patrons of the meeting include Mr. Jaffray (high sheriff of the county), the Archbishop of Canterbury, the Marquis of Northampton, the Earl of Warwick, the Bishop of Worcester, the Right Hon. A. W. Peel (the Speaker), and many others; while Lord Leigh ranks as president of the meeting. In the list of the vice-presidents are the Mayors of Birmingham, Stratford, Warwick, Coventry, and Leamington; Lord Compton, Mr. J. S. Dugdale, M.P. (recorder of Birmingham), and many of the local clergy and gentry. There will be three sections—the antiquarian, historical, and architectural. The opening meeting will take place on Tuesday, August 7, when there will be an inaugural meeting at the Town Hall, an excursion to Stratford, and in the evening the antiquarian section will be opened. Wednesday will be devoted to excursions to Banbury and the opening of the historical section. On Thursday the annual meeting of the members will take place, and in the evening there will be a *conversazione* in the Town Hall. Friday will be devoted to excursions and sectional meetings; and on Saturday there will be an excursion to Coventry, and a sitting of the sections. On Sunday there will be a special service at the parish church, and on Monday, Tuesday, and Wednesday, the 13th, 14th, and 15th, a succession of excursions to Hatton and neighbourhood, Leicester, Melton Mowbray, and Ratcliffe College.

### ARCHÆOLOGY IN GLOUCESTER.

THE thirteenth annual meeting of the Bristol and Gloucestershire Archæological Society was held at Gloucester on Monday, Tuesday, Wednesday, and Thursday of last week. At the preliminary meeting the annual report was read, which stated that there are at present 389 annual, 77 life, and three honorary members, in all 469 members. The income for the year, including a balance brought over, was, excluding fractions, 535*l.*, the expenditure was 271*l.*, and the balance in hand 263*l.*; but from this latter sum had to be deducted the charge for the annual volume of Transactions. A balance of 80*l.* was still due from the Berkeley MSS fund to the general fund. The society had, moreover, a funded capital of 432*l.* The *Gloucester Chronicle* contains a report of the proceedings, which is marked by the accuracy that is characteristic of the journal when treating of archæology, and from it we take the following:—

Mr. R. V. Vassar-Smith, the president for the year, selected the archives of the Gloucester Corporation for his opening discourse. He remarked that the city possessed a truly grand collection of very early deeds. Its importance may be readily brought out by a contrast with those possessed in other ancient borough records. The Nottingham Corporation possess only 13 deeds older than the year 1300; at Leicester there is one small packet of deeds of this period; at Southampton 14 deeds, and the King's Lynn Corporation possess 12. But at Gloucester we have no less than 571 deeds of this time, and of that number 81 belong to the first quarter of the thirteenth century—some are even earlier—159 to the second quarter, and 232 to the third quarter. Incidentally they throw great light upon local and personal names, and they contain scores of early field names. A large proportion of them relate to Gloucester, and they preserve the early forms of the street names, &c., in the town. From one of them, dated August 5, 1347, we learn that the prior of the hospital of St. Bartholomew, rector of the church of St. Nicholas, granted permission to the parishioners to build upon a piece of land between the wide door and wall of the church on the north and the king's highway on the south, extending in length from the stone wall at the back of the chapel of St. Mary in the same church on the east to the stonework of the belfry of the said church on the west, on condition that all rent or profit arising from the said building should be applied to the repair of the church. The building appears to be what is known as the south aisle of the church, which is a singular feature in the structure. Another deed, dated 1347, is a grant from the prior of St. Bartholomew to the White Friars at Gloucester of an aqueduct from the spring called "Goswhitewell," to be brought by means of a lead pipe under the land of the Hill, now part of Wotton. It is rather interest-

ing to read of lead pipes at so early a date, but this is not the only case in the Gloucester records, for there was at this time a lead pipe bringing water from Robin's Wood Hill to the abbey of St. Peter and to the Greyfriars.

#### *Gloucester Cathedral.*

The first visit was to the cathedral. On assembling in the choir an address was delivered by the Dean, who said their glorious old minster church of Gloucester registered, if he might use the term, a strange and mighty epoch in the civil and religious history of England, as well as of Germany, France, the Netherlands, &c. In the cathedral they passed from the stern and solemn grandeur of the Norman nave, with its massive columns, unadorned roof, and comparatively little windows, through an iron gateway into the perfectly new and strange building in which they were then sitting. It would seem as though they were entering another age. Other thoughts had evidently been at work there. The views, aspirations and wishes of the builders of this part of the great minster had evidently undergone a mighty change since the period when the other parts were constructed. Here there were no massive fortress-like pillars; here the roof soared to a height never attempted in the Norman nave, and with York and Westminster it shared the distinction of being the highest in England. A perfect lacework of tracery in stone covered the storied roof; the comparatively little windows gave place to vast openings, generally filled with rich jewelled glass, one of which positively claimed to be the largest in Europe, and rather larger than that of York. The student would wonderingly ask whether centuries had elapsed between the period that produced the Norman nave and that which gave birth to the builders who changed the great cathedral into these two forms of decorated richness; and he would be surprised to learn that about one and a half centuries elapsed between the two ages. What happened in this period that brought about so great a change? The answer supplied something of the causes which were at work, and which produced, not the nave and choir of Gloucester Cathedral, but Gothic architecture, one of the earliest forms of which was the Gloucester Perpendicular. It was too much the habit of people to say that architecture was derived from one form after another, from simple means apparently in the architect's studio. But nothing was further from the truth than this. The architect was simply a man who worked out the needs of his time. We must go far deeper than the architect's studio to find out the meaning of Gothic architecture. At least that was his theory. At the time of William the Conqueror, his father and sons, roughly speaking the eleventh century, there was a feeling not only in England but also in France, Germany and the Netherlands, of insecurity and of perpetual danger to life and property. No one was secure. Perpetual wars harassed Saxon England, as well as France, the Netherlands and North Germany; they were terrorised by the sea pirates from Denmark and the Northern countries. In all the kingdoms he had mentioned the Sovereign was dominated by an ever-changing succession of professing subjects, but really independent and powerful chieftains, men at constant warfare with their liege lord or with one another. What wonder was it, then, that the churches built in these stormy days in many ways resembled fortresses? The dominant idea in the architect and builder's mind was that the pile they were designing and erecting must be capable of being defended. The same thought prevailed in regard to a palace or a house. Thus when William the Conqueror erected his London house he built the Tower of London, and its White Tower still threw its shadow over the waters of the Thames. So when an abbey was designed the same thought coloured the builder's design. A great abbey or minster like Gloucester was not meant to stand a siege, or to receive a garrison of men-at-arms, but the fortress idea could never be dismissed from the mind of the architect; hence the enormous thick walls, the massive pillars, the small apertures just enough to admit a little light and not enough to admit a missile; hence the ponderous battlemented tower, such as we saw at Tewkesbury, probably designed by the same mind as produced its grander sister at Gloucester. What was applicable to England in this matter was also applicable to other countries. From the day of Hastings onwards a new state of things began. Gradually under the strong rule of the Conqueror the general feeling of insecurity ceased. Before the middle of the twelfth century there was no real fear of a disturbance at home; no dread of invasion abroad. The rule of the Vikings had become a terrible story of the past, while the strong hand of the Angevin King crushed down independent action, and the idea of a stronghold and a fortress became less and less a prominent thought. The architect and the builder had greater scope for the exercise of their skill. From 1150 to 1216 the new minster churches which were planned were on the lines of Serlo's church at Gloucester. A new spirit of architecture, termed Early English and Decorated, had for many years been felt. This showed itself in a marked manner in Edward II.'s reign, when Abbot Thokey substituted in the south aisle for the former plain windows the



splendidly-decorated windows we now saw. But the full development of the new idea was not yet, though it was close at hand. The fortress idea was the great notion which inspired the Norman builders. But there was another feeling at work. There was, we must remember, a great religious revival. It began before Norman William's time, but it was really carried out about that time, in the middle of the eleventh century. It had begun before that, when Dunstan was Archbishop of Canterbury. But the real great religious revival was, we might say, in the second half of the eleventh century. The ordinary thinker had no conception of what the state of the Anglo-Saxon Church was when there was scarcely a clergyman who could read the Latin tongue, in which the service was then performed, and simony prevailed everywhere. The great preferments in the Church were constantly given to very young people, who, in many cases, were utterly unfit for the work. Money was received and taken for benefices, from the small chantry to the abbacy of a great abbey. In addition to which, he grieved to say, the morality of the Church in the days before the great revival was very lax indeed. Then came the great revival, and men of gigantic power were raised up, such as Hildebrand, the great Pope, and our own Dunstan; and in the middle and latter part of the eleventh century we came to the great names of Lanfranc and Anselm, archbishops of Canterbury. There was also a great reform in morals, and the services were changed. These two great thoughts were to him at the bottom of the new architecture. Very shortly after William's death we found the architecture gradually changing. The Early English and Decorated came in with the great religious revival; then the Perpendicular was a development from these other styles. The great Gothic cathedral was the perfect place for the great Mediæval service, which could never have been carried out in its entirety in a Norman building. It needed buildings like this. There were people who told us that the origin and suggestion of the Gothic arch was the arching of trees in the avenues of a forest. That was very ingenious, but utterly false. Nothing of the kind could possibly have been produced. Another favourite theory was that Gothic architecture was derived from Saracenic models. This as a theory was equally false. It was certain that the Crusades exercised an influence upon architecture, and it was not improbable that certain models of arches were derived from the East. But it was absurd to suppose that Gothic architecture sprang from Saracenic models. In a great Gothic building like the cathedral we had all the symbolism of glorious Christian art. We had the building first of all in the shape of a cross, with the nave and two aisles; and we often had, though not in Gloucester, but for instance in Strasburg, a mighty rose window at the west, which typified the Unity. We had in almost all these grand old fanes a great crypt beneath, which was beautifully symbolical of the world beneath where the soul rested in peace waiting for the Judgment morning. We had in these buildings other kinds of symbolism—the high altar at the east end; the windows of the clerestory typifying the mounting of prayer up to the Throne of God—and other symbolism of the imaginative mind. Though we might not positively approve of all that our ancestors did, we were men enough to give them credit as men of prayer and men of action, and when we stood in such a building as Gloucester Cathedral we could say that no such building has ever appeared since the fourteenth century.

An examination of the cathedral was then made, one party being taken over it by the Dean, another by the Rev. W. Bazeley, and a third by Mr. F. W. Waller. The latter gentleman commenced by exhibiting the ground plans of the crypt, the general building, and the triforium, which have been carefully worked out by Messrs. Waller and published. By this means the remains of the old Norman church were shown in relation to the later work built upon it. The Abbey of Gloucester, as most of our readers know, is believed to have been founded by King Osric towards the latter end of the seventh century. Abbesses were its first rulers, and afterwards secular priests, and 200 years later Benedictine monks. In 1058 a new church is said to have been completed by Aldred, Bishop of Worcester, but the position it occupied is unknown. The history of the cathedral as it now stands commences probably with the abbacy of Serlo, who was appointed in 1072, and he is recorded to have completed the edifice in 1100. Nearly the whole of the crypt and the main walls of the building, except the lady chapel and the cloisters, are up to a certain height the walls of the old Norman church, but cased with work of later dates, extending from 1150 to 1550. During the abbacy of Thokey (1306-1379) the body of King Edward II., who was murdered at Berkeley Castle, was brought thence, by direction of the abbot, and buried in the cathedral. The offerings made at Edward's tomb greatly increased the wealth of the abbey, and thus provided the means by which many of the finest portions of the present structure were erected. The Norman pilasters, piers, arches, and triforium, the north aisle of the nave, and the abbot's cloister and chapter-house, were erected during the abbacy of Serlo (1072-1100); the Early

English groining of the nave, and the north transept and reliquary, about 1240; the south aisle of the nave, with the Decorated windows and groining during the abbacy of Thokey (1307-1329), and the ambulatory and chapels, with their Norman walls and groining and the Decorated and Perpendicular windows inserted in Norman openings. The choir and presbytery 1337-1377. The cloisters (the finest in England), of Perpendicular style of architecture, were erected 1351-1412; the north transept (Perpendicular on Norman walls) 1368-1373; the south porch and west end of the nave and aisles, the Perpendicular windows of the nave 1421-1437; the tower (Perpendicular) during the abbacy of Seabroke (1450-1457); the lady chapel (Perpendicular) 1457-1499. The parties who accompanied their respective guides had reason to be well satisfied with the explanations which were given of the various portions of the building, which were thoroughly well examined, the visit of each party being so timed as not to interfere with the other. All the well-known features of the glorious old cathedral were indicated or dwelt upon, and its unique beauties pointed out. An examination was also made of the tentative decoration of part of the reredos with gold and colour. Although many observed the experiment in silence, some of the members did not hesitate to express their approval of the proposed addition, on the ground that the beauty of the workmanship displayed by the sculptor could be more readily appreciated, while others did not hesitate to condemn it as tawdry and unworthy of the solemnity and reverence so fittingly inspired by the noble building.

#### *Masons' Marks in the Cathedral.*

At the evening meeting, Mr. Henry Jeffs read a paper on the Mason's Square monument in the south transept of the cathedral, and masons' marks generally. The paper was illustrated by large and well-prepared diagrams of great numbers of these marks. Mr. Jeffs said that masons' marks were very old, although it was only half a century ago that they assumed archæological interest. Then it was that they came under the observation of Mr. Godwin. The Fraternity of Freemasons, to whom some of those present belonged, and who were recognised for marks of symbolical significance, had no attachment at all with old masons' marks. That Fraternity could go back no further than the year 1717. "All squares, levels, and perpendiculars were true and proper signs by which brethren of the Fraternity of Freemasons know and recognise each other." He could develop nothing beyond that except to his brother Freemasons. Digby Wyatt alleged of old operative Freemasons that they were itinerants, wanderers upon the face of the earth, to see what they could see and to live upon what they could earn in pastures new and green, depending upon the protection of masons' lodges, to which it was said they claimed affinity, styling the associations as "mother lodges," and that they possessed grips and passwords upon which they relied. But what were these "grips and passwords"? Simply speculative! We were told these lodges of the ancients went to decay until their revival in the eleventh and twelfth centuries. In the fifteenth century there was a Trade Union of Freemasons, which brought the civil power down upon them, which defined when the operative masons should work, and how they should work, and what wage they should receive, and their obedience to law and order was insisted upon. Monarchical and ecclesiastical authority were on the side of operative masons so long as the masons were obedient. But the masons sometimes rebelled, and their societies were suppressed. Masons doubtless rebelled against kingly power and the supremacy of the Pope. Abbots, monks, and their subordinates had little if any architectural knowledge, and no geometrical power. Mr. Godwin travelled England, France, and Germany, and found hundreds of masons' marks, but he could make neither head nor tail of them. Mr. Jeffs then went on, by the aid of the diagrams, to point out and discuss the peculiarities of these old marks. Such marks were found on the Egyptian Pyramids, on the excavated walls of Jerusalem, throughout Europe, in Mexico, Peru, Asia Minor, and the lecturer expressed his belief that if these marks were to have explanation, Oriental scholars, learned linguists, and philologists of careful study, must give long lives to the task. He showed that monumental inscriptions in Carthage, of which he had procured copies, and marks in the Egyptian almanacks, resembled some of the masons' marks in Gloucester. Referring to the Masons' Guilds, he said that Gloucestershire was asserted to have had a School of Masons of its own, and the cathedral of Gloucester was localised as an Architectural College. It was claimed that a College of Freemasons traced back to the days of Claudius Cæsar, and that a temple was dedicated to Neptune and Minerva, a tablet of notification of this being preserved at Goodwood, having been unearthed at Chichester. Coming then to the Mason's Square in the cathedral, Mr. Jeffs stated that nearly twenty years ago he wrote an article in reference to it, and the publication of this article in the *Gloucestershire Chronicle* led to a correspondence between him and the late Mr. J. D. T. Niblett; and he also published an article in a



London magazine, with a woodcut illustration of the monument, which he now showed. Some years prior to this he had read:—"The two figures of the mason and his son or apprentice, who were employed upon the improvements made at this time, is a curious reminiscence of two very skilful operators. In many of the foreign cathedrals are sepulchral and other memorials of the heads of the lodges of Freemasons, some represented with the rule, the compass, and square, practising the art of setting out the respective works." The monument was attributed to John Gower, who was alleged to have killed the young man shown also on the monument for neglecting his duty. But this tale was told of other chapels and cathedrals. Rosslyn Castle had an old man's head and a young man's head. The latter had a streak of ochre or blood to show that the old man had killed him. He heard a similar tale a quarter of a century ago at Lincoln Cathedral. He believed the Norman builders borrowed these marks from the Romans; and who could reveal the meaning of the masons' marks in Gloucester Cathedral? He ventured to suggest that they were nothing more nor less than the workmen's own private marks, just as was and is the case in some porcelain works, where in the manufacture of china each individual puts his own private mark on the piece of porcelain he completes; and in his opinion the marks represented nothing more than some fancy idea of the workmen themselves, and were often varied by them without any meaning being attached to the variation. The marks we saw on the stones in our old abbeys and cathedrals were no doubt similar workmen's marks to those found on china, and their origin cannot be traced, as it was a custom old as the world, and must have been in operation since the earliest days of stone buildings, as marked stones are found in Egypt and Carthage and all other parts of the civilised world. Trade marks were nothing more nor less than the outcome of these private marks, and were only used to distinguish one man's products from those of another. No doubt many marks found on old stones in our churches were cut by the workmen as a pastime, just as a man might now cut his initials on an oak bench for amusement.

The Rev. W. Bazeley said he had given some little attention to the marks in the cathedral, and though he did not believe they meant much, he thought a great deal might be learned from them as to the dates of the several parts of the building. The marks in the nave were so very different from those in the crypt that it did not appear that the same masons could have made them; and if this could be definitely settled, it would also help to settle the disputed question whether the crypt was the work of Serlo. He thought there were two kinds of marks—those of the workmen who cut the stone in the quarry, and those of the master mason or master of the guild; but as to whether the marks had any symbolic meaning, or whether they were connected with the marks on the Pyramids, he was not prepared to say.

#### *Recent Discoveries in Gloucester Cathedral.*

Mr. F. W. Waller read a paper on this subject. Mentioning how difficult it was to find any feature of novelty in connection with the cathedral, he said he would briefly refer to certain discoveries which had resulted from the repair of the fabric since the Society's last visit to Gloucester. He called attention, first, to the stone having on it the much mutilated figure of an abbot, which was found in the north transept, and is now placed in one of the chapels of the crypt. The stone was 6 feet 10 inches long, 2 feet 6 inches wide, and 6 inches in thickness. The figure was covered with a trefoiled canopy, and the whole was in low relief and in parts incised. The stone was evidently thirteenth-century work, and was formerly decorated with colour, remains of which still exist. The next relics which he described were four hard grey stones, very superficially carved, which were discovered when two of the buttresses of the inner wall of the north walk of the cloisters were being rebuilt. These stones he thought had been used as a parapet or guard to a water-tank of some kind, and the work he thought was of the thirteenth century, and might possibly belong to Helias the sacrist, who was stated to have constructed a conduit of fresh water. These stones might now be seen against the cloister wall. Other specimens of Early English work were found at the same time, and were now placed with the abbot's monument in the chapel in the crypt. Of Early English work much at one time existed in the cathedral, and beautiful specimens must have been destroyed and buried by the monks in the fourteenth century. The lecturer then, by aid of diagrams, described the reservoir for fresh water which was discovered in the cloister garth last year, when it was being laid out as a garden for the Dean. This reservoir was supplied from the Fullbrook. It was many years older than the present cloisters, and he suggested whether this also was not part of the work done by Helias, the sacrist, prior to 1237. The rough stone ribs, of which four remained, and which might easily be Norman work, were evidently meant to carry flat stones placed from rib to rib, and the whole, with the exception of the sluice at the west end, was formerly covered up. The overflow passed underneath the west walk

of the cloister, and the groove for the sluice gate at the western end could be distinctly seen. Mr. Waller pointed out that the remains of the water duct looked suspiciously like an old stone coffin. The disregard shown by Mediæval men for the works of their predecessors was well known, and was evident in numberless instances in Gloucester Cathedral and churches where stone coffin lids and coffins were used for door sills, seats, and paving, and numerous other purposes, and beautiful work, such as the Early English remains previously referred to, were ruthlessly knocked to pieces and buried. Mr. Waller, in conclusion, alluded to statements lately made as to the bad condition of the cathedral, and the necessity for further repairs. To many people these statements must appear somewhat extraordinary, looking to the large sums of money laid out in the last thirty years. But the matter admitted of easy explanation when they considered how much had been expended on the choir and its fittings, on windows for the reception of painted glass, and interior work generally; and though the external restorations had been large and important, consisting of the entire repair of the north and south transepts, the south porch, the pinnacles and parapets of the great tower, and minor matters, yet more remained to be done, consisting chiefly of the repair of defective roofs and parapets, and the general repair and pointing of stonework, all most important works of their kind, and essential for the preservation of the building. Under all the financial difficulties with which the Dean and Chapter had had to contend for several years past, the greatest care had been taken by them to keep the building wind and water-proof, and as far as the interior was concerned no dilapidation takes place. Pointing and general repairs were also carried out, as far as limited funds would allow, on the exterior; but there was no doubt that some of the roofs got into worse state every year, and the parapets on some portions of the building were absolutely ruinous.

On the second day an elaborate paper on "Roman Gloucester" was read by Mr. John Bellows. Afterwards he led a party along the line of the Roman wall, and in the afternoon Mr. Bellows conducted a second party along the same route. The Rev. W. Bazeley read a paper on "Mediæval Gloucester." Many of the old houses and other buildings were visited. Mr. Waller described the ancient houses and the old churches. The Black Friars and its history was related and pointed out by Mr. Medland. The Rev. E. G. Penny, vicar, read a paper on "St. Mary de Lode Church," and explained the building.

The Rev. S. E. Bartleet read a paper on "Gloucester Leper Houses," and the Rev. W. H. Sylvester Davies one on the "Grey Friars or Franciscans." There were also papers on "St. Oswald's Priory," by Mr. Henry Medland; on "Roman Houses," by Prebendary Scarth; and on "Gloucester Tokens," by Mr. J. P. Wilton.

#### ARCHÆOLOGY IN YORKSHIRE.

THE Associated Antiquaries of Yorkshire had their twenty-second annual excursion on Wednesday to Richmond and Easby Abbey. The enjoyment of the outing, says the *Leeds Mercury*, was most exasperatingly marred by rain. A special train from Leeds collected contingents at various points, and the passengers hoped against hope almost that the weather in the dales would be more propitious than that in the places sacred to tall chimneys and the smoke of commerce. But the fleet locomotive brought no introduction to brighter scenes, and when the party were deposited on the platform at Richmond Station, even the most devoted archæologist seemed anxious for the comforts of household fires, both warm and bright. But the enthusiastic members—and they included a large sprinkling of ladies—who had braved the wretched outlook of the early morning, had come armed with extensive protection against rain and were not to be denied. A change of programme brought an alteration, which, as events proved, gave more than a semblance of relief. The excursionists turned townwards, leaving the walk along the damp river-side to Easby Abbey to be achieved under more favourable auspices. In the chancel of the parish church of St. Mary were seen portions of stall-work removed from Easby Abbey at the suppression of the monastery in 1535—a real and not a fictitious instance of such removal. Next was visited the Trinity Chapel, standing in the market place, and showing evidence of a chequered career. It has been so far restored to the Church that divine service is conducted in the "upper room," but the appearance of the fabric is blurred by shops formed in the bays of the lower storey. Last year's excursion to Conisborough and Roche Abbey enabled the members to inspect the circular keep of the castle mentioned in Scott's "Ivanhoe," while now they were able to contrast this with the massive rectangular keep of Richmond, alike commanding from its great size and its bold situation. The keep at Richmond was a favourite subject with Turner, who sketched it from the Easby side, with the torrent-flooded Swale in the foreground, and also from the upper part of the



valley, where it forms a striking feature in the middle distance. Justice has been done to this fine structure by Mr. G. T. Clark—no mean authority on military architecture—who has contributed a paper on the subject to the "Journal of the Yorkshire Archaeological Association." The inspection of the castle was conducted under the cheering influence of some abatement of the storm; and by two o'clock, the hour fixed for luncheon, the rain had entirely ceased. Under the circumstances the members were not wanting in appreciation of an excellent repast; and as by the time that the meal and the speech-making had been concluded the sun had struggled timorously forth, the walk to Easby was entered upon with some measure of agreeable anticipation. The Abbey of St. Agatha, at Easby, was founded in 1152 by Roaldus, Constable of Richmond Castle, and endowed by him with sundry lands; it was further enriched by gifts from the Mowbrays, Alan Bygod, and the Scropes. It was inhabited by Canons of the Premonstratensian Order, who lived according to the rule of St. Augustine, as reformed by St. Norbert, afterwards Archbishop of Magdeburg, who set up this regulation at Premontre (Præmonstratum), in the diocese of Laon, in Picardy. Lord Scrope of Bolton was a Baron of the Exchequer in the reign of Edward II., and Chief Justice in the following reign, and at his death was buried here. At the Dissolution Robert Bampton was Abbot, and there were seventeen Canons under his rule. The site of the Abbey was granted to Ralph Gower, and afterwards to John Stanhope. The ruins were described in considerable detail by Mr. St. John Hope, who in September 1886 conducted excavations under the auspices of the Association. The investigations resulted in the plan of the church for the first time being properly made out, and the discovery of a hitherto unknown chapel or sacristy south of the choir. Perhaps the most important matter, says Mr. Hope, in his contribution to the Journal, was the unravelling of the complete plan of the infirmary, which disclosed one of the completest establishments of the kind—despite its comparatively small size—yet scientifically examined. The ancient gatehouse of the abbey, and the granary in the upper storey, were glanced at; while nearly all the members visited the interesting parish church of Easby, which has some resemblance to that of Heysham, near Morecambe. Mr. J. T. Micklethwaite said that a church existed at Eastby before the Canons of the Premonstratensian Order came there. The nave was semi-Norman. The chancel arch is modern, and was done by Sir Gilbert Scott, who chose the ornate style of some Benedictine Abbey, and not that of a modest parish church. The chancel walls contain Scriptural paintings of the twelfth century, restored about twenty-five years ago, but now much obliterated; and there is a wood screen in early fourteenth-century work. Rain fell again on the way back from Easby to the station, and in the meantime the Swale had become swollen and floods were threatened. The train reached Leeds at 8.45 P.M.

There was a large muster at luncheon at the King's Head Hotel, Richmond, about 105 gathering round the table. The Hon. J. C. Dundas presided.

The Chairman proposed the loyal toasts, and followed with that of "Success to the Association." The whole town of Richmond, he was sure, would regret that the success of the excursion had been marred by the weather. Richmond was really a pretty and an interesting place, and he hoped that the Association would be able again to visit the town under more favourable circumstances. The Society had the elements of success in a good balance at the bank, in the support of a large number of enthusiastic members, and in its very interesting publications. Part of the Association's valuable work was the publication of county and other historical records. The North Riding magistrates had formed themselves into an association for the publication of anything of interest in the county records. He understood also that Mr. Thomas Brooke, the chairman of the Council, had undertaken at much expense to publish the chartulary at Selby Abbey, and this was a noble example which might well be followed. He associated with the toast the name of Mr. Brooke. The Mayor of Richmond (Mr. A. T. Rogers) also supported the toast, which was duly honoured.

Mr. T. Brooke, F.S.A., returned thanks. The Association had long thought of visiting Richmond, but had not before been able to do so. Although they had not been favoured by good weather, many would go away with pleasant recollections of the place. Richmond formed a remarkable centre from which the archaeological and antiquarian remains of the North Riding might be specially studied. The Yorkshire Society had now been established for many years. The contributions of life members were invested, and formed a fund which gave to the Society a basis of prosperity and firmness. Of the Record series, four volumes had now been issued. Thus they had laid the foundation for some future history of the county, which he trusted would be built up in a way which had not previously been attempted. They had taken the first step towards the publication, through Dr. Collins, of an invaluable volume of wills treasured at York; and through the kindness of Sir James Hannen they would have opportunities of going still further in

that work. About 300*l.* was required to get this valuable work fairly well forward, and they had up to now promised of something like 200*l.* For the Record Society there was no lack of matter to enable it to carry on operations for many a year. Through the kindness of Mr. G. T. Clark several valuable works on military architecture were now accessible to the members. The researches at Easby had thrown light on what were previously points difficult of explanation. The fund for the excavation work, raised by special contribution, was getting rather low. They had 30*l.* in hand, and if they could double it they could do all they wanted, at any rate for a short time to come. Besides thanking Mr. Jaques for allowing the excavations at Easby, they also owed thanks to Lord Ripon for enabling similar work to be done last year at Fountains. He trusted Mr. Hope would soon be able to elucidate at Fountains one or two difficulties which had always attended the marvellous remains at that place. It had been suggested that an autumn excursion on a smaller scale to the annual one might be held at Fountains, so that the work could be seen in progress; but that might be a matter for future consideration. There was also a great deal to be done at Mount Grace. He did not know any place in the county where more valuable results might be obtained in the further excavation of what was the most perfect Carthusian remain in England.

After a number of new members had been elected, Mr. A. D. H. Leadman read a short paper relative to the discovery in May of a funereal urn at Minskip, Boroughbridge, on what was thought to be the site of an ancient burial-place about two miles south of Aldborough—Roman Isurium.

### AN IRISH LIGHT AND AIR CASE.

**A**N action was lately taken by a Mr. Flynn, who owns the house No. 19 Parliament Street, Dublin, against Mr. Dollard, a paper merchant and printer, who lately erected adjoining premises, on the ground that the new buildings interfered with the light and air of plaintiff's house. A mandatory injunction for a removal of a part of the premises was sought, as well as damages for the injury already sustained. The defendant had acquired a large block of buildings on Wellington Quay, having also a frontage to Essex Street, which was once occupied by Messrs. Scott, Bell & Co., drapers. He denied that the new building in any way interfered with the plaintiff's light at all, and pleaded that although the height of the Wellington Quay premises had been increased, the slanting form of the roof prevented any obstruction to the vertical light to the plaintiff's premises, and that by the removal of the connecting gallery that existed in the old premises, and the substitution of a glazed white brick wall, the light to the back of the plaintiff's premises had been actually increased. It was also pleaded that no change had been made in the Essex Street building such as affected the plaintiff, because the light to his house could only be interfered with by an increase in the height of an adjoining building belonging to the Board of Works, the rear wall of which faced a narrow space between plaintiff's and defendant's premises.

After hearing the arguments the Master of the Rolls said he was not going to pronounce any opinion whatever in the case without further deliberation, as it was one of very considerable difficulty and nicety. There was alleged interference, not with an abundant supply of light, but with a supply which was already very small, and where the question was merely one of degree. There was also a great conflict between the witnesses who had been examined on both sides, and of course he would have to go very carefully through it. Models had been very much relied on, but these only assisted the other evidence. Counsel for plaintiff in his opening statement had asked him to do what was sometimes done, namely, to look at the premises himself. At that time he declined to do so, being influenced by certain authorities, in one of which such a course was objected to on the grounds that such a proceeding might be impracticable where the premises were at a distance: that the judge might be colour-blind, and that if the judge availed himself of his own observations, a court of appeal might not afterwards be able to distinguish to what extent he acted on his own observation, and the evidence of the witnesses respectively. But when it was possible for him to see the premises it was not illegal to do so, and if the case should afterwards go to the Appeal Court its judges could either view the premises themselves, or decide on the evidence of the witnesses only. The reason why he had changed his mind on the matter, however, was that at first he thought the witnesses would have been subject to cross-examination. The parties had not done that. Therefore, he would visit the premises, and would ask the solicitors on each side to meet him at a convenient hour on the following day.

After an examination of the premises and a week's consideration, the Master of the Rolls delivered judgment. He said that he did not blame the plaintiff for having taken an



intelligent interest in the law on the subject, or manifesting a desire to get pecuniary compensation for any interference with his rights that was shown to have taken place. The witnesses examined on behalf of the plaintiff included persons who had been acquainted with his premises both before and after the erection of the new buildings. Mr. Neale, a former tenant, stated that gas had, since the erection of the new buildings, been constantly kept burning during the day. No account, however, showing an increase in the quantity of gas burned, had been put in evidence. He had been asked by both parties to visit the premises. He had done so, and he should do so in such cases until he was authoritatively told that such a course on his part was wrong. He bore in mind the fact, however, that what he saw was only the premises as they now were. To say that the plaintiff's premises had been, since the erection of the buildings complained of, almost constantly lighted by gas by day, appeared an extraordinary statement, and he hardly thought it could be true of summer time. He saw the premises on a July day at ten o'clock in the morning, the day not particularly brilliant, but the light being improved by the white-washed wall; and he never was in a better lighted shop in his life. The witnesses for the plaintiff had not been cross-examined, though of their truthfulness he had no suspicion. But their evidence was open to the observation that in making their comparison most of them started with a date at least ten years ago, and they compared a state of things which they saw when tailoring business was carried on, and the place unobscured by stock, with a state of things which they saw at the time of the occupation of Mr. Neale, the ironmonger, who immediately used a considerable portion of the place for the storage of stock, which, in the opinion of other witnesses, obscured the place. Their evidence was also open to the observation that not one of them applied any actual test for the purpose of ascertaining the quantity of light, such as the reading of small print. The witnesses for the defendant had largely directed their evidence to the state of things at the present time. Defendant relied on a class of witnesses of whom the plaintiff had availed himself but charily, namely, architects. The evidence of an architect on a question of light and air was—in His Honour's opinion—of neither more nor less value than that of any other intelligent and observant person. He did not adopt the view that there was any charm in keeping within the angle of 45 degrees—in fact, such was not the law at all, although the fact of adherence to such an angle was not to be discussed as a practical average test. He attached decided importance, however, to the evidence of Dr. Algernon Smith, a professional gentleman, who deposed that on May 7, in the back part of the plaintiff's shop, he opened an abscess in the eye of the plaintiff's child, and that he had plenty of light to do so. His Honour regarded that as a practical test of a severe, *bonâ fide*, and distinct character as combating the case of the plaintiff, that not only was the light inferior now to what it was before, but so hopelessly bad as to render the premises unfit for business purposes. The plaintiff had not given any rebutting evidence, although these were matters to which such evidence might have been applied. The plaintiff, in his opinion, had failed to discharge the onus which lay upon him of showing that there had been an interference of such a substantial character with the light of his premises as to entitle him to the relief he sought. If he had been of opinion even that there should be a decree in favour of the plaintiff, it would not have been for a mandatory injunction, because the premises were not in the occupation of the plaintiff himself, and also because the action had not been instituted until long after the defendant's plans were perfectly well known to the plaintiff, and there had been no application—at least that he had heard of—for an interlocutory injunction. Neither was there any case made for damages, and, therefore, he would dismiss the action with costs.

Messrs. Piers White, Q.C., Bewley, Q.C., and G. Price (instructed by Mr. James Goff) appeared for the plaintiff.

Messrs. Walker, Q.C., The MacDermot, Q.C., and Charles Teeling (instructed by Mr. Ambrose Plunkett) for the defendant.



#### A Royal College of Architecture.

SIR,—There was one paragraph in Mr. Thomasson's letter of last week that I was particularly pleased to see, and that was where he stated that he would make an attempt to form a society for the purpose of architectural education in Worcester. I shall be very glad if he will kindly place himself in communication with the secretary of the affiliated societies' sub-committee of the Association as soon as he conveniently can, so that the requisite steps may be taken for the formation of a Worcester Architectural Association.

A word or two of explanation concerning the letter of

December 31 last, which Mr. Thomasson comments on so unfavourably. He states that the letter referred to was "issued by the Architectural Association." This was not the case. The letter in question was not an official one at all, but simply an unofficial inquiry for the purpose of discovering what was the state of public opinion in the provinces with regard to the difficult problem of provincial education. It is important that this matter should be placed beyond a doubt, and therefore I beg to append a copy of the letter.

[COPY.]

Dear Sir,—A discussion of some importance is now proceeding at Conduit Street upon the question of extending the facilities for architectural education provided by the Architectural Association to provincial students. Resolutions will shortly be presented to the Association embodying the principles of affiliation, which will enable several of the more important provincial Associations to join our body. But there is a class of students in the provinces who are not grouped together in sufficient numbers to join societies, and these are the men we want to reach. Might I ask you, therefore, to be kind enough to furnish me with a few notes upon the position of education in the town of \_\_\_\_\_ and surrounding district, and say what modification of our system would be best for it. I should also take it as a favour if you could get hold of the names of the genuine architectural students in and about \_\_\_\_\_, and let me have them. Personally, I think that great use might be made of our monthly journal, "Architectural Association Notes," of which you have doubtless heard. In case, however, you have not seen a copy, or do not subscribe, I have sent you this month's, which I hope you will accept. Asking the favour of an early reply, I am, dear Sir, your obedient servant,

(Signed) OWEN FLEMING.

157 Wool Exchange, Coleman Street, London, E.C. :  
December 31, 1887.

It was the response to this letter which convinced me that schemes after the nature of Mr. Thomasson's are impracticable, or nearly so. I am anxious that the main question in dispute should not be obscured by side issues. I am quite in accord with your correspondent as to the desirability of some such scheme, and I admire the public spirit that has led to its conception and publication. The question upon which I am not convinced is that of its practicability. Let us look for a moment at this matter from a plain common-sense point of view. To take up such a scheme as this, and to prosecute it satisfactorily, means the expenditure of a vast amount of time, of energy and of money. The correspondence that would ensue would be enormous; this branch would have to be stimulated, that to be restrained, and then, sir, the pecuniary difficulties absolutely frighten one. From the very first start expenditure would be continually going on, and we all know that money is much easier to lay out than to get back again. In short, to carry out Mr. Thomasson's scheme with any chance of success would involve the appointment of a paid organiser of no mean abilities, who would have to devote his whole time to the work, and have at his back a fund of no small size upon which he could draw for his expenses.

Now, sir, I ask where are we to look for the funds necessary to pay the salary of such an official and to cover the various expenses? The R.I.B.A. does not possess the power, even if it possessed the will, to provide these funds, and there is no other body which could fairly be asked to do so. The fact is that the money would have to come out of the pockets of those country students who belonged to the organisation, and I venture to assert that it would be almost impossible to get the students to pay sufficient to cover all the costs that would be incurred. This, then, sir, is my difficulty, and I am afraid I must remain sceptical as to the practicability of the undertaking until I can satisfy myself that its financial prospects are reasonably good.

To sum up. I am not disposed to admit that there exists a widespread desire on the part of provincial students for the advantages Mr. Thomasson purposes to confer. And secondly, the financial difficulties are so great as to absolutely preclude the formation of any such system of University extension, at all events for a long time to come. I do not propose to enter into a lengthened defence of the Architectural Association in its rôle as a collegiate body, as I can neither recognise in Mr. Thomasson's letter a really strong argument against the position I took up in my previous letter, nor do I deem myself competent to act as the champion of so important a body. I cannot, however, refrain from briefly alluding to the letter in the A.A. Notes, which—according to Mr. Thomasson—sadly exposes the inadequacy of the Association to provide even for London men. Why, sir, this is simply a letter complaining that there were so many students present at a certain meeting of a certain class, that the writer (presumably another student) could not see a bit what was going on. Yet this letter is what Mr. Thomasson relies on to prove without a doubt the total inadequacy of the A.A. evening classes to provide for the advanced professional education of British architects! Mr. Thomasson will, I am sure, forgive me if I say that the little education I have had in logic is quite insufficient to enable me to comprehend his remarkable deduction.—Yours, &c.,

OWEN FLEMING.



**The Revival of Architecture.**

SIR,—I wish to disagree entirely with the method of Mr. anonymous "Criticus," in singling out any one of our professors as in any way especially culpable, either in his words or designs, in regard to modern style or styles. But in all else I entirely accord with the ideas he expressed last week. Truly, I am overjoyed to find another who is able to publicly declare in favour of the views I have often defended in these columns. Before proceeding, perhaps, I may be excused remarking that I should greatly like to know whether "T.V.S.," of some few weeks ago, has become converted to my theories, and has now commenced to argue on my lines under another totally uncalled for pseudonym—"Criticus"? It may be. However, I do not like the first statement "Criticus" makes. How can a man who is inwardly a pessimist make broad and liberal public utterances? He cannot do it. Should he possess that craft and cunning, he will be false. And of what use is that? In mind as with money—

To thine own self be true!  
And it will follow, as the night the day,  
Thou canst not then be false to any man.

"Criticus," I, and divers others are rightly agreed that the Renaissance was but a clever jumble of late Gothic triviality, with Roman ostentation, and that the impetus of the moment often created vigorous deductions from the best elements of those two divergent styles of a then past age. It was a sort of concentration from which we should take valuable lessons, not copies. Its vigour and essence arose from the advanced state of an enlightened system of apprenticeship, which had been gradually developing itself. The time had come for a revolution. And, behold! the revolution bore exceedingly good fruit, which increased and multiplied and gradually degenerated. Who knows whether the times are not ripening for another revolution, and that it shall come to pass?

The Renaissance served for the sixteenth and seventeenth centuries, for the times of craftsmen and craft-secrets, when a master knew his trade in his own original way.

Another style we need for the nineteenth century, now that our teachers are only "Professors of the History of Architecture," and absolutely do not understand the principles of progressive architecture, or, if they do, yet hide their lights under a bushel and present us with the ludicrous spectacle of broad and liberal thinkers uttering pessimistic nonsense, which is absurd. Aye, and above all, now that lucid accounts of the pettiest details of the styles of the past, together with wise and able criticisms thereon, are to be found in our printed books, truly, now we ought to command a creditable style of our own. And why not, pray? Simply because our books contain all we want or can know of the past, and also the ablest criticisms thereon, but our present professors do nothing more than reiterate the teaching of the books. We do not want them to; it is superfluous. Suppose Huxley, Spencer and Max Müller explained nowadays the philosophy of Hume or of Locke, and that only; or that Sir Frederick and his Forty all painted like Reynolds. This is what our professors are doing to-day. I feel the consciousness of undeniable truth in asserting that we have no professor of "architecture" in the sense that Pasteur is a professor of chemistry, or as Edison and Tyndall are professors of electricity. Our present (the past is gone for ever) professors should devote themselves more to investigation and experiment. We are not school children to want lecturers. We can read as well as they.

I submit that one of the chief reasons why architecture is "down in the dumps" is because those who should devote themselves to study personally, take their knowledge second-hand—undergraduate like; and those who ought to search among the inexhaustible treasures of inductive science when brought to bear upon accumulated facts, spend—waste their time in concocting "natty" lectures cribbed from Gwilt, Fergusson and Chambers, pounded together.

In a word, place the big, the good, the really useful, the expensive books within the reach of all students (as I have suggested in my letters on "A College of Architecture"). Then make your professors discover discoveries. What I mean is, follow in the footsteps of the late Professor Gottfried Semper,\* and Mr. Lawrence Harvey will tell you how. Through ignorance or jealousy, I know not which, British architects in general do not seem to welcome the great German thinker, who knew how to apply the "History of Philosophy" to architecture; this is most likely through ignorance. But why such apathy (apparently) should greet his obliging and worthy pupil (Mr. Harvey) when he has so often volunteered to show us the real value of Semper's theory, is, I fear, due to somewhat of—well, at least, impatience. Our professors would teach architecture as a trade, or, at most, as an elevated craft. Mr. Lawrence Harvey would teach us that architecture is

an art, the principles of which are to be learnt only through "The Philosophy" of its history, and not by its history only.

Remaining more deeply impressed than ever with the belief that, before we can advance our architecture, we must be helped to the knowledge contained in printed books, and that our professors must devote themselves to research and experiment, I am, yours very truly,  
FRÉDÉRIC E. THOMASSON.  
Worcester: July 24, 1888.

**Antiquities of the Isle of Wight.**

SIR,—May I address myself to the readers of your paper? I am getting together the architectural antiquities of the Isle of Wight, and should be glad of any assistance in the way of drawings or notes, which would be duly acknowledged and carefully returned. It so often happens that notes, &c., arrive after publication, and, though of value, cannot be inserted without great extra cost. All I desire is to make the work as complete as possible, as no book exists on this special subject. Trusting your readers will understand the spirit of my letter, I am, yours, &c.,  
PERCY G. STONE.  
16 Great Marlborough Street, W.: July 25, 1888.

**CHURCH BUILDING AND RESTORATION.**

**Hugglescote.**—The chancel added to the parish church of Hugglescote was opened on Thursday in last week by the Bishop of Peterborough. The church is well and centrally situated at the head of the village, and forms a prominent feature of the landscape. The style is Geometrical Decorated, of rather a severe type, suited to the character of the Forest stone of which it is built, this being the greenstone from the quarries at Bardon Hill, with Douling stone for the windows, doorways, weatherings, &c. The internal lining is of pressed red bricks from Whitwick Colliery, relieved with terra-cotta and Corsham Down stone and occasional detached shafts of red Mansfield stone. The tower is a massive structure in three stages, having a total height to the weather vane of about 100 feet. The situation being exposed, and the tower a prominent object for many miles, the moderate funds available were used in imparting dignity and solidity rather than in ornamentation. Internally the large tower arches add much to the effect. The contractors were Messrs. T. & H. Herbert, of Leicester. Messrs. Smith & Co., of Coalville, executed the tile floor and terra-cotta. The whole of the church has been erected from the designs and under the superintendence of Mr. J. B. Everard, F.R.I.B.A., of Leicester. The total cost of the sacred edifice amounts to 9,000*l.*, including upwards of 3,500*l.* recently expended on the chancel.

**Harrogate.**—The foundation-stone of the New Town Mission Hall, Harrogate, was laid on the 19th inst. The buildings consist of a hall, 48 feet by 32 feet, and 45 feet across transepts, having porch and vestibule, with octagonal tower rising 40 feet, in which is placed stairs to gallery. On lower ground floor are two vestries; the walls are of yellow sandstone to plinth level, with blue wall stones and white dressings above, and red Broseley tiled roofs open to collar, rising to 25 feet, having Boyle's concealed roof ventilators and inlet fresh air flues in buttresses. Accommodation is provided for 350 persons, at a cost of 1,000*l.* Mr. J. Dickenson is the builder, and Mr. T. Butler Wilson, Leeds and Harrogate, the architect.

**GENERAL.**

**The Prince of Wales** has contributed fifty guineas towards the cost of a new Roman Catholic church in Leeds.

**Lord Ripon** has promised to be present at the opening of the Leeds Art Gallery in October next.

**The Northampton Opera House** was sold by auction on Wednesday, for 9,000*l.*, to Mr. Phipps Dorman, a brewer.

**Mr. L. T. Evans**, of the Water Engineer's Department, Liverpool, has been appointed water engineer for Nottingham. There were 130 candidates.

**Mr. A. Carnegie** has given 100*l.* towards the new town hall, Linlithgow.

**Mr. J. S. Crowther**, of Manchester, has prepared plans for the restoration of the ancient parish church of St. Wilfrid, Moberley, between Alderley Edge and Knutsford, and also for rebuilding the tower and restoration of St. Mary's, Lymm.

**The Town Council of Bath** decided on Tuesday that the principal streets of the city are to be lighted by the aid of electricity.

**The Institution of Mechanical Engineers** will hold a meeting in Dublin on Tuesday next and the following days, under the presidency of Mr. E. H. Carbutt. Lord Rosse is president of the reception committee.

CRIMINAL PROCEEDINGS, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment.  
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\* "R.I.B.A. Journal of Proceedings." Vol. i. fol. 29. 1885. New Series. "Revue Générale de l'Architecture." Fourth Series. Vol. xiv. 1887.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, JULY 27, 1888.

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### TENDERS ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

### CONTRACTS OPEN.

AYLESBURY.—Aug. 3.—For Erection of a Post Office. Secretary, H.M. Office of Works, 12 Whitehall Place.

BELFAST.—Aug. 16.—For Erection of Constabulary Barracks at Mount Pollinger. Mr. W. B. Soady, Secretary, Office of Public Works, Dublin.

BIRKDALE.—Aug. 4.—For Erection of Conservative Club. Mr. J. Dod, 16 Exchange Buildings, Liverpool.

BLACKPOOL.—July 27.—For Enlarging Covered Market in Lytham Street. Mr. J. Wolstenholme, Borough Surveyor. Chairman Markets Committee.

CARNARVON.—Aug. 1.—For Alterations to the Cottage Hospital, Broneiont. Mr. R. J. Davids, Architect, Glen Helen, Carnarvon. Mr. G. H. Humphreys, Honorary Secretary, Old Bank, Carnarvon.

CLONMEL, CO. TIPPERARY.—Aug. 9.—For Erection of a Chapel at the Lunatic Asylum. Mr. W. G. Doolin, Architect, 20 Ely Place, Dublin. Secretary, Board of Control, Custom House, Dublin.

DERBY.—Aug. 11.—For Erection of Infectious Diseases Hospital. Mr. R. J. Harrison, Borough Surveyor, Derby. Mr. J. Jones, Clerk, Municipal Offices, Derby.

ILFRACOMBE.—Aug. 7.—For Construction of Impounding Reservoir and other works. Mr. E. Appleton, Architect, Torquay. Mr. F. Brede, Clerk to Local Board.

LEEDS.—Aug. 1.—For Erecting New Heating Apparatus in St. John's Church, Newtown. Messrs. Swale & Mitchell, Architects and Surveyors, 98 Albion Street, Leeds.

LEEDS.—August 3.—For Erection of Wesleyan Chapel Lincoln Fields, Newtown. Mr. G. F. Danby, Architect, 45 Great George Street, Leeds.

LLANELLY.—Aug. 7.—For Erection of Board School for Boys and Girls. Mr. E. H. Lingen Barker, Architect, Hereford. Clerk to Llanelly School Board.

LONDON.—Aug. 1.—For Building Public Baths and Wash-houses for the Vestry of St. George, Hanover Square. Mr. F. J. Smith, Architect, 272 Winchester House, Old Broad Street, E.C.

LONDON.—Aug. 9.—For Additions and Alterations to Work-house, Walworth. Messrs. Jarvis & Sons, Architects, 29 Trinity Square, S.E. Mr. H. C. Jones, Clerk, John Street West, S.E.

LUDLOW.—July 31.—For Erection of Town Hall and Market Hall. Mr. H. A. Cheers, Architect, Twickenham.

LYMM.—July 28.—For Rebuilding Tower of Parish Church. Mr. Crowther, Architect, Hanging Bridge Chambers, Cathedral Yard, Manchester.

NORTHAMPTON.—For Alterations and Additions to the School of Art. Mr. W. Hull, Architect. Mr. J. B. Hensman, Secretary.

SHIBDEN.—Aug. 2.—For Erection of Infirmary Buildings at Industrial School. Mr. J. F. Walsh, Architect, Waterhouse Chambers, Halifax.

TETBURY.—July 31.—For Building Passenger Station, Tetbury, and Additions to Kemble Junction Station. Mr. J. D. Higgins, Secretary, Paddington Station, W.

WHITEHAVEN.—Aug. 1.—For Erection of Vicarage and Stables at Drigg. Mr. T. Lewis Banks, F.R.I.B.A., Architect, 22 Lowther Street, Whitehaven.

### TENDERS.

#### ASHTON-UNDER-LYNE.

For Extension of Premises for the Local Board, Hurst. Mr. JOSEPH HEYS, Surveyor. Quantities by Mr. Heys.	
W. H. Ibberson, Manchester	£920 0 0
Luke Whittaker, Ashton-under-Lyne	695 0 0
Chas. Morris, Ashton-under-Lyne	690 0 0
William Marsden, Ashton-under-Lyne	653 0 0
Allen Holmes, Ashton-under-Lyne	640 0 0
Walter Clough, Ashton-under-Lyne	642 0 0
THOMAS DEAN, Ashton-under-Lyne (accepted)	635 0 0

#### BARNET.

For Construction of 15-inch and 9-inch Pipe Sewers, and Works in connection, in May's Lane and Bell's Hill, for the Barnet Local Board. Mr. MANSBRIDGE, Surveyor.	
Smith & Allen, Reading	£1,889 13 0
J. Cook, Spalding	1,407 0 0
W. Langridge, Croydon	1,350 0 0
T. G. Dunmore, Crouch End	1,321 0 0
H. Hill, High Wycombe	1,319 0 0
G. Osenton, Westerham	1,299 0 0
G. Capper, St. Albans	1,287 9 0
G. Bell, Tottenham	1,216 0 0
G. R. Rackham & Co., Colchester	1,177 0 0
H. Marriott & Co., Winchmore Hill	1,150 0 0
J. Curnow, Barnet	1,080 0 0
W. NICHOLLS, Wood Green (accepted)	1,043 0 0

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For Erection of a Pair of Semi-detached Villas, Bangor, North Wales. Mr. JOHN H. PHILLIPS, Architect, Cardiff.			
William Thomas	£2,450	0	0
W. & C. Pritchard	2,222	0	0
Robert Williams	2,187	0	0
R. & J. Williams	2,163	0	0
Evan Jones	2,000	0	0
Evan Williams	1,866	0	0
LEWIS PARRY, Llangefni (accepted)	1,659	0	0

**BEDFORD.**

For Erection of Four Cottages and Stabling in Clapham Road. Mr. H. YOUNG, Architect, Bedford.			
W. Haynes	£990	0	0
G. Harrison	935	0	0
T. Spenser	880	0	0
Wharton & Walker	872	0	0
J. P. White	853	0	0
J. Corby & Son	839	10	0
Melcombe Bros.	837	0	0

**BRIDLINGTON QUAY.**

For Erection of New Shop and Photographic Studio on Esplanade. Mr. R. RAILSTON BROWN, Architect, Bridlington Quay.			
J. Rennard	£425	0	0
T. GRAY, Bridlington Quay (accepted)	308	10	0

**BROMLEY.**

For Erection of a Residence, Lodge, and Stabling, for Mr. A. Gurney Smith, at Bromley, Kent. Mr. H. PERCY MONCKTON, F.R.I.B.A., Architect, 32 Walbrook, E.C.			
Quantities by Messrs. Drower & Ruault, 17 Southampton Street, W.C.			

*House.*

Higgs & Hill, London	£2,828	0	0
Douglas Payne, Bromley	2,743	8	2
Turtle & Appleton, Wandsworth	2,675	0	0
Holliday & Greenwood, Brixton	2,659	0	0
T. Crossley, Bromley	2,650	0	0
Maides & Harper, Croydon	2,618	0	0
W. J. Smith & Co., London	2,575	0	0
J. Smith & Sons, South Norwood	2,575	0	0
W. Wiltshire, Sevenoaks	2,525	0	0
Taylor & Sons, Bromley	2,499	0	0
E. A. ROOME, Clapton (accepted)	2,452	0	0

*Conservatory.*

Holliday & Greenwood	£212	0	0
Higgs & Hill	144	0	0
Turtle & Appleton	140	0	0
W. J. Smith & Co.	140	0	0
T. Crossley	135	0	0
J. Smith & Sons	135	0	0
W. Wiltshire	135	0	0
Douglas Payne	134	8	8
Maides & Harper	134	0	0
Taylor & Sons	131	0	0
E. A. ROOME (accepted)	130	10	0

*Lodge.*

Douglas Payne	226	15	10
Higgs & Hill	222	0	0
Turtle & Appleton	212	0	0
Maides & Harper	208	0	0
W. J. Smith & Co.	204	0	0
T. Crossley	203	0	0
J. Smith & Son	198	0	0
Taylor & Sons	197	0	0
E. A. ROOME (accepted)	189	0	0
W. Wiltshire	185	0	0
Holliday & Greenwood	137	0	0

*Stables.*

Higgs & Hill	796	0	0
Douglas Payne	790	9	8
Turtle & Appleton	773	0	0
Holliday & Greenwood	769	0	0
T. Crossley	753	0	0
W. J. Smith & Co.	750	0	0
J. Smith & Sons	747	0	0
Maides & Harper	726	0	0
Taylor & Sons	713	0	0
E. A. ROOME (accepted)	707	10	0
W. Wiltshire	700	0	0

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For Additions, &c., to Four Houses in Eclipse Street, and Three in Planet Street, Roath. Mr. W. H. DASHWOOD CAPLE, Architect, Queen Street.			
J. HOPKINS, Roath (accepted).			
For Sanitary Work, &c., including the Laying of New Drainage throughout to Two Villas in Partridge Road, Roath. Mr. W. H. DASHWOOD CAPLE, Architect, Queen Street.			
J. HOPKINS, Roath (accepted).			

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HOCKLEY, Grantham (accepted) . . . . .	935	0	0

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G. Wagg, Derby . . . . .	2,400	0	0
DURANT (accepted) . . . . .	2,386	0	0

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For Erection of New Wesleyan Memorial Chapel, Epworth. Mr. CHARLES BELL, F.R.I.B.A., Architect. Quantities not supplied.			
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Baines, Newark . . . . .	2,996	0	0
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Wright, Lincoln . . . . .	2,800	0	0
KELSEY, Epworth * . . . . .	2,749	0	0
Holmes & Horton, Wainfleet . . . . .	2,745	0	0

\* Accepted, Ancaster stone dressings and pitch pine for roof and joinery being included.

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For Two Houses and Shops in Soule Street, for Mr. George Trimmer. Mr. SIDNEY STAPLEY, Architect.			
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Tompsett & Kingham . . . . .	1,370	0	0
Hughes, Aldershot . . . . .	1,248	0	0
Parratt, Farnham . . . . .	1,228	0	0
DIAMOND, Farnham (accepted) . . . . .	1,180	0	0

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For Alterations to Closets and Drainage at the National Schools, for the School Committee. Mr. SIDNEY STAPLEY, Architect.			
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Tompsett & Kingham . . . . .	120	0	0
Goddard & Sons . . . . .	112	0	0
DIAMOND (accepted) . . . . .	108	0	0

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Spink, Heckington . . . . .	£581	0	0
Clark, Boston . . . . .	549	5	8
Parker & Hind, Boston . . . . .	540	0	0
Batsman, Sutton Bridge . . . . .	477	14	0
Smith, Culverthorpe . . . . .	468	10	0
Greenfield, Boston . . . . .	456	15	0
Banks & Peak, Sleaford . . . . .	455	0	0
Leape, Boston . . . . .	441	0	0
HOCKLEY, Grantham (accepted) . . . . .	439	0	0
S. & R. Horton, Lincoln . . . . .	350	0	0

## GREENWICH.

For Building Pavilion and Additions to Infirmary, Greenwich, for the Guardians. Mr. THOMAS DINWIDDY, of Basinghall Place, E.C., and Greenwich, Architect. Quantities by Mr. Farthing.			
Lascelles & Co., Bunhill Row . . . . .	£24,687	0	0
Knight, Sidcup . . . . .	24,307	0	0
Wallis & Son, Maidstone . . . . .	24,150	0	0
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Downs, Walworth Road . . . . .	23,630	0	0
Rider & Son, Borough . . . . .	23,530	0	0
Scholfield, Deptford . . . . .	23,283	0	0
T. Martin, Maidenhead . . . . .	23,000	0	0
J. Morter, Stratford . . . . .	22,934	0	0
Deacon & Co., Lower Norwood . . . . .	22,793	0	0
Bunning & Son, Camberwell . . . . .	22,621	0	0
Stimpson & Co., London . . . . .	22,600	0	0
Kilby & Gayford, Worship Street . . . . .	22,582	0	0
Parker . . . . .	22,479	0	0
Jerrard, Lewisham . . . . .	22,467	0	0
Kirk & Randall, Woolwich . . . . .	22,230	0	0
Balaam Bros., Old Kent Road . . . . .	22,222	0	0
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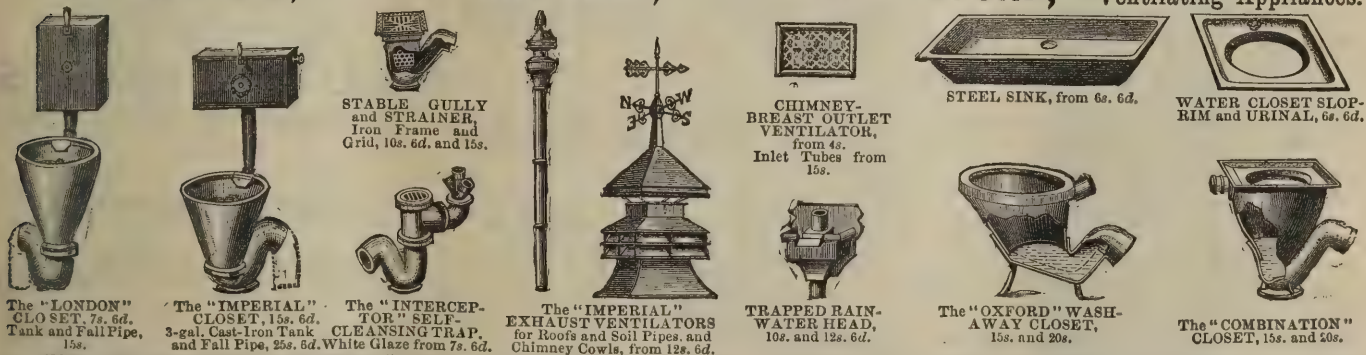
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Hockley, Grantham	£600 0 0
Wartnaby & Son, Grantham	550 0 0
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PRIEST BROS., Grantham (accepted)	495 0 0

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J. Grisbrook & Co., Hastings	129 10 7
J. & C. Bovis, Hastings	122 0 0
A. Vidler, Hastings	198 0 0

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F. Sage & Co.	271 0 0
DREW & CADMAN (accepted)	234 0 0
For Alterations and Additions to St. John's Hospital for Diseases of the Skin, Leicester Square, W.C. Mr. EDWARD CLARK, Architect, 432 West Strand, W.C.	
J. Hocking	£275 0 0
T. L. Green	253 0 0
Patman & Fotheringham	235 0 0
Jackson & Todd	220 0 0
John Anley	209 0 0

## LONDON—continued.

For Erection of St. George's Presbyterian Church, Willesden Lane, N.W. Mr. HENRY S. TYACK, Architect, 6 Duke Street, Adelphi, W.C.	
Patman & Fotheringham	£4,800 0 0
J. C. Tennant, Willesden	4,300 0 0
Wall Bros., Kentish Town	4,249 0 0
J. Woodward, Finsbury	3,943 0 0
R. A. Lowe, Chislehurst	3,717 0 0
J. ALLEN & SONS, Kilburn (accepted)	3,465 0 0
For Enlargement of Schools and New Caretaker's Cottage at Loughborough Park Chapel, Loughborough Junction. Messrs. W. G. HABERSHON & FAWCKNER, Architects.	
Higgs	£1,328 0 0
Whitehead	1,297 0 0
Creed	1,277 0 0
Hooper	1,234 0 0
Maides & Harper	1,112 0 0
Groom	1,097 0 0
Castle	1,070 0 0
Gregory	1,055 0 0
Gregar	1,037 0 0
For Pulling Down and Rebuilding No. 453 Hackney Road, and for Work to Nos. 449, 451, 457, and 459 Hackney Road. Mr. GEORGE CHUTER, Architect.	
F. & F. J. Wood	£1,486 0 0
Laughton	1,324 10 0
Winkley	1,302 0 0
G. W. Beale	1,235 0 0
Wetherilt, Lee & Martin	1,223 0 0
THOMERSON & SON (accepted)	1,199 0 0
For Painting and other Work, at the Infirmary, Harrow Road, for the Guardians of Paddington. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities not supplied.	
Dixon & Dowse	£510 7 6
W. H. Lesser	380 0 0
Kirby & Chase	370 0 0
F. G. Pinn	364 8 0
T. Maling	345 10 0
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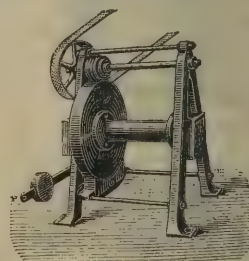
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Tomes & Wimpey	190	0	0
W. G. Coat	187	0	0
J. MEARS (accepted)	177	0	0
Trehearne	176	0	0

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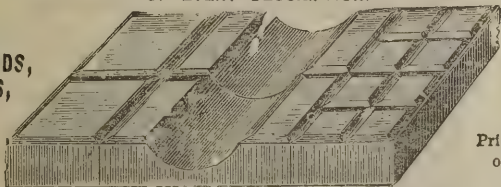
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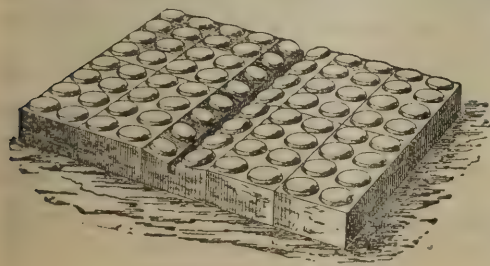
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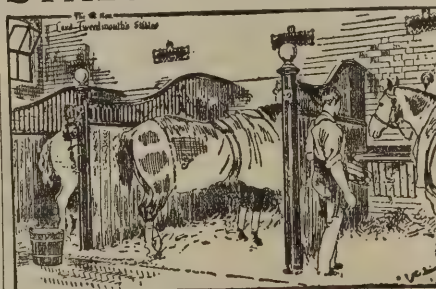
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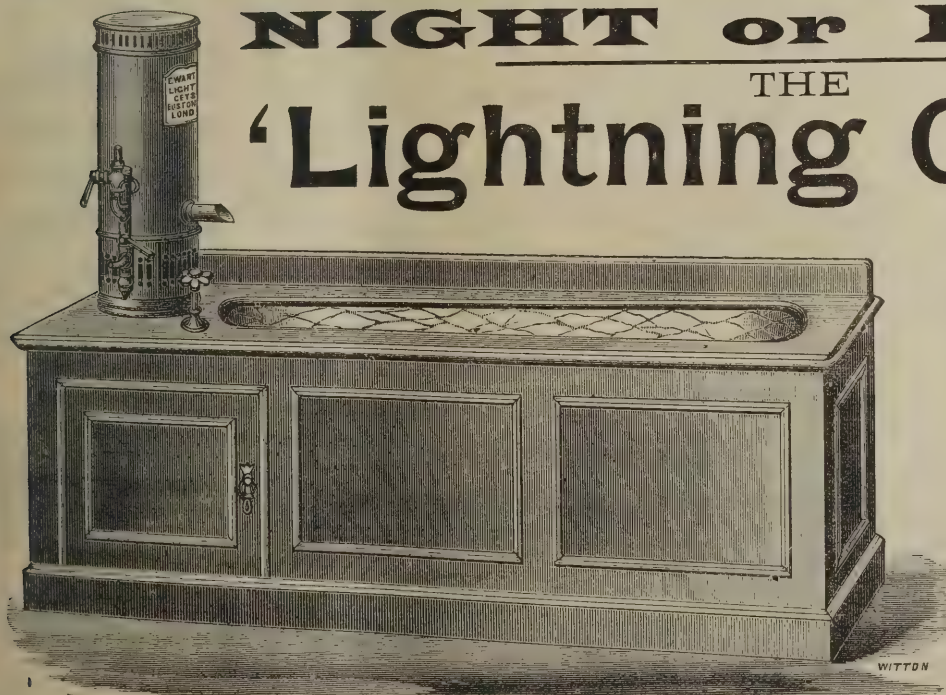
ON Sunday morning, July 22, a very large chiming clock was started in St. Peter's Church, Hindley, near Wigan, by the Rev. Peter Jones, the first vicar of the church, who came purposely for the ceremony. The clock has four dials, each 6 feet across, of very chaste but simple design. The quarters are chimed upon four bells, and the hours struck upon the largest bell in the tower. The movement is constructed with every modern improvement, so as to maintain perfect accuracy, and chiefly to the designs of Lord Grimthorpe. It has a gravity escapement, with a compensated pendulum. The whole of the work has been carried out by Messrs. J. Smith & Sons, Midland Clock Works, Derby, who have also in hand a similar but somewhat larger clock for Rawtenstall Church, Lancashire.

MR. E. H. SHORLAND, of Manchester and London, has recently supplied his inlet and outlet ventilators, amongst other places, to the following:—Fire Brigade Station, Oldham; New Wesleyan Chapel and Schools, Watersheddings, Oldham; and the Methodist Free Church Schools, Oldham—Messrs. Potts, Pickup & Dixon being the architects for the whole of same.

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SIG. G. FOCARDI, the sculptor of *You Dirty Boy*, has just executed a bust of Mr. John R. Whitley, the Director-General of the Italian Exhibition. It is a most speaking likeness, and is now on view in the vestibule of the main building, having been cast in plaster-of-Paris. The artist used nearly a ton of clay in making his model. Sig. Focardi's other pieces on view in the Italian Exhibition include *Happy Age*, *You Raganuffins*, *Daddy's Clothes*, *Sweet Rest*, and *Allegro*. In the present Exhibition there are upwards of 500 different pieces of sculpture.

THE directors of Messrs. Perry & Co., Limited, have resolved to pay on September 1, out of profits, an interim dividend on the ordinary shares for the first six months of this year at the rate of 6 per cent. per annum, free of income-tax, being at the same rate as for the corresponding period last year. The half-yearly dividend on the preference shares will be paid as usual at the fixed rate of 5 per cent. per annum.

COLLINGS'S PATENT BOLTS AND HINGES are well known to most of our readers, as, also, is the fact that Mr. C. E. Hornor, of 120½ Southwark Street, S.E., has for many years been the successor in Mr. Collinge's business. It is about seventy years ago that these patents originated, and ever since there has been a demand for them, a result attained mainly by architects specifying his bolts and hinges for villa gates, park gates, and door fittings, &c. There is scarcely any kind or size not in stock. Although invented so many years ago, there is nothing in the present day to excel the patent bolts and hinges for simplicity, ease of working, and security. A visit to the showrooms, 120½ Southwark Street, will demonstrate both the variety and the high excellence of manufacture.

#### A GREAT GYPSUM QUARRY.

THE opening of the new quarry in the east end of the Cocklakes bed of alabaster, belonging to Messrs. John Howe & Co., is approaching completion, and probably the finest head of alabaster ever seen in this country is now uncovered. The working out of the above bed has practically taken five years,

the works comprising a tunnel through the alabaster 411 yards long, along which it is proposed to run the locomotive, the stuff being hewn in galleries running into the same. In the old quarry this gives, together with the open space, a working face of nearly 600 yards, the bed being about 25 feet thick. The new quarry is to be worked open from east to west, the alabaster being continuous between the two quarries. Architects or contractors desirous of viewing the formation will be shown over upon application at any time.

#### RESPONSIBILITY FOR STATE OF DRAINS.

THE case of *Butler v. Goundry* came again before the Courts on Wednesday in the form of an appeal on the part of the plaintiff from the Court below. The action is to recover damages for misrepresentation as to the drains of a house, No. 148 Brompton Road, which the plaintiff took on lease from the defendant. In March 1887, the plaintiff met the defendant at the house and went over it, and the plaintiff in his evidence said that the defendant told him that he, the defendant, had spent 200*l.* upon the house, 50*l.* of which was for the drains, that he believed the house was the best drained house in Brompton Road, and that the drains were taken up about a year and a half ago and put in order. The plaintiff made particular inquiries about the drains, as he had suffered from typhoid fever. Upon July 4 the plaintiff went into the house, and soon afterwards he, his wife, and his servant were attacked by symptoms of typhoid fever. The sanitary inspector was called in, when he found that the drains, which were brick drains, were very defective, and that the soil leaked through and soaked into the ground. The plaintiff was obliged to leave the house and have the drains put into repair. The defendant's case was that he went into the house two years before, that he and his family lived there in good health, as did also the occupiers before him, that the drains were flushed and opened and repaired by a builder a year and a half before the plaintiff took the house, and that he told the plaintiff that he believed the drains, for old brick drains, were in good order, and that they did their work well while he was in the house, and that therefore he had reasonable grounds for believing, and did believe, that the drains were in good order. The case was tried before Mr. Justice Mathew, when the jury found for the defendant. The

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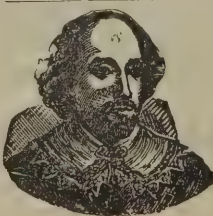


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Divisional Court (Mr. Baron Huddleston and Mr. Justice Charles) refused a new trial. Hence the plaintiff appealed.

Counsel for the plaintiff asked for a new trial on the grounds of misdirection, and that the verdict was against the weight of evidence. It was argued that Mr. Justice Mathew really directed the jury that the question was whether the defendant intended to cheat the plaintiff. There was no charge of actual fraud against the defendant. The true question was whether or not the defendant had reasonable grounds for supposing his representation to be true. In this case the judge did not put that question properly before the jury. They referred to *Peek v. Derry* (37 Ch. D. 541).

Counsel for the defendant were not called upon.

The Court dismissed the appeal.

Lord Justice Lindley said that the summing up was perhaps addressed a little too exclusively to the fraudulent aspect of the case. But the Court had to consider whether there was substantially a misdirection, and whether if there was it affected the result of the case. The judge called the jury's attention to the law laid down in *Peek v. Derry*. The defendant, it was clear, did make some statement that the drains were in good order. It seemed that the drains had been opened a year and a half previously, and an obstruction was cleared away and the drains flushed. The drains were then closed, and there was no sign of anything wrong. It was impossible to say that the defendant made this statement without reasonable ground for believing it to be true. The statement was, in fact, untrue, but it was honestly made. He did not think that there was any substantial misdirection, though the direction fell short of what was desirable; but, even if there were, in his opinion no object would be gained by sending the case down for a new trial.

Lord Justice Bowen concurred.

#### STEEL IN FOUNDATIONS.

THE use of steel rails for the foundations of large buildings has long been followed in the spongy soil of Chicago. Some of the more recent large structures have combined the use of steel beams with rails, notably the Edison Electric Light Company's building and the great auditorium in which the National Republican Convention has just been held. The Tacoma building, now being erected on the corner of Madison and La Salle Streets, under the direction of Holabird & Roche, architects, is the first to use steel beams exclusively for foundations.

This building will be twelve storeys and an attic in height, and is intended for offices. Its walls will therefore be very massive, and the partitions will be supported on large pillars built up from the ground. The foundations for the walls and pillars consist, first, of a bed of concrete 2 feet thick; second, of steel I-beams, of different dimensions, according to circumstances, crossed wherever necessary; and third, of cast-iron plates in the case of the columns. The beams stand on edge, are placed close together, and are long enough to extend from 6 to 7 feet outside of the columns. They are enveloped in concrete after being placed in position, to guard against oxidation, and also to secure further rigidity. Over 120 tons of steel beams will be required for the foundations alone of this building. They were adopted in preference to steel rails, because their aggregate cost is about one-third less, as several tiers of steel rails would have to be used to secure the stiffness of the beams, thus more than covering the difference in the cost per ton.

#### RAILWAY BRIDGES IN DUBLIN.

At the meeting of the Dublin Corporation on Monday, letters were read from the Dublin, Wicklow, and Wexford Railway Company, relative to the difference which has arisen with the Corporation as to the plans for the viaduct across Beresford Place, suggesting that the matters in dispute be referred to Mr. B. B. Stoney, C.E., and requesting a reply by the 25th inst., failing which the company will take it that the Corporation object, and the company will at once apply to the Board of Trade to appoint an engineer.

Mr. Robinson, architect, said that as one of the committee appointed in this matter, he wished to say that he believed the railway company had not treated the committee fairly. The general design of the bridge was objected to. In regard to the suggestion to appoint Mr. Stoney, that gentleman was beyond doubt an engineer of great ability, but owing to his connection with the Dublin Port and Docks Board, which to a certain extent had favoured the Loop Line, and the members of which were to a certain extent identical to members of the two railways, he would suggest that Mr. Cotton, engineer to the Board of Trade, or Mr. Strype should be appointed.

Mr. Dillon described the design as patchwork, and said it was wholly unsuitable. It was an outrage on the city for the railway company to propose such a hideous structure. He would suggest that the matter be left to the Board of Trade.

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Alderman Winstanley objected to the design, but was willing to leave the matter to the Board of Trade.

Sir George Owens said that there was not a man of higher reputation in the city than Mr. Stoney, and he believed he would be incapable of being influenced by any sinister motive.

Mr. Doherty said that an engineering matter he would willingly leave to Mr. Stoney, but, seeing that he was the engineer who advised the Port and Docks Board not to accede to the request of this Corporation to have the bridge taken on the other side of the Custom House, he believed it would be wrong to place him in the invidious position of being arbitrator between the Port and Docks Board, the railway company, and the Corporation.

Sir George Moyers had no objection to the appointment of Mr. Strype, though he thought the matter should go to the Board of Trade. The bridge was made of lattice-work, and was ornamented with shamrocks and pike heads.

Mr. Robinson proposed that Mr. Strype be suggested as arbitrator. There should be no advertisements on the bridge.

Alderman Dillon said that the company was bound to put up an ornamental structure, and could not put advertisements upon it.

Mr. Robinson's resolution to suggest Mr. Strype was adopted.

#### LICHFIELD CATHEDRAL.

THE Dean of Lichfield appeals for aid towards the restoration of the lady chapel, which is now making good progress. The work is tedious and costly in consequence of the dilapidated condition of the structure, patched up as it has been from time to time with curious and clumsy applications of Roman cement. Moreover, the great ornamental feature of the lady chapel, the stained glass of the sixteenth century, brought over by the late Sir Brooke Boothby to this country from the Abbey of Herckenrode, near Liège, at the beginning of the present century, and presented by him on most generous terms to the Dean and Chapter of that day, is in a very insecure condition, in consequence of the perishing state of the leadwork which holds it together. Hence it has been necessary for the sake of this precious glass, as well as for the thorough repair of the mullions, carefully to take down these windows, one by one, and re-lead them, an operation requiring great care and patience. Three of these windows have already been re-leaded

and replaced, and a fourth is now nearly completed. Externally the windows of the lady chapel are separated by buttresses of excellent proportions, the whole work being originally of the Late Decorated period. Each of these buttresses carries two niches, and it is a part of the design of the Dean and Chapter to fill all these niches, as the work proceeds, with figures of female saints of the Old and New Testaments, each buttress carrying an Old Testament saint in the upper niche and a New Testament saint in the lower. Two of the buttresses on the south side are already restored, and their niches occupied respectively with figures of Rachel and Phœbe and Miriam and Lydia. Two more figures, those of Deborah and Martha, will shortly be in their niches. But there still remain ten more niches for which figures will be needed; and it is earnestly hoped that contributions will be made towards this object by those who admire the cathedral of Lichfield, and appreciate what has been done within the last half century for its restoration. The estimated cost of each figure is 30*l.*, and amongst those which will next be wanting are the figures of Rebecca and Elizabeth, Rizpah and Mary (the sister of Lazarus), Ruth and Anna.

#### REGISTRATION OF PLUMBERS.

A PUBLIC meeting was held on Monday in the lecture-hall of the Free Library, Liverpool, to consider the registration of qualified plumbers as a measure for securing the higher efficiency of plumbers' craftsmanship. Mr. J. B. Smith, the chairman of the Health Committee, presided, and the building was filled in every part.

The Chairman, in explaining that the meeting had been convened under the guidance of the National Worshipful Company of Plumbers, said its object was to enable the public to distinguish between qualified and unqualified plumbers. A householder might employ a man who called himself a plumber, and who might be ignorant of his business, and it was therefore desirable that means should be found to enable anybody wishing to engage a plumber to procure a qualified and efficient one. This registration movement affected the Health and Water Committee of the Liverpool City Council, and as chairman of the first-named body he wished to express the desire of his colleagues as well as himself to see the present system improved. The question mainly affected the drainage,

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and here he might say Liverpool had not been behindhand in sanitary reform. The city was the first in the kingdom to go in for a private Act to remedy sanitary defects, and one result had been the abolition of the old midden and cesspool system in favour of water-closets. But unless drain-pipes were properly constructed and soil-pipes properly placed, ventilated and trapped, water-closets were a source of danger. The Health Committee for that reason were anxious to see the best plumbers employed. They wanted plumbers not only to work with their hands, but with their heads; and when they went to a house to correct one fault it was undesirable they should leave another. While there might be many ignorant plumbers he was quite sure there were many honest and capable ones, and what was required now was to make plumbers as a body thoroughly efficient.

Dr. J. Stopford Taylor was of opinion that the work in which they were engaged was one of a most valuable character, and one that would conduce very materially to the public health. It was the unanimous opinion of medical men that the registration of plumbers should become general and universal throughout the whole country. Speaking for himself, having now been connected with the Health Committee for nearly a quarter of a century, he might say that while he had seen a great amount of good plumbing, he had also seen a large amount of defective work, which had produced much discomfort and, in many cases, death. With such evidence the medical profession had unanimously adopted the sentiment that the registration of plumbers was absolutely necessary and essential for the public health. There were several reasons to account for the bad plumbing that was done, and it might be one reason was that there had been an increase in the system of competition for contracts. In all estimates for the erection or repair of buildings, he held that none but registered plumbers should be employed. He did not want to see a man one day whitewashing the ceiling, the second day hanging up the paper, the third day brushing the wall, and the fourth day tinkering with the water-closet. Those were the men who promoted sickness amongst the public at large, and brought discredit on the whole plumbing trade. It was for that reason he appreciated very highly the action of the plumbers in visiting Liverpool to form a council where plumbers could be taught their technical business, and instructed in those sanitary measures which it was their duty to carry out by fair and honest work. He moved:—"That this meeting of master and operative plumbers and others of the North of England, having

heard the statement as to the action of the Worshipful Company of Plumbers, London, with the view of bringing about a national system of registration of plumbers, resolves (1) that a district council for Liverpool, Birkenhead, West Lancashire, Cheshire, Denbigh, Flint, Carnarvon, and Anglesey, in union with the London Plumbers' Company, be formed to carry out such a system for that district; (2) that the said district council shall consist of representatives from the master plumbers, the operatives, and the public."

Mr. Henry Duckworth, in seconding, afforded an illustration of the impetus which the Liverpool School of Science was giving to the movement, and stated that his association would continue to do all it could to elevate and assist the plumbing trade. The motion was supported by

Mr. Malcolm Guthrie, who submitted that there was no worse economy than bad plumbing. There were some kinds of work which a householder could see were done badly or well, but plumbing was out of sight in most places, and the results of it were not so manifest.

The resolution was carried with one dissentient.

A district council was then formed and representatives selected from the master plumbers, on the proposition of Mr. T. H. Milne, seconded by Mr. Anderton; from the operatives, on the motion of Mr. A. White, jun., seconded by Mr. G. H. Morton; and from the public at the instance of Dr. Carter, seconded by Dr. Vacher. The new council, on the resolution of Dr. Steeves, seconded by Mr. Coard S. Pain, were afterwards empowered to frame rules to carry on the movement.

#### ARTESIAN WELL-BORING.

At Headly Park, near Liphook, Hants, the residence of Mr R. S. Wright, an overflowing artesian spring has recently been tapped by a tube well bored by Messrs. Le Grand & Sutcliffe, of London. The water rises from a bed of lower greensand underlying the gault clay, and overflows at 9 feet above the surface at an altitude of 210 feet above O.D. At first the overflow was at the rate of about 200 tons of water a day, but as the spring developed itself the quantity increased to 290 tons per diem; and upon the tube being cut down 2½ feet the overflow has further increased to no less than 480 tons, or 110,000 gallons daily, which would be equal to supplying a population of 4,400. The water, which has been analysed by Dr. Tidy

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#### BUILDING BY-LAWS.

A CASE has been tried in Manchester, before Mr. Justice Stephen, in which the Corporation of Bury were the defendants. It related to the interpretation put upon the local by-laws. The plaintiff, Mr. Joseph Newbold, is a large owner of property in Bury, and he, in March of last year, sent into the Bury Corporation plans of five houses and shops he proposed to build in Stanley Street. The plans came before the plans committee and the paving, sewerage, and streets committee of the Corporation. They were finally disapproved as not being in accordance with the by-laws, and notice of such disapproval was sent by the borough surveyor to Mr. Nuttall, Mr. Newbold's architect. Mr. Nuttall submitted an alternative plan, which, however, the Corporation could not approve. The plaintiff, believing that he was right as to his plans, proceeded with his buildings. The Corporation extended the time within which the plaintiff should make the necessary alterations, but he did not make them, and the defendants alleged that they had no alternative but to go in and pull down portions of the back of the premises, which, they said, constituted the infringement of the by-laws. The by-law provided that buildings used as dwelling-houses should have in the rear or at the side a properly enclosed yard, exclusively belonging thereto, to the extent of at least 150 square feet, free from any erection thereon above the level of the ground, and that the distance between every such building and the opposite property at the rear or side should be 20 feet. Parties were agreed as to the point from which they were to measure in providing this required space, and the difficulty between them was as to the point at the other end to which they were to measure—in other words, what was "the opposite property." It appeared that behind the houses in question there was another piece of land belonging to the plaintiff, and Mr. Ambrose contended that the words "opposite property" meant the property of some other person.—Mr. Bigham, for the Corporation, argued that the by-law did not mean that the opposite property must belong to some other owner, but it meant that the yard, with the wall at the end of it, should be 20 feet long, and that there should be 20 feet of open space between it and

the opposite property. The property to which they were to measure was the property that abutted upon the yard wall, never mind to whom it belonged.—Mr. Nuttall, architect, was called, and said he did not receive a letter from the borough surveyor of Bury stating the grounds of objection to the passing of the plans, although the copy-letter book being produced, he did not doubt that the letter was written.—Mr. Ambrose said the plaintiff's statement of claim stated that the property was taken down negligently.—The Judge said that was a question of damage, and could not affect the question of right.—Mr. Bigham said that if the buildings had been taken down carelessly, and damage had been done thereby, the defendants were liable for that, whether they were within their right or not. That point, he understood, was referred with the question of damages.—The Judge said he thought there was an order disapproving of the proposed buildings, and also that Mr. Nuttall must have received notice of that disapproval, although he might probably have forgotten it. The whole question turned upon the by-law, and he thought the plaintiff should comply with that by-law. Judgment would be entered for the defendants.

#### FLOATING STEAM FIRE-ENGINE.

A COMPLETE self-propelling floating steam fire-engine, constructed by Messrs. Shand, Mason & Co., of London, for the port of Buenos Ayres, has just been shipped on board the *Asiatic Prince*, South-West India Dock. The vessel, which is named after the President of the Argentine Republic, the *Presidente Juarez Celman*, was tested by Captain Shaw, C.B., chief officer of the Metropolitan Fire Brigade, on the 4th instant, when its speed compared favourably with that of the *Arrow*, one of the swiftest launches belonging to the brigade, and at the measured mile its actual rate was found to be over eleven miles an hour. It is 60 feet in length and 11 feet across the beam, and is propelled by means of two inverted steam-engines working direct on the screw shaft. The steam fire-engine is capable of delivering 1,450 gallons per minute, and the boiler of raising steam to full working pressure from cold water in about eight minutes. There are two cabins, the forward one being fitted for the accommodation of three officers, and the after one for eight men. The *Presidente* is built on the same lines as a floating steam fire-engine constructed by Messrs. Shand, Mason & Co. in 1882 for the Brazilian Government for

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(Signed) WILLIAM WHITELEY.



Rio de Janeiro, and it is in consequence of the successful use of the latter that the boat described, which is larger and with more powerful engines, has been built. The Metropolitan Fire Brigade have four fire rafts fitted with exactly similar engines, but of smaller size. For shipment the machinery was taken out of the vessel, and packed in separate cases, the hull going out in one piece, so that on arrival at its destination the whole may be readily fitted together again.

#### SEA-SICKNESS PREVENTED.

A CLEVER and simple invention, that bids fair to be thoroughly efficacious in the prevention of sea-sickness, is now being exhibited at the Italian Exhibition by the inventor, Signor Dom. Valli, of Bergamo. M. Valli suspends a chair or couch to the ceiling of the ship, and the fixed centre of gravity is maintained by means of a ball swivel-joint, so that the equilibrium of the chair is always maintained, no matter how much the vessel may pitch or roll. The inventor subjects his system to severe rocking tests, imitating the action of a ship at sea, and the passenger or experimenter seated in the chair remains perfectly quiescent. Those who are concerned in the fitting out of sea-going vessels would do well to inspect this simple, and as far as we can judge effective, remedy against the nauseous horrors of *mal de mer*. The great recommendation of the plan is its simplicity, as the invention is based on a well-known natural law.

#### WATER OF LEITH PURIFICATION SCHEME.

A MEETING of the joint committee of the Town Councils of Edinburgh and Leith was held on Friday last in the Council Chamber to receive the report of the sub-committee on the Water of Leith Purification Scheme. The committee recommended generally the adoption of No. 3 plan, which provides for the effectual drainage of the whole district of Edinburgh and Leith from Coltbridge to the sea, at a cost of between 50,000*l.* and 60,000*l.*, exclusive of compensation. Further, that in order to provide for the drainage of the landward district above Coltbridge, the culvert will require to be made 3 inches larger, at a cost of 5,000*l.* The sub-committee also recommended that Messrs. D. & T. Stevenson be retained as consulting engineers for the scheme. In regard to the alleged

pollution of the Water of Leith above Coltbridge, and with regard to the action now pending in the Courts, the committee instructed that a communication enclosing the report of the engineers and relative plan be sent to manufacturers, local authorities, and others interested. Without prejudice to the pending action, it was proposed to ask them if they had any suggestions or proposals to make on the matter. The report referred to will be laid before the corporations as soon as convenient, and a remit will be asked to the joint committee to prepare Parliamentary plans and notices giving effect to the same.

#### DINNER TO MASTER BUILDERS IN LIVERPOOL.

THE Master Builders' Association of Liverpool, on Wednesday, entertained at a banquet at the North-Western Hotel, Lime Street, a company of representative members of the National Association of Master Builders of Great Britain, who are at present in Liverpool in connection with a visit to the Manchester Ship Canal Works at Eastham. Mr. C. N. Green, president of the Liverpool Association, occupied the chair, and among the numerous company who sat down were Mr. George Burt (president of the Institute of Builders of Great Britain), Colonel Stanley G. Bird (London), Mr. R. Neill (president of the National Association), Mr. Edmund Kirby (president of the Liverpool Architectural Society), and Messrs. Southern, Brown, and Darmburg (Manchester), Bowen, Sapcote, Barnsley (Birmingham), Bradney (Wolverhampton), Moulson, Houldsworth (Bradford), G. Cowlin, Church, Brock (Bristol), Jones, Holmes, White, T. Tomkinson, T. Jones, G. Atkin (Liverpool), J. Storrs, Turner (Ashton), Crutchley, Townson, Briscoe (Bolton).

After dinner the loyal toasts were drunk.

The Chairman next proposed "The Army, Navy, and Reserve Forces."

Colonel Stanley G. Bird, in responding, said he was glad to hear that the matter of national defence was exercising the minds of the people of Liverpool. National defence was a matter of such supreme importance that one day we would wake up to find we had been awful fools not to have listened to those who told us what we had to expect. As regarded the defences of Liverpool, he hoped the public of the city would not be satisfied until their splendid port was protected against attack.

## THE FIRE AT THE GRAND THEATRE.

The destruction of this fine Building might have been PREVENTED by the USE of GRIFFITHS' "PYRODENE," which would have made the WHOLE of the SCENERY, STAGE, and its SURROUNDINGS—in fact, THE THEATRE in every part—ABSOLUTELY NON-INFLAMMABLE.

### GRIFFITHS' "PYRODENE" FIREPROOFING LIQUID

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Griffiths' Liquid penetrates the pores of the wood. It lasts as long as the wood itself. It prevents Dry Rot and decay in house timbers. It does not crack, peel, or rub off.

It is perfectly innocuous and free from smell. It will keep any length of time. Any one can apply it. One gallon will cover double that of any other priming.

All Woodwork in new houses should be fireproofed with this liquid, the cost is so trifling in comparison with the preservation of the timber and freedom from risk of fire. If work is desired to be painted afterwards, Griffiths' Pyrodene Paint is best for the purpose.

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#### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 2<sup>d</sup>, 1887.

DEAR SIR.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co, Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 32 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIR.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly, S. C. LOWE & SON.

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The "Architects, Surveyors, and Engineers" was proposed by Mr. George Burt, and responded to Mr. Kirby, who personally and as an architect expressed himself exceedingly pleased to meet the visitors.

Mr. Edward Manisty, one of the engineers of the Ship Canal, also acknowledged the toast. Speaking of the Canal scheme, he said the indomitable pluck that had been shown by the Manchester men in carrying their Bill through Parliament, the great skill displayed by their engineer in drawing up his plans, and the extraordinary organising power of the contractor would all be appreciated by the Association in their visit to the works, and would enable them to form some opinion on the prospects of the scheme. No doubt in all such undertakings there would be great and unexpected difficulties, but when they bore in mind who were the men at the head of the scheme, and when they saw what a few months' work had done, they would agree with him that there was every prospect of the promoters standing alongside their docks in Manchester and seeing the big ocean steamers coming in. He was speaking, not to commercial men, but to builders, architects, and engineers, who had no animus, but looked upon the matter as a gigantic scheme, that would enable England to keep her position as the foremost nation in the manufacturing world. Anything that would enable her to do that would command the sympathy of all present. The canal would be larger than any yet constructed, would be 120 feet wide at the bottom, and would have 25 feet depth of water all the way to Manchester. They believed it to be the beginning of an enormous amount of work for engineers and contractors all over the world.

"The Visitors" was proposed by Mr. A. G. White, and responded to by Mr. Robert Dennett, of Nottingham.

The Chairman, amidst applause, gave "The National Association of Master Builders." They looked upon that Association, he remarked, as the head of their provisional associations. They submitted to it all matters of moment connected with the building trade, and had always received its cordial co-operation and kind advice.

Mr. Neill, in responding, after thanking the Liverpool Association for their hospitality, said the National Association, although they existed for themselves first, and for the public afterwards, were proud to think that they did a great work. They were the largest labour-employing community in the kingdom. The building trade had more to do with labour generally throughout the kingdom than any other industry, and this was a fact that the country should recognise. Alluding to

the remarks of Mr. Kirby, he thought that between architects and builders there ought to be no antagonism, and if the architect were a gentleman, as most architects were, he wanted the work well done, and would pay a decent price for it, but when they trusted themselves implicitly to him he would see that they got value for what they gave. He thought he was right in saying that as a rule architects treated them fairly and well.

The concluding toast, "The Liverpool Master Builders Association," was proposed by Mr. Cowlin, who said its members were practically the fathers of the National Association, and had maintained towards the latter an unswerving loyalty.

The toast having been cordially drunk, Mr. Charles Tomkinson responded, and the proceedings concluded.

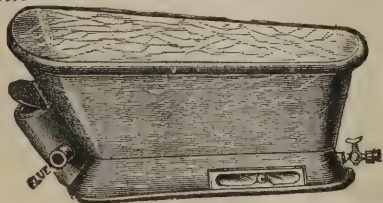
### THE BELGIAN IRON TRADE.

THERE is a brisk demand in the Belgian market for rolled iron, and especially for beams. There has been a slight slackening in the demand for small iron, but as it is impossible to lower prices under the existing conditions of production, the quotations of the syndicate are maintained. Some surprise has been expressed in consequence of preparations to increase the output having been made at several large Charleroi works, notwithstanding complaints that the existing production is rather excessive than the reverse. It is pointed out, however, that the works in question are those in which large iron beams for building purposes are produced. For these beams the demand tends to increase year by year. For some time past, it is stated, an actual difficulty in promptly supplying the orders has been experienced, but the Belgian ironmasters have been deterred from taking steps to increase their capacity of production by apprehensions of English competition. At present, however, the Belgian makers have reason to think that the English iron manufacturers have abandoned competition with them in this branch. The apprehension that the production of mild steel by the dephosphorisation process would prove an obstacle to the development of the iron beam industry, has also caused the Belgians to hesitate. England, it was argued, beaten in the manufacture of iron beams, seemed inclined to base its hopes on the production of steel beams, and in Germany the steel beam manufacture has made considerable

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progress. In Belgium, however—in consequence, it is hinted, of the Angleur Company, which holds the Thomas patent, having endeavoured to impose unacceptable conditions on the other Belgian establishments desirous of applying the process—this has not been the case, and it is now asserted that mild steel beams cannot compete economically with iron beams. In any case the development of the steel industry is apparently no longer regarded as a danger for the Belgian iron beam manufacture. For the rest, the Belgian steelworks are generally well employed, but business in rails is scarce, and the market is depressed.

#### METROPOLITAN SEWAGE.

ON Tuesday last a party of members of the Society of Engineers were enabled to examine the new Precipitation Works at Barking Sewage Outfall, constructed by the Metropolitan Board of Works. At the present time the whole of the sewage of the metropolis north of the Thames is conveyed to Barking Creek by three culverts, each 9 feet high by 9 feet wide, and is, in the first instance, delivered into a covered reservoir divided into four compartments, and altogether extending over an area of 9 acres. The sewage is stored in this reservoir during eight hours of each tide, and discharged into the river at high water at the top of the ebb. This reservoir is situated on the east side of the sewer, and immediately adjacent to the river bank.

The new works consist of covered precipitation tanks adjacent to this reservoir on its north side, and occupying the ground between the outfall sewer and Barking Creek, an area of between 10 and 11 acres. There will be thirteen of such tanks, each 31 feet 6 inches wide, and averaging about 1,000 feet long. Communications will be made between the outfall sewer and each of these tanks, each fitted with two penstocks, so that communication may be opened or shut off at pleasure.

The sewage will be admitted into each of the tanks in succession, and after being allowed to remain quiescent for a sufficient time to admit of the deposit of the solids in the sewage, the precipitation of which will be expedited by the admixture of 3·7 grains of lime and 1 grain of proto-sulphate of iron per gallon, the effluent will be run off over a weir, which will fall as the water in the tank lowers, so that the top film of the effluent only will be taken off, and the tank emptied gradually, so as to prevent any disturbance of the solids by the operation.

The effluent after flowing over the weirs (of which there will

be ten in each tank) will pass into culverts carried transversely under the tanks and extended, some into the compartments of the existing reservoir, and some into a chamber under the outfall sewer through which, at present, the sewage is discharged into the river from the existing reservoirs. When the level of the tide will admit the effluent will be discharged through this chamber direct into the river; but when the water in the river is too high to admit of this, the effluent will be conveyed by the other culverts into the several compartments of the present reservoir, and stored there until the level of the water in the river will admit of its discharge.

When each compartment is emptied of the effluent the sludge, which will be in a semi-liquid state, will be discharged through culverts passing under the outfall sewers into a collecting culvert, from which it will be conveyed by pipes into a receiving well or sump, and pumped into a series of twelve tanks placed side by side, and situate between the outfall sewer and the river. These tanks will each be 20 feet wide and 140 feet long, will cover an area of over an acre and a half, and, like the precipitation tanks, will be covered so as to prevent nuisance. The sludge will be allowed to remain quiescent in them so as to allow of a further precipitation, and the effluent water will be discharged over weirs into a culvert which will convey it into a store under the tanks, from whence it will be lifted and discharged through pipes to the liming station, there to be mixed with lime which is used for precipitation. The settled sludge remaining after this further precipitation will be discharged through culverts into a sludge store situate under the tanks, and will be lifted thence and conveyed by pipes along a jetty, and to a landing stage to be erected in the river, and there discharged into ships which will convey the sludge to sea. In the event of the ships being detained by stress of weather, there is a further store for sludge at a lower level extending under the whole of the area occupied by the upper stores.

On the north side of these sludge-settling tanks will be erected engine and boiler-houses and workshops in connection, to contain engines and machinery for lifting the sludge into the settling tanks, and the settled sludge into the ships, as well as for pumping the sludge effluent to the liming station.

The lime for assisting the precipitation of the solids of the sewage is introduced into the outfall sewers at a point about 700 yards, and the proto-sulphate of iron about 530 yards above the precipitation channels. The liming station will comprise a lime store, floors for slaking the lime, and six tanks for mixing

### BEAN'S PATENT DIRECT-ACTING VALVELESS WASTE-PREVENTING CISTERNS.

These Waste-Preventers are simple in construction and rapid and powerful in action. The working parts have been improved and are well balanced. The arrangements for charging the siphon are such that a slight pull by hand is all that is necessary to cause the immediate and automatic discharge of the contents of the Cistern.

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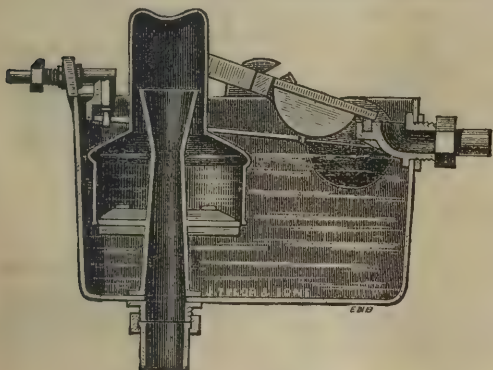
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the slaked lime with the effluent water from the sludge-settling tanks, or with sewage taken direct from the outfall sewers; an elevated lime-water tank or reservoir built above the lime store, and into which the lime-water will be lifted by pumps, for which machinery and the requisite engine and boiler-houses will be erected adjacent to the lime stores. From this elevated tank the lime-water will be conveyed to and injected into the sewage passing along the outfall sewers, through cast-iron injectors placed in the sewers. There will be means of turning the lime-water into any one of the three lines of sewers and of regulating the supply by means of sluice-valves fitted to the pipes leading to the injectors. The injectors consist of cast-iron chambers 4 feet 6 inches in length, 6 inches wide, and 6 feet in height, fitted with a number of nozzles, through which the lime-water will be injected and mixed with the volume of the sewage as it flows past.

The iron-water station comprises timber sheds for storing the proto-sulphate of iron, a mixing shed in which the iron will be crushed and mixed with water, an engine shed to contain engines and machinery for crushing the iron and mixing it with water, as well as for raising water for boilers and into mixing tanks. The iron-water will be conveyed by stoneware pipes, carried underground and along the top of the outfall sewer into a service tank, from which it will be carried by pipes into each of the three outfall sewers, and injected into the sewage through perforations in a pipe fixed vertically in each of the sewers. As with the lime-water, there will be appliances for regulating the supply of iron-water to each of the sewers, to meet the varying requirements of the discharge.

There will be a large settling pond, covering an area of  $1\frac{1}{4}$  acres, situate near the river, divided into six compartments, each 60 feet by 60 feet, and about 7 feet deep, into which water will be received from the river and allowed to settle; the clear water being afterwards filtered and used for the supply of the several boilers, for slaking the lime, and for mixing with the proto-sulphate of iron.

The jetty, which will extend 576 feet into the river from the present river bank, will be 15 feet wide, and will be a timber structure supported upon piles. At the river end of the jetty will be a timber landing stage 300 feet in length and 20 feet wide.

The iron pipes for conveying the sludge to the ships will be carried under the platform, and will be furnished at the end with a delivery pipe, socketed to admit of a vertical movement, so as to discharge the sludge into the ship at varying levels of

the tide. A tramway will be laid along the full length of the jetty connecting it with the whole of the works.

The contract for the works includes the erection of twelve cottages and a residence for the superintendent, and the diversion of the Old Galleons sluice and ditch, which is one of the main sewers under the jurisdiction of the Essex Commissioners of Sewers. There will be a large quantity of surplus earth from the excavations which will be used in forming the banks for the tramways, and in raising the general level of the ground, which is now 6 or 7 feet below the level of Trinity high water. The works extend over an area of about 50 acres, the quantity of sewage to be dealt with will amount to about 90,000,000 gallons per day, and the quantity of lime to be used in precipitation to 23 tons per day.

Two contracts have been entered into for the execution of the works—one with Messrs. Mowlem & Co., for the general work, for 4c6,000l, and the other with the Glenfield Company, of Kilmarnock, for engines and machinery, for 42,567l.

### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

10174. George Robert Rollason and Charles Arthur Rollason, for "Bath and lavatory basin fittings." July 13, 1888.

10177. Joseph Samuel Orton, for "Improvements in raising and supporting venetian blinds, and other similarly accumulating weights." July 13, 1888.

10180. Joseph Henry da Fonseca, for "Improvements connected with water-closets and urinals." July 13, 1888.

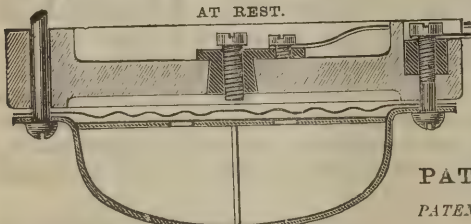
10219. Robert William Gamble, for "A new or improved combined door-spring and alarum." July 13, 1888.

10247. George Harris Haywood, for "Improvements in kitchen ranges." July 14, 1888.

10273. Robert J. Thompson, for "A cord or rope fastener or grip for window-blinds." July 16, 1888.

10288. Zachariah Pack and James Pack, for "Improvements in brick-moulding machines." July 16, 1888.

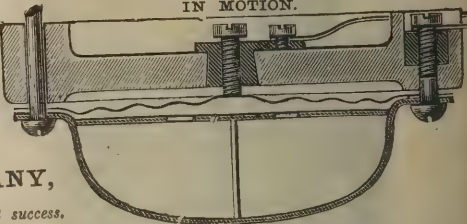
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10298. "Improvements in and apparatus for curing smoky chimneys, and preventing down-draught in flues, open and other fireplaces." July 16, 1888.

10312. George James Snelus, Thomas Gibb, John Cameron Swan, Herbert Smith and William Whamond, for "Improvements in and connected with the manufacture of cement." (Complete specification.) July 16, 1888.

10321. George Lee, for "Improved apparatus for heating greenhouses and other buildings with gas." July 17, 1888.

10343. John Robinson Crossthwaite, for "Improvements in the combination of materials employed in the construction of chimney-pieces, mantel-pieces, or the like structures." July 17, 1888.

10358. Pierce, Butler and Pierce, for "Improvements in heating apparatus for dwelling-houses, factories, and the like." July 17, 1888.

10409. Samuel Williams, for "Bolts for doors and other purposes, called Williams's Improved Tower Bolt." July 18, 1888.

10442. Fred. Lewis Lawrence, for "Improvements in the construction of frames for pictures, mirrors, panels, and similar purposes." July 18, 1888.

10447. William Parkes and Charles Wakeman, for "An improved sectioning set square for drawing equidistant parallel lines in any direction of variable pitch." July 19, 1888.

10448. George Michael Asher, for "Improvements in drawing-pens." July 19, 1888.

10456. J. E. Steevenson and Sylvanus Eddington, for "A mould for making and pressing bricks." July 19, 1888.

10459. William Harte, for "A combined window fastener for sashes and for locking windows when opened for ventilation." July 19, 1888.

10460. Wm. Clark, for "A horizontal condensation bar in combination with an improved metallic sash-bar for glass roofs and similar structures." July 19, 1888.

10467. George Holmes, for "Improvements in night latches and other spring locks." July 19, 1888.

10473. Julius Schlesinger, for "Improvements in the manufacture of cement." July 19, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

5169. William Bracewell and William Hayhurst, for "An improved flooring cramp." April 7, 1888.

6091. Richard Fleming, for "An improved combined shutter and sun blind." April 24, 1888.

8266. Frederick James Burton and James Palmer Robertson, for "An improved window sash-fastener." June 6, 1888.

8599. William Palmer, for "An improved T-square." June 12, 1888.

8685. Alexander Frederick White, for "Improvements in hot-water apparatus heated by gas." June 13, 1888.

8831. Edwin Chatham, for "A new or improved apparatus for crushing and mixing mortar." June 16, 1888.

8832. George Henry Leane, for "Improvements in the method of constructing buildings and works in alluvial soils." June 16, 1888.

9053. Thomas Hill, for "Improvements in means for connecting knobs and cupboard turns with their spindles." June 21, 1888.

9074. George Frederick Newman (of the firm of William Newman & Sons), for "Improvements in door springs and checks." June 21, 1888.

9138. Francis Joseph James Gibbons, for "Improvements in fanlight openers." June 22, 1888.

9166. Hippolyte Snellot and Hippolyte Raynaud, for "Improvements in the production of iodine and iodine compounds." June 23, 1888.

9176. Claude Marius Duplany, for "Improvements in and connected with fireproof curtains, for preventing the spreading of fire and smoke in theatres and other similar buildings." June 23, 1888.

9273. Charles Bennet, for "Improvements in the method of laying and securely fastening wooden flooring." June 23, 1888.

9466. Thomas Tucker, for "An improved automatic sash or window fastener." June 29, 1888.

9962. William Samuel Cooper, for "Improvements in water-closet structures." July 9, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of this journal, give notice at the Patent Office in the prescribed form of such opposition.

9789. Edward Scholey, for "A perpetual motor." July 12, 1887.

11287. De Fonblanque, for "Improvements in apparatus for ventilating rooms, chambers, buildings, ships' cabins, railway carriages, and the like." August 18, 1887.

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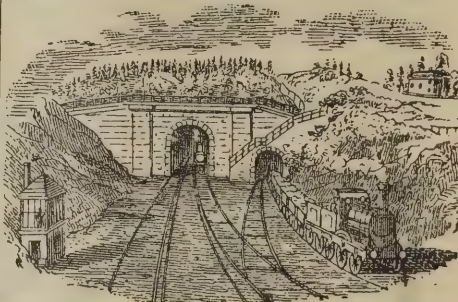
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12603. William Baird, for "Improvements in and relating to fastenings for the doors of theatres, halls, and the like." September 17, 1888.

13877. William Bird, for "Improvements in the construction of street gulleys." October 13, 1888.

5806. Robert Cooper, Herbert Fitzroy Clayton and George Holden Holroyd, for "An improved filter and apparatus connected therewith." April 18, 1888.

#### PATENTS SEALED, JULY 20, 1888.

8266. William Dewhurst Cliff and Basil Edward Peto, for "A new or improved brick or building block." June 8, 1887.

8450. Robert Low, for "Improvements in dovetailing machines." June 11, 1887.

9153. William Fraser, for "A window blind cord-rack." June 28, 1888.

17130. Thomas Robert Shelley, for "Glazing the roofs and sides and other portions of railway stations, conservatories, billiard-rooms, and other structures." December 13, 1887.

4189. John James Jones, for "Improvements in appliances for locking or securing doors, covers, cases, gates, or other means for closing openings, or chains, or links." March 19, 1888.

4431. Frederick John Henderson, for "Improvements in ball valves." March 22, 1888.

4712. Henry Harris Lake, for "Improvements in and relating to lavatory basins, baths, and the like." March 27, 1888.

#### ABRIDGMENTS OF SPECIFICATIONS RECENTLY PUBLISHED.

"Improvements in cowls for chimneys and ventilating shafts." T. S. Truss. No. 8917. 1887. These improvements are for both ejecting and injecting cowls, and consist mainly of a circular hollow box about as long as its diameter, and in this box, which is placed over the flue or shaft, are found two chambers, the centre chamber being the receiving chamber, and the outer one the ejecting chamber. The inlet for the smoke to the receiving chamber is thus an orifice made at the bottom of the box, and the outlets for the smoke or air from the receiving chamber are made at equal distances in the division forming such chamber. The run and area of these outlets are about equal to the area of the inlet orifice into the receiving chamber from the chimney.

*Claim.*—Ejecting and injecting cowls for chimneys and ventilating shafts, having receiving and ejecting chambers with curved or bent-mouthed inlets and outlets thereto or therefrom,

as arranged and constructed in manner hereinbefore described and set forth.

"Improvements in the construction of iron buildings." L. S. Buffington. No. 7534. 1888.

*Claim 1.*—A building having a continuous skeleton of metal, a covering of veneer, and a non-conducting packing between the skeleton and the veneer for the purpose set forth.

*Claim 2.*—In a building frame a continuous diminishing laminated post formed of layers of metal plates secured together and arranged to break joint, and decreasing in number towards the top. (There are twelve other claims to this patent.)

"Improved means of securing door handles and latch followers to spindles." W. Johnson. No. 3001. 1888. The knob is fitted to the spindle by a longitudinal dovetail connection, which will insure a permanently tight fit of the spindle in the socket of the handle, and prevent play of the handle in any direction.

*Claim 1.*—The herein described means of securing a knob handle to its spindle, consisting of a dovetailed tenon in the socket of the handle fitting in a longitudinal dovetailed groove in the spindle (or *vice versa*) in combination with a cross pin, set screw, or other means of preventing longitudinal motion of the knob on the spindle.

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AUGUST BANK HOLIDAY.—Cheap tickets will be issued by the Great Eastern Railway, *via* the "Harwich route," enabling passengers to visit the Brussels Exhibition, the Ardennes, and Holland. Passengers leaving London and the North on Friday or Saturday can reach Brussels the next morning, and return on Monday, arriving in London and the North on Tuesday. They have arranged, in conjunction with the General Steam Navigation Company, a special excursion to Hamburg, at single fares for the return journey. Passengers leave Liverpool Street Station at 8 P.M. on Wednesday, August 1, or Saturday, August 4, and Parkeston, at 10 P.M., by the General Steam Navigation Company's passenger steamers, arriving in Hamburg on Friday or Monday morning, and return from Hamburg on Wednesday, August 8, or Saturday, August 11, at 10 P.M., or as soon after as tide permits, being due in London on the Friday or Monday morning.

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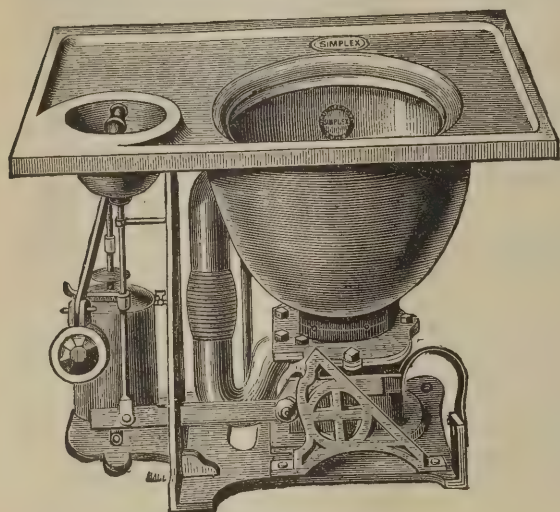


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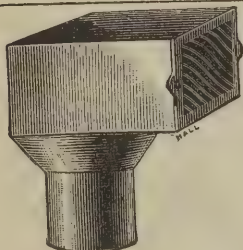
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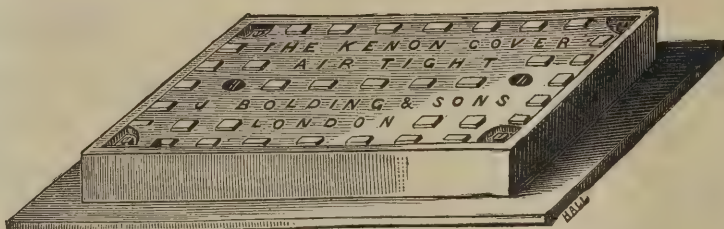


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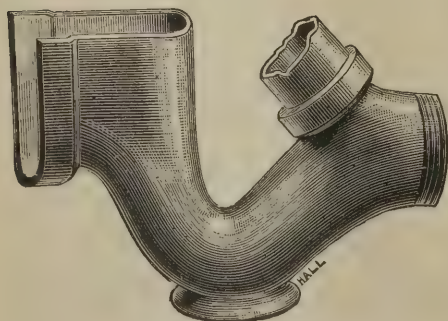
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# The Architect.

## THE WEEK.

MR. LORENZ HERKOMER, who died suddenly on Friday last, was a typical craftsman of the old days. He was a wood-carver, whose work was fitted for a cathedral or a palace, but, as he was modest and sensitive, he did not gain the success which he had a right to expect. Latterly Mr. HERKOMER was happy, as he was able to occupy himself on the carving which his son, in order to please his father, had resolved to introduce largely in the new buildings at Bushey. He could follow his fancy, and be as elaborate as he desired, without any apprehension of what might be the commercial value of his labour. His workshop was consequently almost unique, for in it one could see a craftsman enjoying himself like an amateur. He was able to give full play to his ability, with the consciousness that he was helping to add beauty to a home for his descendants, and that they would be the guardians of his best work. Mr. LORENZ HERKOMER preserved the old-fashioned German simplicity and straightforwardness, and, as a specimen of a race of men that is fast becoming extinct, he was no less interesting than as an artist.

THE position of sculpture in this country, and the risks which attend most followers of the art, are suggested by the appearance of the names of Sir JOHN STEELL and Mr. JOHN BELL in the pension list, for sums so small as to make the royal bounty appear a humiliation. The former is to receive 100*l.* a year, whilst Mr. BELL obtains only one-half that sum. Both sculptors have attained prominence, and in their old age are not able to be independent. Sir JOHN STEELL is the author of statues and groups which stand in public places in Scottish towns and cities, and, as a consequence of honours awarded him, it might be imagined that many patrons would give him commissions. But apparently his countrymen preferred to go elsewhere for busts of themselves. Mr. JOHN BELL was the abler artist of the two, and he took a prominent part in all that was done to popularise art some forty years ago. His statuettes, lectures, and writings alike promoted that end. Mr. BELL's larger works, such as his *Eagle Slayer*, *Una and the Lion*, and *Cromwell*, well deserved the admiration they received. His striving for the public good merited a better recognition than it has received this week.

THE decision of the Académie des Beaux-Arts, in respect to the paintings submitted in competition for the Prix, will give more dissatisfaction to the painters, such as MM. CABANEL, BOUGUEREAU, BOULANGER, LEFEBVRE, who were the teachers, than to the competitors. The jury find that not one painting merits the Prix de Rome, and what is still more remarkable, not one is held worthy of the next prize or "premier second grand prix." The highest prize awarded this year is the "deuxième second grand prix," and we are glad to say the winner is the artist who bore the English name, Mr. CHARLES LOUIS MAURICE ELIOT, but who is claimed as a native of Paris, where he was born on September 9, 1862. M. PAUL BUFFET has been granted an honourable mention. The public are disposed to agree with the judges, and the decision may lead to some changes in the system of teaching.

THE condition of the land near the Law Courts in the Strand is more suggestive of a sort of "Tom Tiddler's ground" than of Government property. A stranger would imagine that the place was left to grow noisome things, in order to suggest the character of some of the enactments which are administered in the neighbouring building. Government officials have no sensitiveness about the neglect of Government property, and the Strand enclosure may have been considered as a piece of picturesque ground or natural landscape, and for its preservation we ought all to be grateful. Any one who may have the faculty for enjoying desolation of that kind will do well to hasten to the Strand. There is to be an end to the neglect which was approved during so many years. Some anonymous lover of the amenity of London has offered to pay the expense of transforming the ground, and the Government have accepted the

offer. Whether it is creditable to depend on individuals for the improvement of public property is a question which no one is likely to raise, since all Londoners will be glad of the removal of an eyesore on any terms.

THE interest of the triennial exhibition at Antwerp will be enhanced in the eyes of strangers by the two rooms which are assigned to the works by the late NICAISE DE KEYSER, who was director of the Antwerp Academy, and by the late LOUIS GALLAIT, who was one of the leaders of the Brussels school. Both were figure-painters, but there was a difference in their styles. GALLAIT was more of a Frenchman than DE KEYSER, and, some would say, was less virile. But while the Brussels painter's works were made popular by fine engravings, very few of DE KEYSER's pictures have been reproduced, and his merit is not so well recognised as it deserves.

THE new system of local government for the metropolis may bring many changes, but it is improbable that the building regulations will be soon set aside. The little book of Mr. MARSLAND, the district surveyor, containing all the regulations in force at present, will therefore have more than temporary use. It is arranged in the form which is best adapted for reference. The different regulations relating to one subject are brought together, and an architect or builder will not be obliged to wade through the clauses of the various Acts in order to discover the needed information. From its size the book will not be an encumbrance if carried in the pocket, and it is clearly printed. Mr. MARSLAND's book is likely to supersede more cumbrous books on the subject.

THE death of Mr. FRANK HOLL on Tuesday morning will be generally regretted. He had worked his way to a foremost place by his ability and industry. A member of a family long associated with English art, his success became the more gratifying to his countrymen. In his early works he seemed to give preference to scenes of a rather sorrowful kind, but his marvellous success as a portraitist barred attempts at painting real or imaginary incidents. Mr. HOLL was only in his forty-third year—an age at which many able artists were unable to boast of one success. In so short a life he had gained honours and rewards, and a reputation which will outlast the present generation.

THE resources of the "Librairie de l'Art," which are those of a Government department, were never better utilised than in the *Revue Universelle Illustrée*. This new publication is a marvel of enterprise, for the first number contains one hundred and twenty-eight quarto pages by some of the best French writers, with about forty illustrations. The price is only a franc! The contents are varied, but the majority of the articles have more or less relation to art. The opening story is founded on an incident in the life of GÉRARD TER BORCH. M. EUGÈNE MUNTZ writes with authority about DA VINCI's statue of FRANÇOIS SFORZA, and gives facsimiles of the designs for the work. M. GARNIER—who is one of the authors of the "South Kensington Handbook on French Pottery"—relates the early history of the Sèvres manufactory. M. ADOLPHE JULIEN supplies a memoir of BOIELDIEU the composer. It is illustrated by a lithograph, that is amusing from being a record of the kind of costume which passed for Scottish on the French stage in 1825. M. PAUL LEROI writes with his customary candour about M. EDOUARD DÉTAILLE, an artist whose greatness was first recognised in *The Architect*. The article is illustrated by many of the artist's marvellous sketches with a pen. M. MOLINIER writes about CHARLES SAUVAGEOT, who, out of his savings as a violinist, managed to amass a splendid collection, which he presented to his countrymen. A pleasing song-dance of the Bretons is noted and harmonised by M. TERSOT. Dr. GUERRIER criticises some of the pictures and statues in the Salon from a physician's point of view. Lastly, M. CHAVELIER narrates the legendary history of the Church of Tann, in Alsace. We have not mentioned the articles which probably will have most interest for readers who are not artists. There is a prejudice against French writers, but this new magazine may be safely admitted into any English home, and a more helpful aid to home education it would be difficult to find.



## WATER ENGINEERING.\*

THE whole work of the hydraulic engineer may be said to consist in constructing things which will not allow water to escape from them, and in taking advantage of gravitation to form channels through which water will run from one point to another. Or, to put it in a different form, his science consists in the formation of artificial lakes and streams. A good deal of mystery may be thrown over the work by practitioners, but there is no easier branch of engineering than that relating to water.

It has another peculiarity in the little use which is made of architecture in its operations. The ancient Romans were not masters of the theory of hydraulics, but they formed viaducts, which were among their best works of architecture. In connection with modern waterworks, all that can be called architecture is an occasional tower for the pumping-engine, which is commonly of an absurd form. It is not necessary to go outside London for examples. Neither the conduits nor the reservoirs are more than the work of navvies, and might have been designed by them. In fact, waterworks are more characteristic examples of what navvies can do than the railways.

In this country the designing of waterworks is in the hands of a few specialists, and the man is to be pitied who tries to get plans through Parliament if any of those engineers should be engaged by the opposition. Then it is discovered that the widest experience in construction will not qualify an engineer to design a wall for a reservoir, or to decide on the diameter of a cast-iron pipe. It is necessary that he should have had practice on waterworks. One or more of the experts must be called in at a high fee if a Parliamentary Committee is to be convinced, and, unfortunately, there are few cases in which the approval of committees is not indispensable.

The conditions of practice are suggested to us by seeing Mr. SLAGG's work on "Water Engineering." It is an excellent book, for it does not depend upon the experience of the author, for, as he acknowledges, "he has freely referred to such sources of information as were available to him." But how many men will be able to utilise the information supplied by the pages in this country? In all that relates to the construction of waterworks, and the straightening or deepening of rivers, Parliamentary powers are indispensable, and, as we have said, they are only granted on the evidence of a very few men. Did Mr. SLAGG ever engineer a Bill through the committee-rooms, or does he imagine that if he came forward as the author of a book on "Water Engineering," there would be any value attached in consequence to his evidence? We have known men of equal standing to fail in an attempt of that kind, although no valid objection could be raised against their plans. Parliament, in fact, has in this branch of engineering created a privileged but very small class of engineers who are able to monopolise the commissions, and knowledge is of little avail against them. In this country a man who proposes to devote himself to hydraulics cannot expect to attain a higher office than an assistantship under one of the few experts, and, as a rule, posts of the kind are given to former pupils. In the Colonies there may be fewer restrictions, and a better chance for men who are qualified.

While it is necessary to forewarn novices about the prospects of hydraulic engineering, it must be admitted that there is much fascination about work of that kind. The old Italians who made such elaborate calculations concerning the flow of water and other subjects, were not always men who had charge of works. One of the best books on hydraulics in the English language is Professor DOWNING's, but he never once refers to any experience of his own, and we doubt if he ever saw the simplest work executed in a drain, or the laying of a pipe. He was able to amuse himself with calculations about all that water was supposed to do, and, in a theoretical sense, his labour was not in vain.

Mr. SLAGG does not oppress practical readers with the minutiae in which college professors can revel. He does not introduce mathematics unless in cases where words are

not sufficient by themselves, and his formulæ are always of the simplest kind.

The natural way to commence a book on water engineering would be with the gathering grounds or catchment basins, and then, when the way to obtain an adequate quantity of water was explained, to show how it was stored and distributed. In the book the "embankments of water works reservoirs" are first treated, and the gauging forms the subject of the seventh chapter.

In an embankment for a reservoir the main feature is the puddle-wall in the interior, which has to be efficiently covered in order that none of the water may evaporate through the wall. More care has therefore to be taken with forming a reservoir embankment than with one for a railway, and the part next the water must not only have a greater slope than on the outer side, but the surface must be compacted. The pressure on the banks of a reservoir is seen from the bursting of the reservoirs at Bradfield and Holmfirth, the latter being filled for the first time. According to Mr. BATEMAN's account, "The Bradfield embankment was constructed on ground liable to slide down upon the face of an underlying flag-rock with a smooth surface. But, besides this, the inner part of the bank was of very loose material, and the pressure would be horizontal, the puddle-wall and the outer part of the bank having to bear the whole pressure of the water in the reservoir because the inside slope was permeable by water. The puddle-trench was sunk through the flag-rock into the shale below, but there, on the outside, lay the flag-rock at an inclination of 1 in 4, as smooth as polished marble; and when the pressure came against the puddle-wall the whole thing gave way." A different cause was found by Mr. (now Sir) HENRY RAWLINSON. He considered "that the joints of the pipes were opened by reason of the surrounding puddle sinking in the middle, and allowing water to creep along outside the pipes, and so made a beginning of a more serious run of water, as there were no valves on the inner ends of the pipes; and if such a beginning was made the run of water could not have been controlled, the valves being at the foot of the outer slope of the embankment." Mr. SLAGG believes that the accident arose through the embankment on one side of the puddle-wall being washed away, when the wall would become unable to resist the pressure of the embankment on the opposite side.

The capacity of a reservoir will depend on the quantity of water which must be stored and which must correspond with the number of inhabitants to be supplied. According to Mr. BATEMAN 120 days' supply is sufficient on the western side of the country, and 240 days on the eastern side, but there are places where 300 days' supply may be needed.

There are many things besides the banks to be considered in laying out a reservoir. It is necessary to provide for floods, and for that purpose a large weir has to be constructed with a by-wash to carry off the water. In one case in Staffordshire, where a short weir was used, the water rose 5 feet above the weir, "and if only the accidental occurrence of a wind blowing down the reservoir had taken place at the same time, there can be no doubt that a great disaster would there and then have happened." The question of conduits is of importance. Mr. SLAGG says that for one over 20 inches diameter masonry should have the preference. "A circular conduit 2 feet diameter and half a brick thick would usually be laid at less expense than a pipe of the same size." But in estimating, locality will always count for much.

Sites for service reservoirs are sometimes difficult to find. In Liverpool they are eight miles distant, and in Manchester five miles. Some, of course, have to be covered. In the construction of the tanks greater care is generally needed than with the storage reservoirs, for the latter being in country districts, the damage through bursting would be less than when the accident occurred nearer a town.

Mr. SLAGG describes all the arrangements for the distribution of water in towns, and he has also chapters on subjects of a different kind, such as mills, turbines, &c. But he ought in his next edition to introduce information about the supply to country houses. We have heard of cases where costly mansions were erected without any provision for obtaining water, and where wells were sunk

\* *Water Engineering: a Practical Treatise on the Measurement, Storage, Conveyance, and Utilisation of Water.* By Charles Slagg, C.E. Crosby Lockwood & Son.



nothing was done to test their efficiency. It may have been supposed that the water supply was outside the architect's functions, but the owners of the houses in each case declined to accept that excuse. Mr. SLAGG appears to be of the stuff of which hydraulic engineers are made, and as he writes with an evident interest in his subject, he could add to the utility of his book by the additions we have proposed. It is given to few to carry out works for water supply on a large scale, but the arrangement of a water supply for a country mansion is an everyday affair. All that is contained in the book is informing, and for any one who desires to begin the study of hydraulics with a consideration of the practical applications of the science there is no better guide.

#### MANCHESTER SOCIETY OF ARCHITECTS.

THE following address was delivered by the president at the last general meeting of the Manchester Society:—

Gentlemen,—I regret that circumstances have unavoidably prevented me from addressing you at an earlier period of the year, as the custom of the office to which you have elected me demands. In proceeding to do so, permit me to tender my hearty thanks for the honour you have conferred upon me. Although I cannot hope to rival the ability which has distinguished my predecessors in the conduct of the affairs of this Society, I venture to say that I yield to none in a strong desire for its welfare and the maintenance of its prestige.

The interests of our profession, as of all others in a restless and competitive age, necessitates increasing vigilance. Each succeeding year entails fresh responsibilities, and brings up new questions for settlement. To some of these questions, old and new, I propose to invite your attention; and although I cannot hope to offer much that is novel to your consideration, my remarks may perhaps serve to remind you of the work that lies before us during the year.

At the time when my predecessor in the chair delivered his address, namely, on March 22, 1887, we were looking forward with pleasurable anticipation to the holding of the Jubilee Exhibition in Manchester. I need scarcely remind you that the Exhibition proved a magnificent success, and that it carried out its design of representing the progress made during the Queen's reign in the fine arts, machinery, chemistry, and other industries, with most satisfactory completeness. It must always be a matter of congratulation that our Society (thanks to the initiation and energy of our then president, Mr. Murgatroyd) secured so fine and comprehensive a display of the architecture of the Victorian era. Three of our past presidents, Mr. Waterhouse, R.A., Mr. Redmayne, and Mr. Murgatroyd, were placed on the art section of the general committee, and to the efforts of these gentlemen, especially to the untiring industry of Mr. Murgatroyd, we owe the collection of a perfectly unique and most instructive series of drawings and designs, which showed, as I believe no other Exhibition has yet done, the salient features and the most distinguishing characteristics of the architectural art of the last fifty years.

On referring to the catalogue of the Exhibition, I find that the number of examples was 294, and these were the production of 129 architects. Almost every description of work was represented—ecclesiastical, military, municipal, commercial, and domestic—and the collection comprised not a few of the best known and most remarkable buildings erected during the period covered by the Exhibition. I cannot help thinking, however, that the Architectural Court (so called) was unfortunately situated. The position assigned was entirely unfavourable either to the attractive exhibition of the works, or to their adequate study. It was in that part of the building devoted to organ solos and concerts, and was practically closed for some hours each day during the orchestral and other musical performances. Moreover, the passages were often blocked with chairs, and access to a view of the drawings was frequently uncomfortable and inconvenient. As a consequence, there was probably no section of the Manchester Exhibition which was less seen, or less carefully examined than the Architectural Court—a fact which perhaps accounts for the very little attention it received from the general newspaper press. It is unfortunately the fate of architecture in most exhibitions to be treated with scant courtesy, and thrust almost into the background; and it behoves the profession, not only on their own account, but on behalf of the public (who would take a greater interest in exhibitions of architectural designs if they were made more attractive and instructive) to press their claims to a different treatment than that to which they are ordinarily subjected.

Of the drawings at the Manchester Exhibition, rather more than one-fourth were of buildings in Manchester and its suburbs—a disproportionate number, no doubt, but unavoidable under the circumstances. It is perhaps worth while

recalling the fact that, with the exception of the older churches and chapels and a few public buildings like the old Town Hall, the Royal Institution, the Athenæum, the Concert Hall, and the Chorlton Town Hall—all of which were erected before the Queen's accession to the throne—modern Manchester as we know it is, architecturally, entirely the creation of the Victorian era. Sir Charles Barry was the dominating influence in the decade between 1830 and 1840, and Edward Walters (to my mind one of the most accomplished architects of his time) may be said to have held the same position a decade later. He may be regarded amongst other things as the pioneer of the warehouse reconstruction of the town. Since then the process has been going forward with ever-accelerating impetus, until within the last few years. The advance of our art in Manchester was fairly reflected and illustrated in the Exhibition, though possibly, if the historic idea had been more closely kept in view, the display might have been made more adequate. Beyond noting and enforcing the fact of that advance, it is happily no part of my duty, even if I had the ability, to draw any conclusions as to its general character, or to attempt to estimate its quality in comparison with architectural progress in other parts of the kingdom. It will be more within my scope and perhaps more useful to direct attention to some things which at the present time obstruct our efforts. More than one of my predecessors in the presidency have dealt with this subject; and I regret to say that the difficulties which they pointed out are still unremoved.

First and foremost comes the unsettled question of the building by-laws and the dilatory action of the Corporation. It will be remembered that, in the March of last year, a joint meeting of our Society and the Manchester and Salford Sanitary Association, was held in the Memorial Hall, to discuss the subject, and to urge once more upon the City Council the pressing need for the immediate publication in one volume of the building regulations and by-laws under which the municipal authorities profess to act. Our ex-president, Mr. John Holden, read an able paper, in the course of which he showed that for more than twenty years our Society has been endeavouring, but so far ineffectually, to arouse the Corporation to a sense of its duty in this matter, and to the dangers and the injustice of the existing system. A memorial adopted by the joint meeting was presented to the April meeting of the City Council last year, and a sub-committee of the Highways Committee (to whom the memorial was referred) was subsequently appointed to prepare an amended code; and only last week completed its labours. The amended by-laws, we are informed, are now in the hands of the printers; and it was announced at the City Council on Wednesday, June 6, that before being issued they would be submitted to our Society, in order, to quote Mr. Alderman Heywood's words, "to insure something like accuracy in the description of the various parts of buildings." How far the revision is a satisfactory one remains to be seen. The municipal authorities have not availed themselves of our offer of co-operation and assistance during the process of revision, and it is therefore possible that the regulations as amended and codified may require something more than the mere rectification of technical terms. But it is a matter for congratulation to feel that we are approaching the close of a long, a tedious, and what ought to have been an unnecessary agitation; and the Society will doubtless take care that nothing on its part shall further delay the completion of the work.

Attention was called two years ago to two comparatively minor questions—overhead wires and signboards. There has been no diminution in the number of overhead wires, but on the contrary a considerable increase. They are dangerous objects, and they are inimical to art, destroying the effect of an important part of the architect's composition—the sky-line of the building.

Within the past month, a still worse outrage has been perpetrated by the erection of three stacks of tall chimney funnels on bases of red bricks, on the top of a block of stone buildings in a prominent part of the city. In this case we may be tolerably certain that the services of an architect have been dispensed with, and that the monstrous abortion is the work of some building contractor. The owner, therefore, is to blame, and possibly can only be brought to a sense of the enormity he has committed by the pressure of public opinion. But it may be well also to ask, whether the municipality ought not to have powers to prevent the destruction of the artistic aspects of the city.

I have already mentioned the warehouse reconstruction of the town, which has been in progress during the last forty or fifty years.

In planning and designing buildings for commercial purposes we are met, of course, with the difficulty of light, an abundance of which is, in most cases, absolutely essential. In few towns is the problem harder of solution, for, as a rule, our streets are narrow and confined, and our atmosphere is murky. The difficulty is to secure ample light, and at the same time obtain a reasonable amount of pier space in the ground floor



storey, in order that the superstructure may be supported by the piers, and not upon iron columns or standards with little more than a veneering of granite, apparently quite inadequate to sustain the superstructure. There are in our city buildings of recent date that are apparently unsupported, for as far as the evidence of the senses goes, there is nothing beneath the superstructure but huge sheets of plate glass, the iron columns which are really the means of support being set back within the glass line, and so disguised as to be indiscernible. We cannot altogether lay the blame upon the designers of such buildings, for we may be quite sure they would never have produced such glaring inconsistencies if they had not been tied down by the false ideas of owners and tenants. At the same time it is to be feared that a sacrifice to truth is in many instances too readily made; and there is no doubt that an architect, by exercising firmness and judicious reasoning with his client, may often minimise the evil to which I have referred.

Looking back some twelve years, we can most of us remember that the building trade of Manchester was in a state of extraordinary and probably unprecedented prosperity. A long period of depression has supervened, during which our profession has suffered seriously. But at the present moment, I am happy to say, there are symptoms of a revival. Two projects are on foot of momentous importance, which seem destined to alter materially the existing state of affairs. These are the construction of the Ship Canal from Manchester to the estuary of the Mersey at Eastham, and the amalgamation of Manchester and Salford, with the addition, possibly, of some of the large neighbouring townships. The construction of the Ship Canal is being prosecuted with extraordinary vigour, and with engineering and mechanical appliances greatly superior to any previously brought to bear upon the same character of work, so that the completion of the vast undertaking seems likely to be effected within a shorter period than the four years originally contemplated. In our immediate district the face of the tract of land between Regent Road Bridge and Trafford Park on the one hand, and between Stretford Road and the Race Course and Ordsall on the other, must necessarily undergo a transformation of which we have at present little conception; and in the wake of the maker of the canal and docks will inevitably and necessarily follow the architect and builder.

Concurrently with this undertaking, and also with the changes foreshadowed by the County Government Bill, a movement has been started under most influential and promising auspices, for the amalgamation of Manchester and Salford into one city or county. This proposed union, which has been advocated by a few for many years, has at length reached the domain of practical municipal politics; its need has become more manifest by the pressure of events and circumstances; and a final decision is likely to be arrived at before many months have elapsed, which will settle once for all the future well-being and the powers of development of this populous community.

I think our Society would do well to render all the assistance in its power to the furtherance of the proposed union; and there is doubtless much information of value in the possession of the members which would prove most serviceable to the Amalgamation Committee. It is desirable that, either by the report of a committee of the Society, or by the voluntary act of individual members, any such information should at once be placed at the disposal of the promoters of the movement. For example, I venture to think that few men know better than architects the striking differences in the value of sites on the Salford side of the river, as compared with the value of land and positions on the Manchester bank.

Apart from such considerations, however, the proposed amalgamation could not fail to confer far-reaching benefits. With one central municipal government, great public improvements could be effected which are impossible under the present dual system. The river Irwell, now little better than an open sewer, the effluvium from which I have no doubt has contributed in a great degree to the abnormally high death-rate of the two boroughs, could be taken in hand by the conjoint authority. Besides more efficient sanitary arrangements, the united boroughs would, I think, be enabled to effect an improvement in which we, as architects, would especially rejoice, viz., the covering of the river from the Victoria Railway Station to the new Bailey Bridge, or even beyond; the formation of a fine open space between the Cathedral and the Exchange Station, and the construction of a new and broad thoroughfare over the river from Victoria Bridge to New Bailey Street. The effect of this splendid improvement in enhancing the value of property on the Salford side can scarcely be over-estimated.

Whether it be from prejudice, or sentiment, or the force of association, it is impossible to say, but it remains a remarkable and undoubted fact, that the commerce which is represented by the great shipping and merchants' warehouses of Manchester, will not move across the river, notwithstanding its proximity to the Exchange, but prefers to seek a much more distant part of the city. I am convinced in my own mind that it is solely in consequence of its severance from Manchester by the river, and

having no convenience of access save by the bridges, that Salford remains a borough of comparatively little importance, and dependent for its existence almost entirely upon Manchester. The city would gain in prestige by the union, but I think Salford would in every way derive the greatest benefit, and several great improvements that are now frustrated by the existence of two municipal governments for what is virtually one community, could be accomplished by the amalgamation, and can never be attained without.

Turning to matters more strictly affecting our profession, I think we have reason to congratulate ourselves that the re-arrangement on a broader basis of the Royal Institute of British Architects has at length been completed, and will shortly come into operation. The subject has engrossed the attention of our Society for the last five years, and, in my opinion, it has never assisted in the solution of a more important question. All of us, I presume, whether we are members of the Institute or not, have come to regard it as the central authority of the profession; and in any case, a Society which numbers something like thirteen hundred members, eight hundred of whom are in independent practice, must necessarily exercise a great if not a dominating influence. It is, therefore, of the utmost importance that it should adapt its constitution to the changed circumstances of the times, and by giving a hearing and weight to the views and interests of those members who practise at a distance from London, become thoroughly representative of the whole of the profession in town and country. Such was the view taken by the Manchester and other provincial societies. The representations made to the council of the Institute were met in the most courteous manner, full consideration and discussion followed, and the result has been the obtaining of a supplemental charter, dated March 28, 1887, containing largely-extended powers and a code of by-laws for the management of the Institute, under which every member throughout the country has a full share and interest in deciding all matters affecting the profession to which he belongs.

One of the proposals which is now being dealt with under the new charter and by-laws is the federation of the provincial societies (as societies) with the Institute, by which means the rules and regulations and schedule of professional practice throughout the country will be co-ordinated and made uniform; and while the provincial societies which ally themselves to the Institute will retain their independence, they will have a positive interest in the Institute, as the presidents of the most important ones (if Fellows of the Institute) will ex-officio have a seat on the council of that body. All members of the federated societies, if members of the Institute, will be entitled to a deduction from their subscription equal to 25 per cent., which, in the case of Fellows, will be equivalent to the amount of their subscription to this Society. Again, all members of the federated societies will have access to the rooms and library of the Institute, of course under certain restrictions. These are important concessions, made, I consider, in the most liberal and friendly spirit by the Institute, and which should and I hope will result in a large increase in the number of members, not only of the Institute, but also of the provincial societies. Many architects, amongst them my partner and myself, did not under the old arrangements feel justified in joining the Institute. Our objections are now removed; we have both become Fellows, and I understand that many others who held the same views have also decided to join. Personally, I may say that I consider it is the duty now of all properly qualified architects to connect themselves with the Institute, as the profession generally will thereby gain very much in the estimation of the public.

As you are aware, Manchester, through this Society, has from the outset been prominently connected with this movement. It already includes within its boundaries a larger number of members of the Institute than any other city or town in the country (London, of course, excepted), and I appeal to you to see that this position is not vacated or even jeopardised.

The examinations in architecture by the Institute, which qualify for admission as Associates, are of the greatest importance, and all students should consider the passing of such as imperative. Two of these examinations have already been held in Manchester, under the conduct of this Society, and others, no doubt, will follow in due course.

These examinations, and the membership of the Institute or of the allied societies, really render superfluous the registration about which we have heard so much lately. The Bill entitled the Architects, Engineers, and Surveyors Registration Bill, recently presented to the House of Commons, and withdrawn, would, I feel satisfied, had it been passed, have done much mischief. The Bill, it may be stated, proposed to delegate to a general council, composed of twenty-six persons (of whom only fourteen, under the provisions of the Bill, need necessarily be architects, engineers, or surveyors), functions which are now performed respectively by the Royal Institute of British Architects, the Institution of Civil Engineers, and



the Surveyors' Institution. It professed to be promoted on the ground of the expediency of enabling persons who have occasion for the services of architects, civil engineers, or surveyors, to distinguish between those who are qualified and those who are not qualified to practise as such. The attempted legislation was absolutely unnecessary; it showed a complete ignorance of the safeguards that already exist, and its operation could only have been mischievous. So far as our profession is concerned, any compulsory examination held for the purpose of granting the right to practise only, must of necessity have been of a much lower character than the Institute examination; and it should be borne in mind that a person who had managed to pull through so as to be placed on the register would, in the eyes of the general public, have been exactly on a level with the most accomplished architect. Altogether the Bill was full of inconsistencies, and I am glad to be able to say that this Society gave its hearty support to the opposition, which was headed by the chartered societies of all the three professions with which the Bill proposed to deal.

The address to architectural students which is shortly to be issued will, I hope, be found of much value to them. No efforts have been spared to make it as complete as possible. In it the experience of the older members of the profession has been freely placed at the disposal of those who are preparing to succeed us, and if it is found to be of service in assisting them in their studies, I am sure that those who have devoted much time and labour to its compilation will feel themselves amply rewarded.

There are other subjects which invite comment—such as the proposed institute of art and industry, in which, as at present contemplated, the school of art and the technical school are to be merged, and in whose scheme architectural teaching and training will no doubt have a place—but I have already trespassed sufficiently upon your patience. There is clearly an awakening of public spirit in our midst. The great enterprises now on foot or in process of inception cannot fail to bring a considerable measure of prosperity to our profession; and I feel assured that the work entrusted to its members will be accomplished in a manner that will add to their reputation, and be worthy of the best traditions of our art.

### BUILDING IN ROME.

THE British Consul has presented the following report to the Foreign Office on the extension of Rome and the building crisis:—

The year 1887 marked a period of serious trial in the economical and building progress of the capital of Italy, and it may not be void of interest to relate the most prominent facts connected with this crisis, especially now that its effects, though not all manifest, can to a certain degree be measured.

It has been justly remarked that in the house-building speculation, which at present constitutes the most relevant factor of commercial activity in Rome, the capital and exertions of seven different classes of people concur: (a) the owners of building ground, who in the majority of cases have concentrated in their hands vast lots of ground, which they subdivide and resell freehold, exclusively for building purposes; (b) the builders, who are generally the purchasers of that ground, paying down only a small sum, and undertaking to pay the rest by instalments; (c) the lenders of money to builders; these lenders are very often the owners of the ground themselves, who guarantee their credit on the value of the property, including the building in course of construction; the money is lent in the shape of promissory notes; (d) the workmen; (e) the firms who supply various building materials, fixtures, &c., principally on credit; (f) the lenders of current cash to builders likewise in the shape of bills; and finally (g) the Institutes of *Credito Fondiario* (Mortgage Banks) that intervene when the building is finished, and grant loans on mortgage up to an amount equal to half the estimated value of the property.

The cause that determined the crisis I allude to was a sudden stagnation of credit throughout Italy during the second half-year of 1887, which was attributed to various circumstances, foremost the excess of credit granted up to then; but the main origin of the crisis, as regards house-building in Rome, is to be attributed to the want of capital and lack of business capacity on the part of the builders. These belonged, or rather sprang up, from the most different, and some from the most humble, classes of society, allured by the facilities afforded to the building speculation, and by the encouraging results which had been obtained by builders during the first years of the building activity. It should be noted that building ground was then sold at reasonable prices, and a house when finished used to cost, including the area on which it was built, 55 or 60 per cent. of its estimated value, reckoned according to the average of rents. It was very easy under these circumstances for builders to sell at 70 or 80 per cent. of the said estimated value, and the result was a profit on the builder's side of between 10 to 15 per cent. As the cost of building ground

increased, and the main conditions of the enterprise underwent a notable change, the cost of a house rose to 80 and 90 per cent. of its value taken on the basis of the rents. Whilst the would-be profits of the builders were thus considerably straitened, the selling of houses to real investors became also difficult, unless builders would give up every profit for themselves and sell probably at a loss. An exorbitant quantity of bills deluged the market in the latter part of 1887, while the discounting of bills abroad was hindered on account of the high rise of the exchange against Italy, which reached 170 per cent. The fears entertained by foreign bankers as to the state of the building trade in Rome, as well as the limitation of discounts by the local banks, joined to the panic which seized the firms supplying the building materials, brought difficulties to a climax, and the crisis in a short time reached an acute stage. The artificial element of the speculation, or of sheer gambling by would-be millionaires, came thus to the ground. Foremost among the sufferers from the effects of this crisis are the builders, the suppliers of building materials, and the current cash-lenders, for all whom the property constituted no security. As for the other classes afore-mentioned, the crisis, it appears, is only a temporary hitch. In order to meet the requirements of the situation the banks and firms interested in the matter have already taken steps for getting in fresh capital.

The sudden check in the sale of building ground will be, however, severely felt by the said banks and firms. In order to give an instance of this, I may mention that one bank alone, at the end of 1887, had on hand 192,236 square metres of building ground, nominally disposed of, but the transfer of which had not been actually carried out by the fault of the purchasing parties.

The class of builders is very numerous. One of the banks that is entirely dedicated to the building speculation counts amongst its clients no less than 350 builders. One builder, perhaps the foremost amongst the rest, became a bankrupt, with liabilities amounting to 50,000,000 francs (2,000,000*l.*), partly covered by the assets, represented by ground and buildings in course of construction.

It is doubtful whether this state of things may properly be called "over-building," especially if one considers that with the slackening of the construction of new buildings house-rents became still higher. This shows that the extension of the town answers to a real want of the population. It is to be observed that very few of the houses in course of construction are left unfinished. The construction of houses is now conducted with less feverish alacrity, and no important new blocks of buildings have lately been undertaken; still the work already begun proceeds regularly, and the greater part of the buildings in course of construction are brought to completion.

Intimately connected with all this is the constant increase of the population of Rome, which may be reckoned on an average to be 18,000 to 20,000 souls every year, as well as the demolition of houses both by Government and municipality, which compels thousands of citizens to shift to the new quarters. It thus happens that the banks that are mostly interested in the building speculation earnestly hope to be able to overcome, with no serious pecuniary losses, the present crisis, much more so that credit was by them granted on the security of property, not of persons; and no considerable fall in the value of the ground, nor of houses, has taken place.

In the month of November 1887, several lots of ground situated in that part of the town known as "Prati," close to Castel S. Angelo, were sold by auction, and the price they fetched was:—

	Price.	
	Currency.	Sterling.
	Lire.	£
Per 19,011 square metres .	1,838,000	73,520
" 17,701 " .	2,015,000	80,600
" 10,446 " .	1,765,750	70,630
" 11,102 " .	1,992,750	79,710
" 58,260 " .	7,611,500	304,460

The average for each metre is 130.60 lire (5*l.* 4*s.* 6*d.*).

In May 1888 the expropriation of a large palace (3,130 metres of surface) situated in the centre of Rome, on the Piazza Colonna, was valued at 735 lire (29*l.* 8*s.*) per square metre, and the vendor accepted the condition of taking back a portion of the area, if so desired by the municipality, at a minimum price of 750 lire (30*l.*) per square metre.

Brickmaking, in which large capitals are invested, is one of the most compromised in the building crisis, not only on account of the check which the manufacture of bricks, that was already surpassing the limits of demand, is going to sustain, but also for the serious losses deriving from unsatisfied credits granted to builders.



I find in a report published by the local Chamber of Commerce that in 1886 there existed fifty brickyards in activity, forty of which were provided with furnaces, Hoffmann's system, and the other ten following different methods of manufacture. The total brick production might have reached 280,000,000 bricks in 1887. No less than 10,000 workmen and 800 carmen found employment in this branch of the building industry. Thus, calculating that bricks represent less than 40 per cent. of the materials used in buildings, the rest being tufa, cement, mortar, &c., the quantity of bricks above alluded to would be proportionate to 2,500,000 cubic metres of masonry to be constructed every year.

The following are the various building materials introduced in Rome during the years 1881-86:—

Years.	Cement, Tufa, Flint.	Lime and Chalk.	Bricks, &c.	Various Stones.
	Cub. Mètres.	Tons.	Number	Cub. Mètres.
1881 . .	275,000	39,800	52,000,000	4,225
1882 . .	319,000	41,400	61,000,000	6,100
1883 . .	348,000	52,100	78,000,000	4,990
1884 . .	498,000	68,500	88,300,000	6,186
1885 . .	769,000	94,000	118,000,000	9,247
1886 . .	1,035,000	123,000	144,000,000	12,554

The total value of above materials may be calculated for the year 1886 at 16,000,000 lire (640,000*l.*), of which 4,000,000 represent the value of cement, tufa, and flint, 7,000,000 that of bricks, 3,000,000 that of lime and chalk, and 2,000,000 other stones. In the latter are not included the stones, such as marble, granite, &c., that are brought from other mining districts.

### THE LONDON SCHOOL BOARD.

THE committee of the London School Board, consisting of the whole Board, appointed to investigate any allegations of corruption, met on Tuesday, the Rev. J. R. Diggle, chairman.

In response to the inquiry directed to all members of the Board, whether they had information of any charge or fact of bribery, collusion, or other corrupt practice affecting any member or officer of the Board, twenty-four replies had been received, and were read. These stated in effect that they had no information on the subject. The chairman submitted a letter received from Mr. John Walsh, of Leominster, dated June 20, 1888, as follows:—"Now that the Metropolitan servants are being found out, how about the School Board? I know your servants. Some of them get builders to newly build their houses, and for passing their (builders') accounts only. I know some of the builders in jobbing department charge for more lead, more wood, more solder, in three months than they have used in two lustrums. If you searched their books you would be amazed. I remember being asked to make up one quarter's account for a firm a few years ago. The prime cost was about 2*col.*; the amount against the Board nearly 8*ool.* *Multum in parvo.*"

It was stated that the chairman wrote to Mr. Walsh on June 23 asking for names and dates, and had received no reply.

Mr. W. Bousfield stated that had he possessed any such information he should have communicated it to the Board. From the position which he held as Chairman of the Works Committee and of the Special Committee of Inquiry into the Works Department, he believed that if corruption had existed among the officers of the Board it would have been brought to his notice during the careful inquiries which had recently taken place. There had undoubtedly been scamped work in the erection of some of the schools, and this must have been known to the clerks of the works employed by the Board to supervise the building. None of the officers now in the employ of the Board were responsible for cases of dishonest building. He believed the Board were fortunate in being served by a staff of honest, able, and hard-working officers, and that the general high tone which ran through the office under Mr. Croard's leadership made a spirit of corruption impossible.

Professor Gladstone said he had no such knowledge. During the fourteen years, however, that he had been connected with the Works Committee it had come under his notice that attempts had been made to influence officers of the Board, but, as far as he knew, without effect.

Mr. Helby stated that he had not made any such charges or allegations as those attributed to him by certain members of the Board, and having already made a personal explanation to the Board, he had nothing further to add. With regard to any information he might have in his possession, having in view the abortive inquiry of the Metropolitan Board of Works, conducted by a committee of its own members, and the painfully successful result of the inquiry conducted by the Royal

Commission, he did not purpose making any statement except before a Royal Commission.

The committees of the Board wrote that they had no knowledge of bribery, collusion, or other corrupt practice.

The replies from the public were then read.

Mr. Hindley, of 290 to 294 Oxford Street, W., wrote that briefly his case was this. Being invited to tender for some work, he heard, while preparing the estimate, that it was all arranged that another firm was to have the work. He informed one of the responsible School Board officials of this before the estimates were sent in, and was assured that there would be fair play, but he was surprised to find that what he had stated was actually carried out, though not by quite the same means as he had expected; and although his estimate was settled upon by the committee another estimate was afterwards produced and accepted by the Board. That estimate was the one from the particular firm which he had heard it was arranged should have the work, and who did not manufacture their own work. The treatment he received from one of the School Board officials when endeavouring to inquire into the matter confirmed the opinion he had already formed as to the method in which the work of the Board was done. Mr. Hindley added that he saw a good deal of time was likely to be wasted and trouble given to those who volunteered evidence, and therefore he had decided to let the matter stand where it was, but he should be prepared to come forward to give evidence when the whole subject was before a Royal Commission. In a second letter Mr. Hindley stated that his tender was the lowest, but that after it was accepted another tender was "discovered" which was lower; and that when he called at the offices for an explanation he was kept waiting two hours, and then refused all information, being referred to "the person who gave him the rest of the information."

Messrs. Cox & Wooland, Benham Grove, Thornton Heath, drew attention to the tenders for the Holydale Road School at Nunhead, asking why their tender of 109*l.* was passed, and another of 135*l.* accepted, when in almost every other case the lowest tender was accepted. The letter added, "perhaps, had ours been a big firm, with a little influence behind us, we might have been in the know a little earlier." Mr. F. Morgan, of 138 Bermondsey Street, S.E., stated that his mother had sold four freehold houses to the Board in 1885, and 5 per cent. was allowed till the time of settlement. He asked if that was the correct amount the Board was charged with, as it seemed a small sum, and deprived the widow of half her income.

Mr. R. Broad, of Sunderland, wrote that the Board had advertised for a clerk of works at 6*l.* a week, and though he had offered his services at 3*l.* a week he was rejected. As a builder of many years' standing he could have given useful information as to foundations of certain schools, which would have saved the Board many thousands of pounds, and he added, "I write this to show how easy it is to make a mistake in your choice."

Mr. J. M. Smith, of the Borough, wrote that he could furnish the "Commission" with the particulars of the proceedings of an officer of the Board, who invariably received three payments upon the large amounts included in the estimates as provisional sums. This was accomplished as follows:—His commission included a percentage of provisional amounts, and was paid from the first instalments received by the contractor. When adjusting the accounts a deduction was made of all the provisions, and 2½ per cent. was claimed upon the deductions. Another charge was made upon the net amount expended out of the provisions. A statement should be called for from the various builders to show the amounts paid to the surveyors for squaring up schools. It would be found that the official in question generally managed to get 50 per cent. more than other similar officers. The largest school fell to this gentleman, probably owing to his intimacy with another official. The letter concluded by expressing the hope that full inquiries would be made, which might unearth more mysteries, especially if a cheque book were called for.

The Chairman said the business now before the committee was the action they should take in reference to the communications received.

Mr. Gover thought it was very unsatisfactory that out of fifty-five members only twenty-three should have replied, and he moved that the rest of the members be requested to answer.

The motion was not seconded, and fell to the ground.

Colonel Hughes, M.P., remarked that the only thing for the committee to do was to say that there was no declaration of fraud of sufficient importance for the committee to take action upon. The matters brought before the committee in reference to the advertisements appeared to be very insignificant, for it might naturally be supposed that with a Board like theirs, spending 8,000,000*l.* or 9,000,000*l.*, there would be somebody upon whose toes they had trodden. No doubt there were matters, and always would be, in which a Board like that made mistakes, but all these matters of administration had been dealt with by the committees concerned. There appeared to be no charge against the Board, and as it was not for the com-



mittee to prove a negative, he should move that the various complaints received be reported to the Board, with the recommendation that they be referred to the various committees concerned; that the action taken by the committee be reported; that the Works Committee be instructed to forward the return as to what persons had sold more than one property to the Board, direct to the Board, and that the reference to the committee be discharged.

Mr. Barnes seconded the motion.

The motion was agreed to, Mr. Gover recording his dissent.

### ART CONGRESS AT LIVERPOOL.

A MEETING of the General Committee to arrange for this Congress took place on Monday in the Town Hall, under the presidency of Mr. P. H. Rathbone. A report was presented by Mr. H. E. Rensburg, the local hon. secretary. It stated that Sir Frederick Leighton, P.R.A., had given his support to the scheme, and had promised to become the president of the Congress, which is to be divided into six sections, namely, painting, sculpture, architecture, applied art, art history and museums, and national and municipal encouragement of art. The sittings of the Congress, it is proposed, shall extend over five days, and it had been arranged that the meetings should commence on Monday, December 3, in St. George's Hall. Owing, however, to the uncertainty as to the date of the autumn assizes, this arrangement may have to undergo an alteration, and the Congress may probably open a fortnight earlier. A programme of the week's engagements has been provisionally drawn up. On the Monday—the first day—Sir Frederick Leighton, Bart., will deliver his presidential address, and on the following days meetings will be held, morning and afternoon, of the various sections. On Tuesday Mr. G. Aitchison, A.R.A., president of the Section of Architecture, is to deliver an address in the morning, and there is to be an address in the afternoon by Mr. L. Alma Tadema, R.A., president of the Section of Painting. On Wednesday addresses are to be given by Mr. Walter Crane, president of the Section of Applied Art, and by Mr. Alfred Gilbert, A.R.A., president of the Section of Sculpture. On Thursday an address by Mr. Sidney Colvin, president of the Section of Art, History and Museums; and on Friday the Right Hon. A. J. Mundella, M.P., will deliver an address as president of the Section of National and Municipal Encouragement of Art. In addition arrangements are being made for combined meetings of certain of the sections. The report of the secretary was adopted, and on the motion of Professor Conway, seconded by Mr. F. J. Leslie (an additional hon. secretary), a finance sub-committee was appointed. Professor Conway stated that a sum of 1,000*l.* would be required for the Congress. The city of Liverpool had been pledged in a very prominent way before the whole nation in respect of the Congress, and leading men in all the branches of art had been invited to come down. It was therefore essential that they should exert themselves to get sufficient money to carry out their pledges. Local secretaries for the various sections were afterwards appointed. The Chairman said that during the last few years Liverpool had not taken that place among the great towns which she ought to do, and if she was to maintain the position of second city of the empire it was of great and serious importance that the forthcoming Congress should be made a real success. Another meeting of the committee will be held at an early date.

### TESSERÆ.

#### Works of Art in Schools.

J. RUSKIN.

THE first and most important kind of public buildings which we are always sure to want are schools, and I would ask you to consider very carefully whether we may not wisely introduce some great changes in the way of school decoration. There certainly comes a period in the life of a well-educated youth, in which one of the principal elements of his education is, or ought to be, to give him refinement of habits, and not only to teach him the strong exercises of which his frame is capable, but also to increase his bodily sensibility and refinement, and show him such small matters as the way of handling things properly, and treating them considerately. Not only so, but I believe the notion of fixing the attention by keeping the room empty is a wholly mistaken one. I think it is just in the emptiest room that the mind wanders most, for it gets restless like a bird for want of a perch, and casts about for any possible means of getting out and away. And even if it be fixed, by an effort, on the business in hand, that business becomes itself repulsive more than it need be by the vileness of its association, and many a study appears dull and painful to a boy, when it is pursued on a blotted deal desk, under a wall with nothing on it

but scratches and pegs, which would have been pursued pleasantly enough in a curtained corner of his father's library, or at the lattice window of his cottage. Nay, my own belief is that the best study of all is the most beautiful, and that a quiet glade of forest, or the nook of a lake shore, are worth all the schoolrooms in Christendom, when once you are past the multiplication table; but be that as it may, there is no question at all but that a time ought to come in the life of a well-trained youth when he can sit at a writing-table without wanting to throw the inkstand at his neighbour, and when also he will feel more capable of certain efforts of mind with beautiful and refined forms about him than with ugly ones.

### The Velarium of the Coliseum.

E. CRESY.

Lampridius (in *Com. a Militibus, Classiariis*) informs us that the management of the vela was left entirely to sailors, as they were more expert in going aloft amidst ropes, and understood the tackle which regulated the spreading of it better than others. There can be no doubt that it required considerable dexterity on the part of the engineer to keep steady an awning containing 113,345 superficial feet, which would be required for the amphitheatre at Nîmes, and for the magnificent Coliseum nearly 250,000 superficial feet, or more than double; the weight of which, at only one pound per foot, comprising the ropes and tackle, would amount to 112 tons or thereabouts. So vast a weight, disposed and upheld by tension alone, creates our wonder and admiration. At the level of the attic storey are 120 projecting consoles, each having a circular hole about 10 inches in diameter corresponding with a circular mortice of the same size, and 6 inches in depth, made in the projection of the cornice of the second order. The upper opening of the hole in each console has externally a groove 2 inches in height, destined for an iron collar, to which was attached a tie, which secured it to the wall of the attic at the level of the top of the console. The holes which contained these have some portions of the iron run with lead remaining. The whole of each console received a round mast, which, passing through it, rested in a hole sunk in the cornice below, the iron collar preventing it from acting against the sides of the console and fracturing it. The masts alone would not be sufficient to support the weight of the vela, extending over an elliptical area, the axis of which, in one direction, was 436 feet, and in the other 331. To aid in the support, other posts were introduced through mortices about 10 inches in length, placed opposite each console, at the projecting part of the moulding which crowns the interior of the attic; on each side, 4 or 5 inches from the edge of the attic, are holes still containing the lead which secured the iron ties that held these latter posts in their places. Under the mortice holes are others, 8 inches square and 2 feet in depth, made in the upper step of the attic to receive the second posts. The two posts were afterwards securely braced. Over the centre of the arena was an oval covering, permanently fixed, which in the Coliseum was ornamented with an immense golden eagle. Round the edge of this oval covering was attached a large cable. One hundred and twenty pairs of cords, of equal length, stretched from the masts on the exterior to this cable, were worked by pulleys, thus forming as many compartments. Each pair of cords was furnished with rings, to which the covering was attached, so that it could be drawn backwards and forwards at pleasure. The whole of these were called the vela or velaria, and each single compartment velarium. The distance between the ropes on which the velarium ran was greater towards the attic than at the centre; consequently, to make the velarium run freely on its rings, it was necessary that it should be of an equal width throughout. When spread towards the attic it was stretched, whilst towards the centre it sagged, and formed, as it were, a fold. To prevent the sun passing through the opening thus made by the sagging, an internal hanging was attached around the fixed permanent oval.

### Sandstone as a Building Material.

J. CUMMING.

Sandstone in every case consists of larger or smaller particles of silica or flint, held together either by mere aggregation, by calcareous cement, or by oxide or carbonate of iron, and sometimes by silicious cement; the last-named are always the best and indestructible. The most homogeneous examples should be selected, and those free from iron. Sandstones, however, do not generally commend themselves for enduring qualities; but occasionally examples have been employed that have stood the test of centuries and remained uninjured. At the time when the Houses of Parliament were about to be erected, a committee was appointed to decide upon the most useful and lasting stone to build them with, and the prominent buildings of this country were examined as to their state of preservation and the length of time which had elapsed since their erection. Of the eleventh century, Chepstow Castle, partly built of old red sandstone, is decomposed; Durham Castle the same; Fountains Abbey and Kirkstall Abbey, both



much decomposed; and the only eleventh-century work mentioned as being built of sandstone, which is still sound, is Richmond Castle, even the mouldings and carvings of which are said to be in a perfect state. The examination was conducted through the prominent buildings of the twelfth, thirteenth, fourteenth, fifteenth, and sixteenth centuries, and the result was not sufficiently satisfactory to induce the committee to recommend sandstone for its durability. The sandstones used at the present time are better than those formerly employed. The Craigleith sandstone, from the carboniferous formation in the vicinity of Edinburgh, is the most satisfactory, as it contains 98 per cent. of silica, and only about 1 per cent. of carbonate of lime. The sandstones from the millstone grit of Yorkshire are good, and where used have lasted for centuries. A very hard and lasting stone (if well selected and used in dry places) is the freestone from the greensand rocks. In the neighbourhood of Godstone and Nutfield many buildings are constructed of it, and appear to last well. The same quarry, however, often yields various qualities of stone. Patteson Court, Nutfield, is built of this stone from a quarry on the property. The older portion of the house is in perfect condition: the more recent, although built of stone from the same quarry, is flaking off and crumbling away rapidly. The sandstones from the Wealden formation, notwithstanding some of them appear very hard, soon crumble to pieces, and should on no account be used for any building intended to last. This stone has little or no cementing material in it, unless (as in some cases) carbonate of iron, which would be better absent. Sandstone may sometimes be employed in situations where moisture is the rule, when in exposed places it would be liable to destruction by the atmosphere. In selecting sandstone for building, and, indeed, any stone, it is well to observe in any adjacent quarry how the undisturbed surfaces have behaved themselves on exposure to the weather. Experience must of course decide, for many sandstones that are soft in the quarry (when newly cut) become hard and very good afterwards.

#### English Wall-Papers in the Eighteenth Century.

J. G. CRACE.

Recurring to the subject as connected with this country, in the year 1754 a Mr. Jackson, a manufacturer of paperhangings at Battersea, published a work on the invention of printing in chiaro-oscuro, and the application of it to the making of paperhangings, illustrated with prints in proper colours. This book is a sort of advertisement of the kinds of papers made, and the mode of manufacture employed by him. He adopted a style of paperhangings executed with blocks in chiaro-oscuro, in imitation of the most celebrated classic subjects. To use his words, "The person who cannot purchase the statues themselves may have these prints in their places, and thus effectually show his taste. 'Tis the choice and not the price which discovers the true taste of the possessor; and thus the Apollo Belvedere, the Medicean Venus, or the Dying Gladiator may be disposed of in niches, or surrounded with a mosaic work in imitation of frames, or with festoons and garlands of flowers, with great taste and elegance; or, if preferred, landscapes after the most famous masters may be introduced into the paper. That it need not be mentioned to any person of taste how much this way of finishing with colours, softening into one another with harmony and repose, exceeds every other kind of paperhanging hitherto known, though it has none of the gay, glaring colours in patches of red, green, yellow, and blue, &c., which are to pass for flowers and other objects in the common papers." By the account of this gentleman we find that paperhangings were then in common use, and had reached a certain degree of perfection, for that even arabesques were executed; and I therefore conceive that the art discovered by Lanyer had been continued from his time to the present; particularly as in the year 1712, the tenth of Queen Anne, a duty of 1½d. per square yard is imposed on this manufacture. In the reign of that queen, the Chinese paperhangings were very much employed, and have continued in fashion to the present day. These hangings, though parts of them may be executed by blocks or stencils, are almost wholly painted by hand. Contemporary with Jackson, I have learned that a Mr. Taylor, the grandfather of one of our present most eminent manufacturers, carried on this business to a considerable extent, and accumulated a large fortune. He was succeeded by his son, who, I am informed visited France, and was enabled to give the manufacturers there considerable information. He said, on his return, that he found the French paperhangings very inferior to our own, both as to execution and beauty of design. In those days we had an extensive export trade in this material to America and other foreign parts, but we are now driven out of the market by the French. The paperhangings at that date, about 1770, were manufactured nearly in the same manner as at present. I have, indeed, seen a flock paper of a large rich damask pattern, more than one hundred years old, which resembles in every way the modern material; it is singular that this art of flocking was disused and almost lost during a

period of twenty years, and revived only about forty years ago; a mode of decorating papers was also formerly employed, which is now never adopted. I have seen papers ornamented with a substance commonly called frost, a species of talc. In the year 1786 there was established at Chelsea a manufactory for paperhangings of a superior description, conducted by Messrs. George and Frederick Echardts, gentlemen of considerable taste and spirit. The mode of manufacture was different to that in general use, for, besides the usual printing blocks, copper-plates, on which were engraved designs of great finish and beauty, were likewise employed, and they not only printed on paper, but also on silk and linen; and by an under-ground of silver or gold, they obtained very beautiful effects of colour. Only part of the design was given by printing; it was finished by artists constantly retained by the manufacturers, men of considerable talent, who, again, were assisted in the inferior parts by young girls of whom more than fifty were employed. And had this undertaking been supported by the Government, it would, I do think, have been more available as a school for our rising artists, and of infinitely greater service than our present school of design, for it would have been a working school, and no other, I am convinced, will be of any use in forming a talented race of decorative artists in this country. There was also about this time another establishment similar to the former, conducted by Mr. Sheringham, in Marlborough Street.

#### Ancient Use of Bronze.

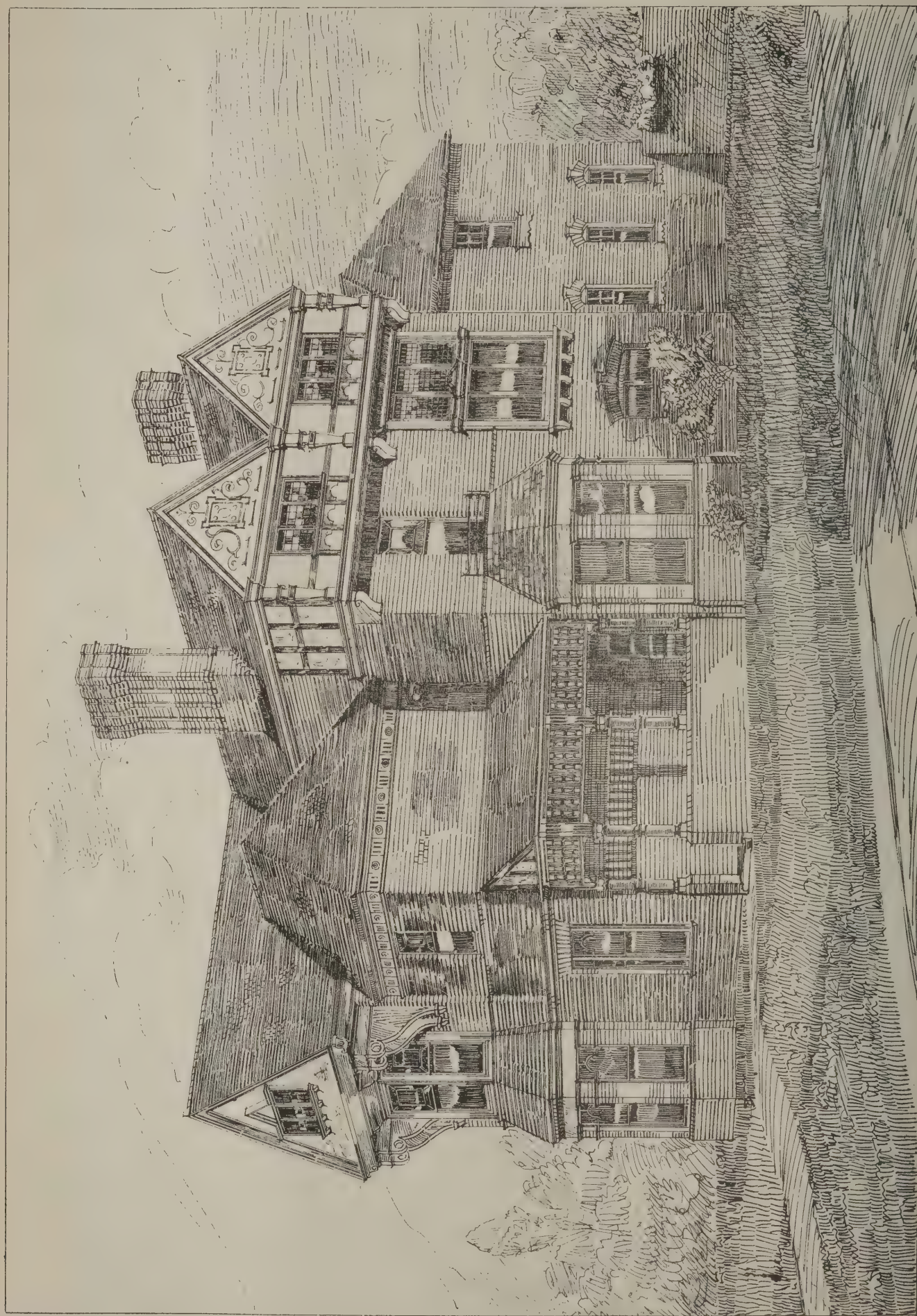
C. DALY.

In reading the travels of Pausanias in Greece, we cannot but feel surprised at the immense number of bronze works in sculpture which he meets with at every step, particularly when we recollect that the country had been in the possession of the Romans for three centuries, and that they had already, on several occasions, carried away thousands of bronze figures. Of thirty-three colossi described by the tourist, thirty were of bronze, the three others of wood; he also describes thirty-two equestrian statues of bronze and twenty-four chariots, at least of natural size, sometimes with two, and oftener with four horses, and holding one or two figures. Some were accompanied by runners or grouped with men on foot who led them; in fine, he mentions more than forty animals of considerable size, also of bronze. And yet Pausanias only visited a part of Greece. It was of bronze that the Athenians, after the death of Pisistratus, formed the first quadriga, in memory of their fellow countrymen who died while fighting for their native land. The Romans made frequent use of bronze, and like the Greeks, employed it in the form of candelabra, lamps, furniture, triclina, altars, tripods, tools, fastenings, letters for monumental inscriptions, window fastenings, &c. The doors were sometimes plated with bronze, secured with nails of the same metal; such as those of the Pantheon. Pliny (B. 34, sec. 7) says that the ancients were accustomed to make the threshold and gates of temples of bronze. Ancient gates entirely formed of bronze are still to be seen in the church of St. Cosmo and St. Damian in the Forum at Rome, formerly the temple of Romulus and Remus, and this luxury was not exclusively confined to temples, for, 380 years before our era, the ornaments were of bronze on the doors of the house of Camillus. By means of cramps large masses of bronzed ornaments and carvings were fastened on monuments by way of decoration. On bronze tablets were engraved laws, treaties of peace, and public acts intended to be made known to posterity. Three thousand of these tablets were destroyed in the fire of the Capitol, in the time of Vespasian. Capitals were also made of bronze, which were secured on cores of stone. Pliny relates that "C. Octavius, who conquered Perseus in a naval action, erected, in honour of his triumph, a double portico, which was called Corinthian, because the capitals of the columns were of bronze; this portico was near the Flaminian Circus; the capitals of the Pantheon, placed there by Agrippa, are of the same metal." The Romans further applied bronze in the execution of works on a large scale; the framing of the Pantheon was constructed of bronze, and, according to Serlio, who had examined it in its place, the different pieces were hollow; they were put together in the same way as woodwork. The caissons of the vault of this monument were also of bronze, and the circle which frames the opening by which the Rotunda is lighted still remains. In the baths of Caracalla the ceiling of the immense hall known as the Cella Solæaris was formed of a network of bronze; a fact of which M. Blouet did not seem to be aware when he published his restoration of that monument. The ancients also constructed roofing of bronze, for, 212 years before the Christian era, the temple of Vesta, at Rome, was covered with tiles of bronze, and so, at a later period, was the Pantheon. As to bronze statues, there was at Rome a number truly prodigious, brought from all the great cities of Etruria, Greece, Sicily and Asia Minor. Scæurus having erected a temporary theatre at Rome, towards the end of the Republic, decorated it with three thousand of these statues.







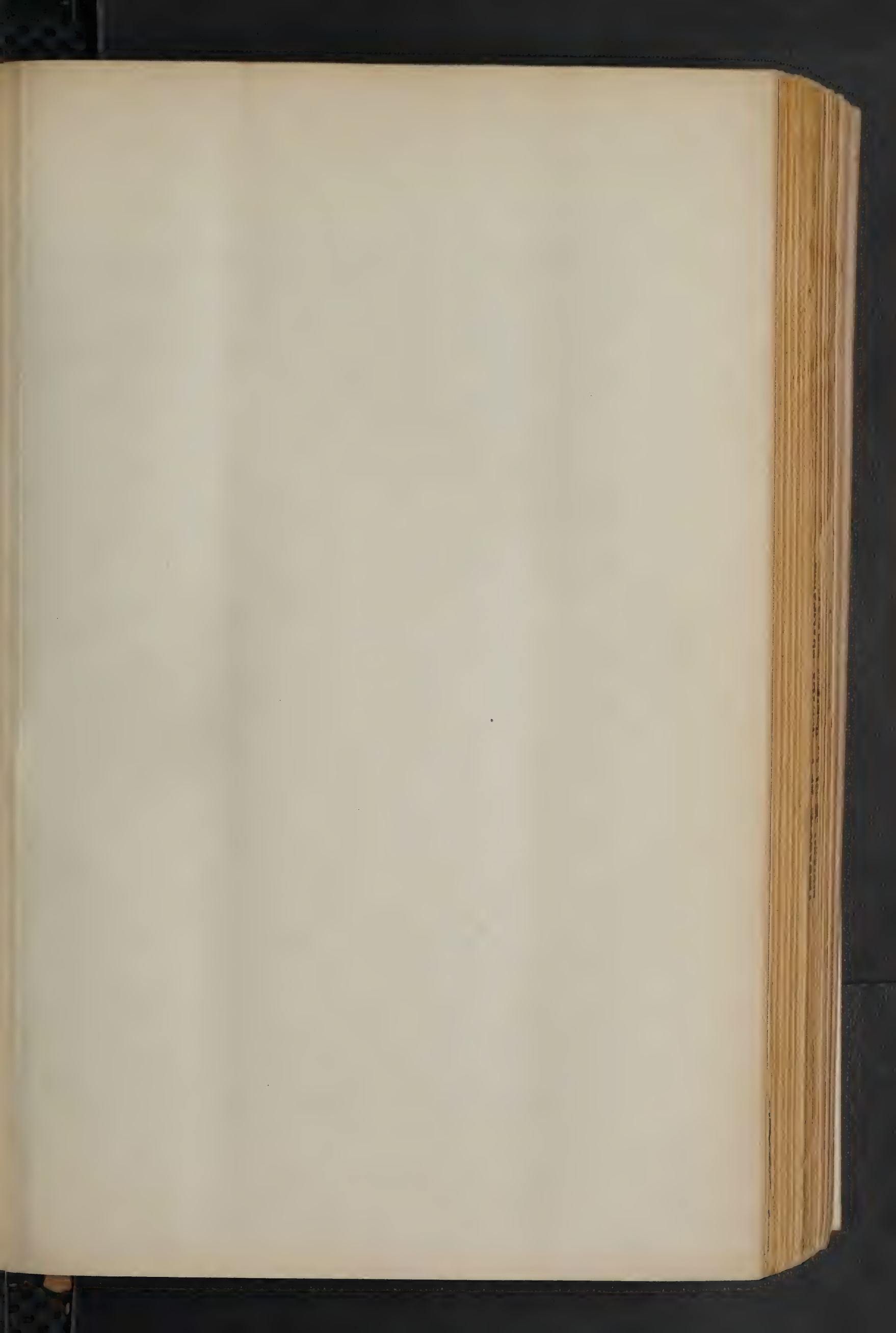


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RESIDENCE, SUNDRIDGE PARK AVENUE, BROMLEY, KENT.

MR. CHARLES BELL, F.R.I.B.A., Architect.









THE LAST PRAYER

From the painting by MICHELANGELO

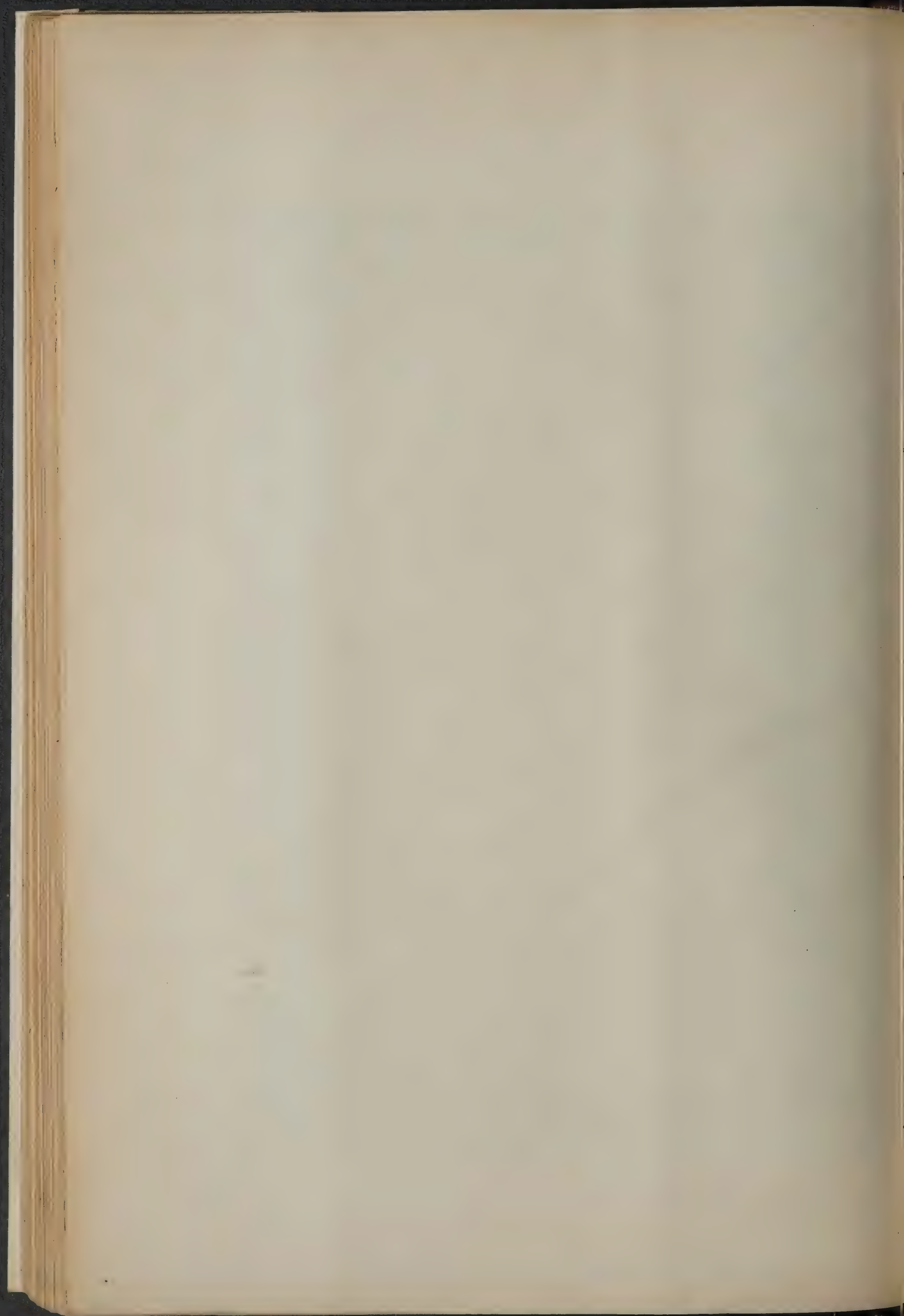




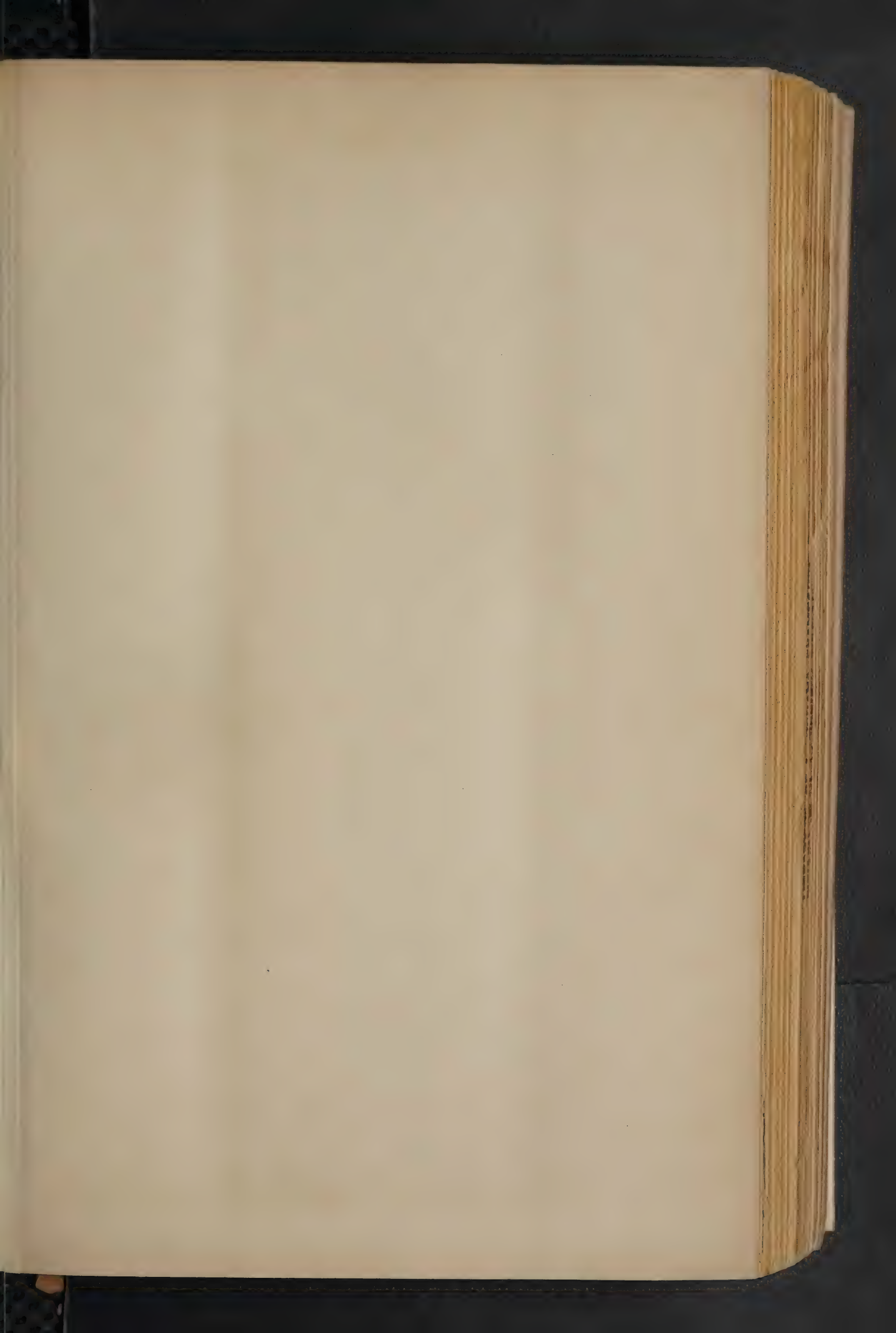
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THE CONDEMNED.  
VON DER OUDERAA

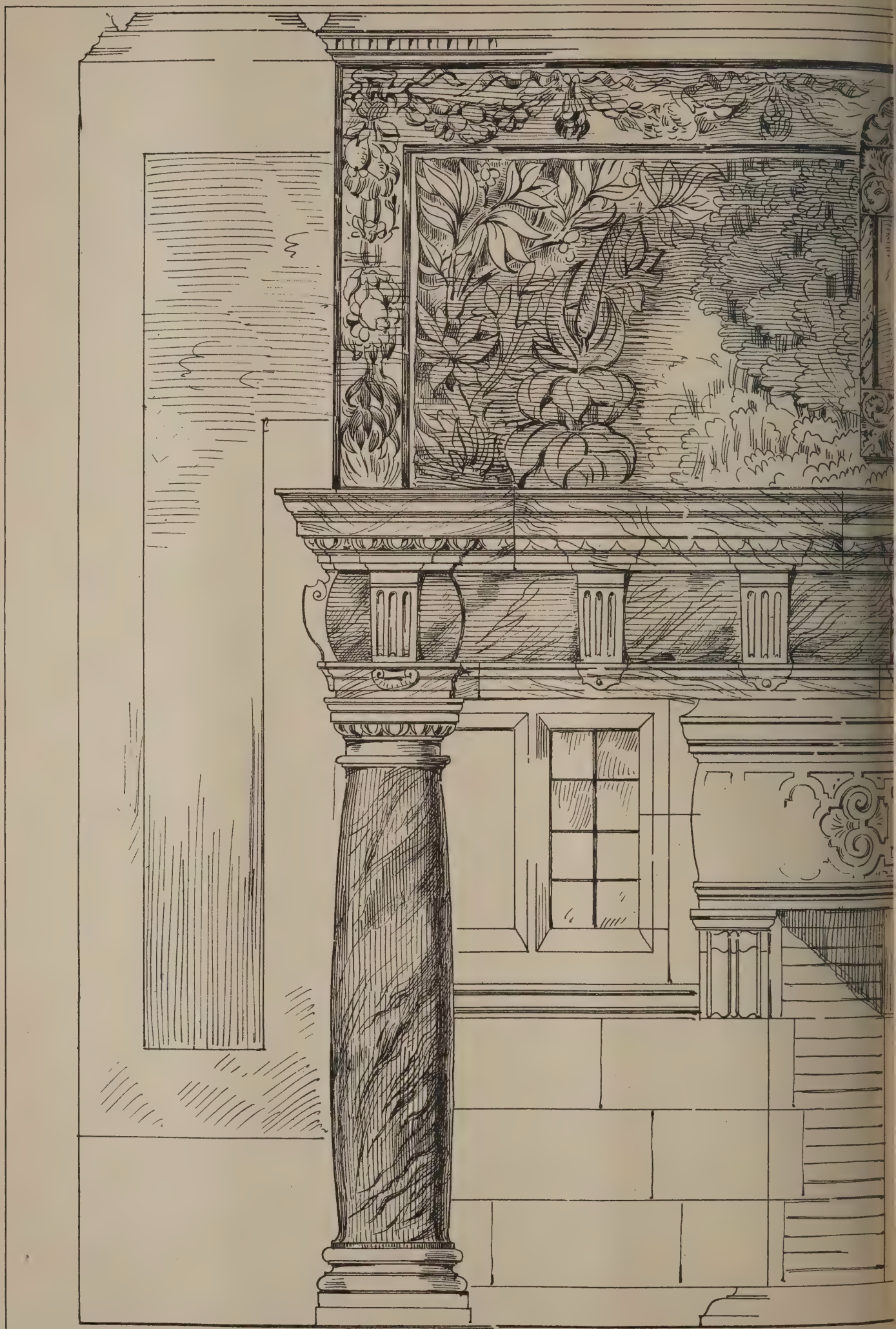






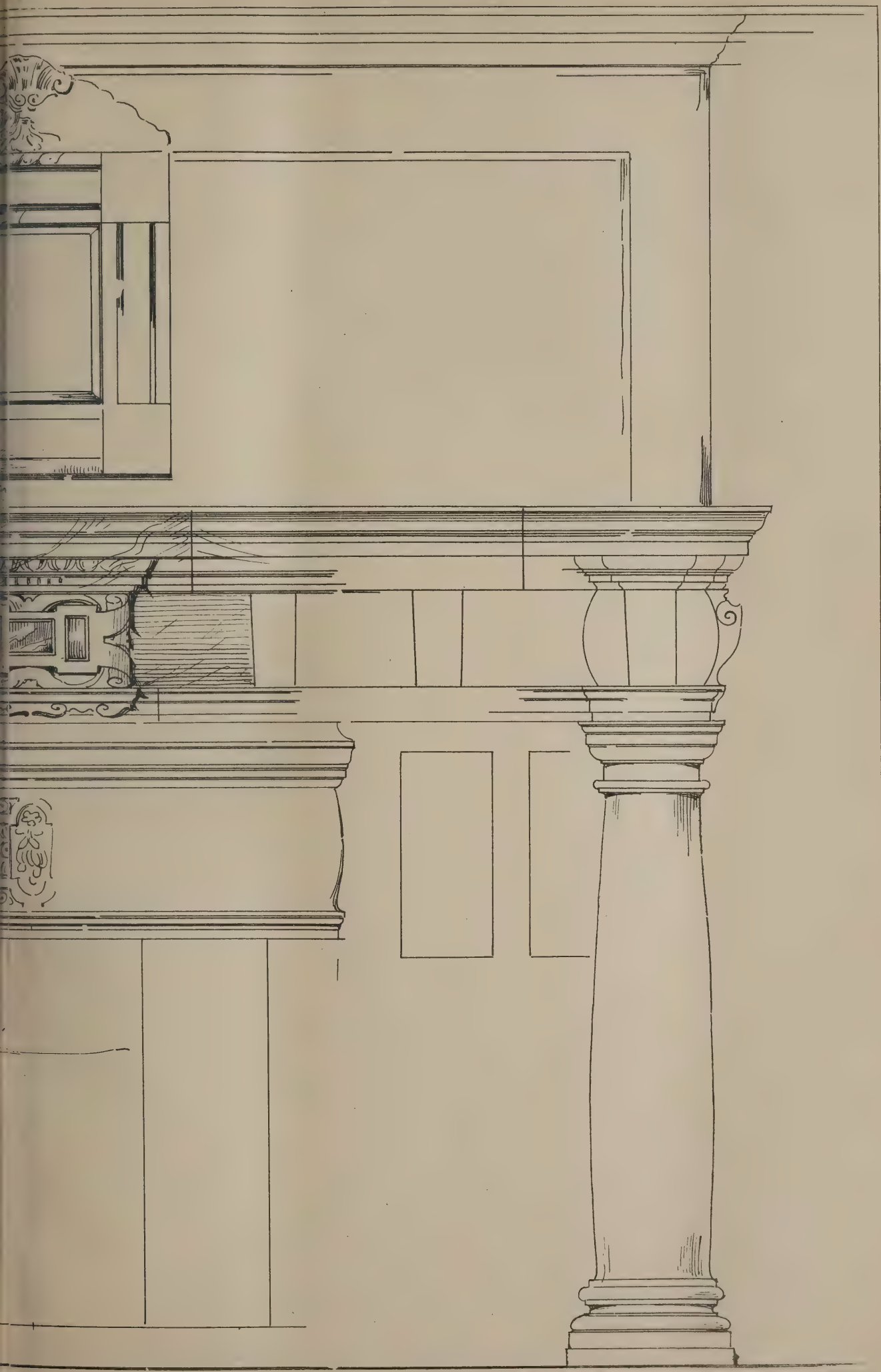




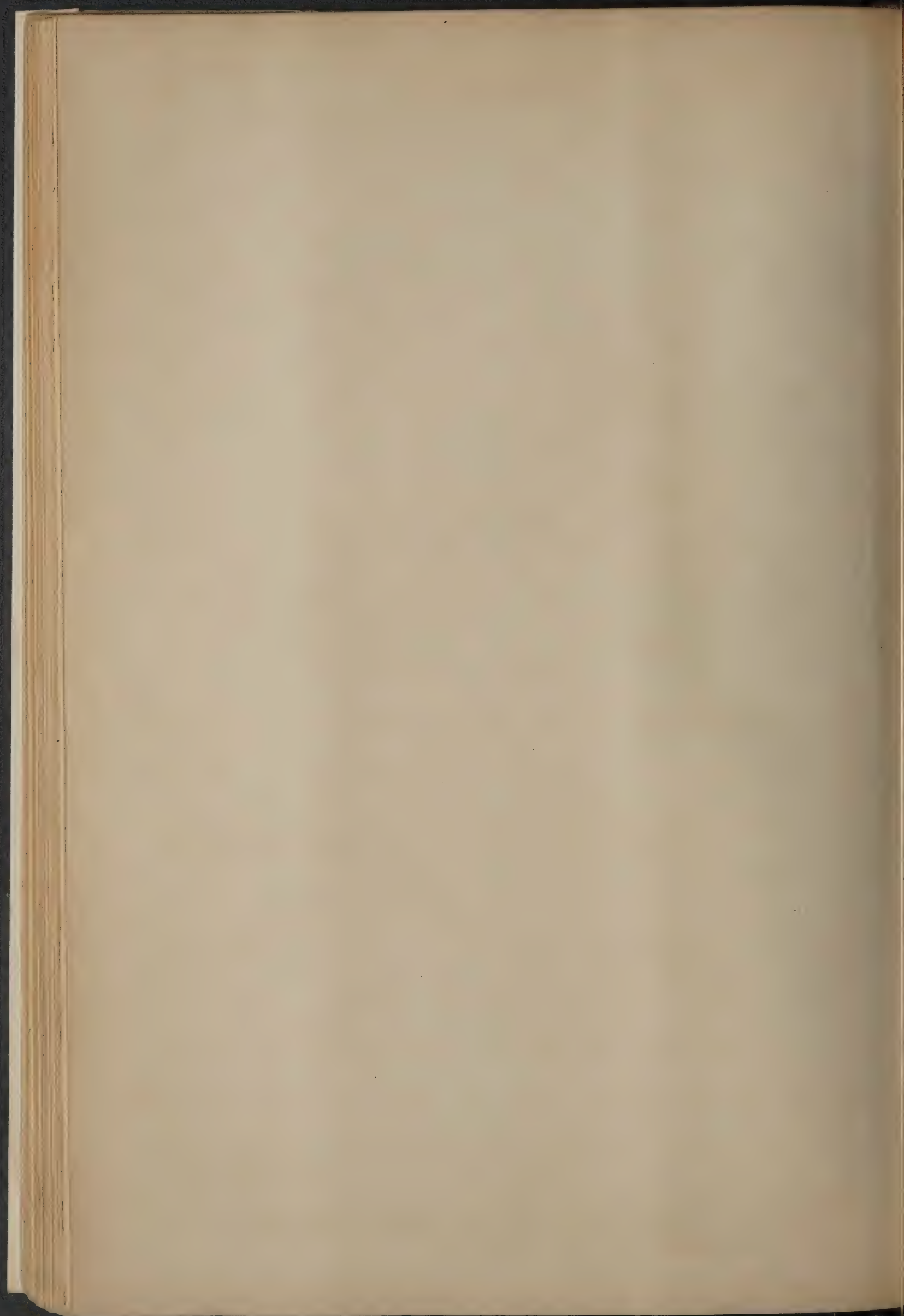


CHIMNEY PIECE,  
R. NORMAN SHA

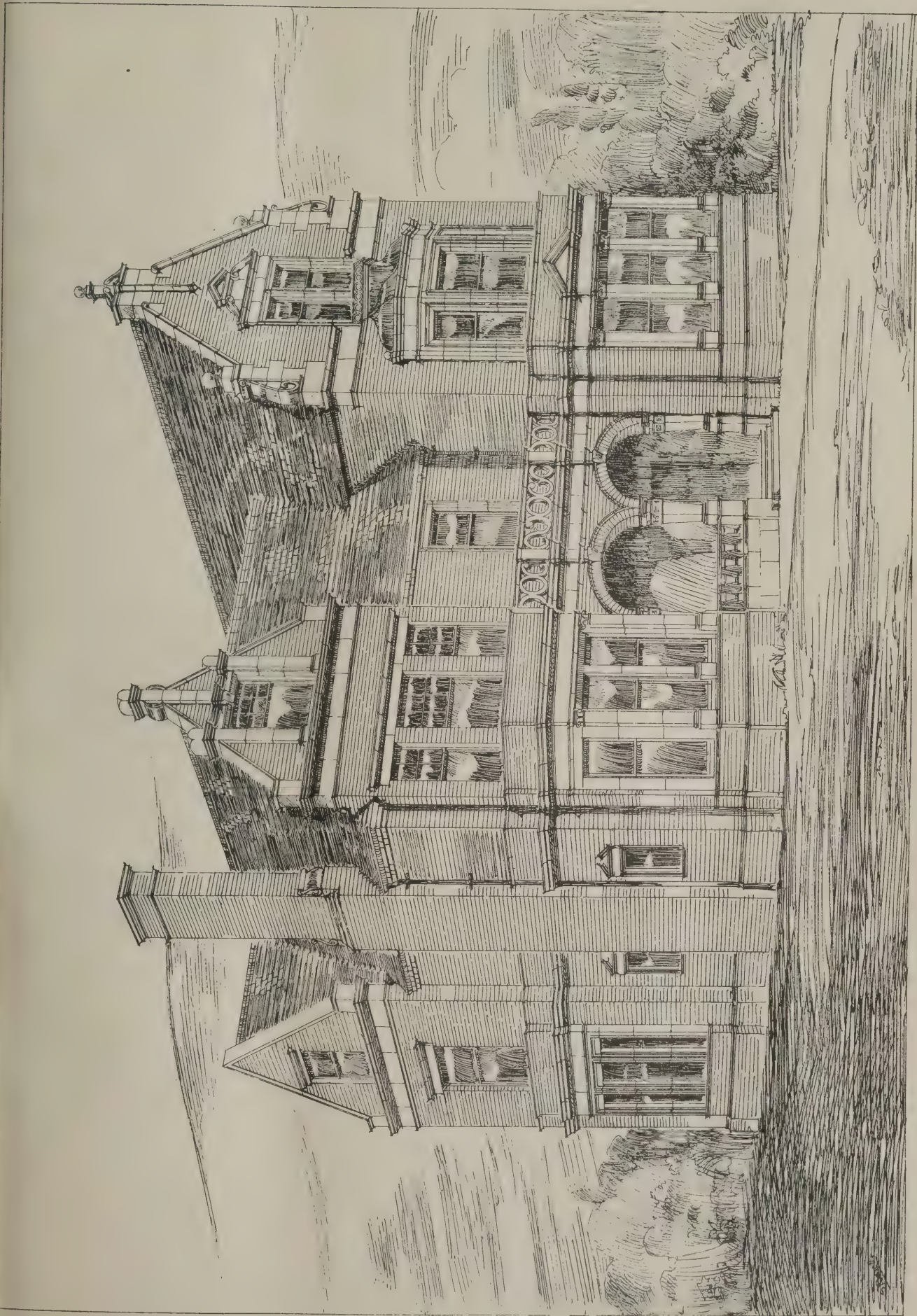








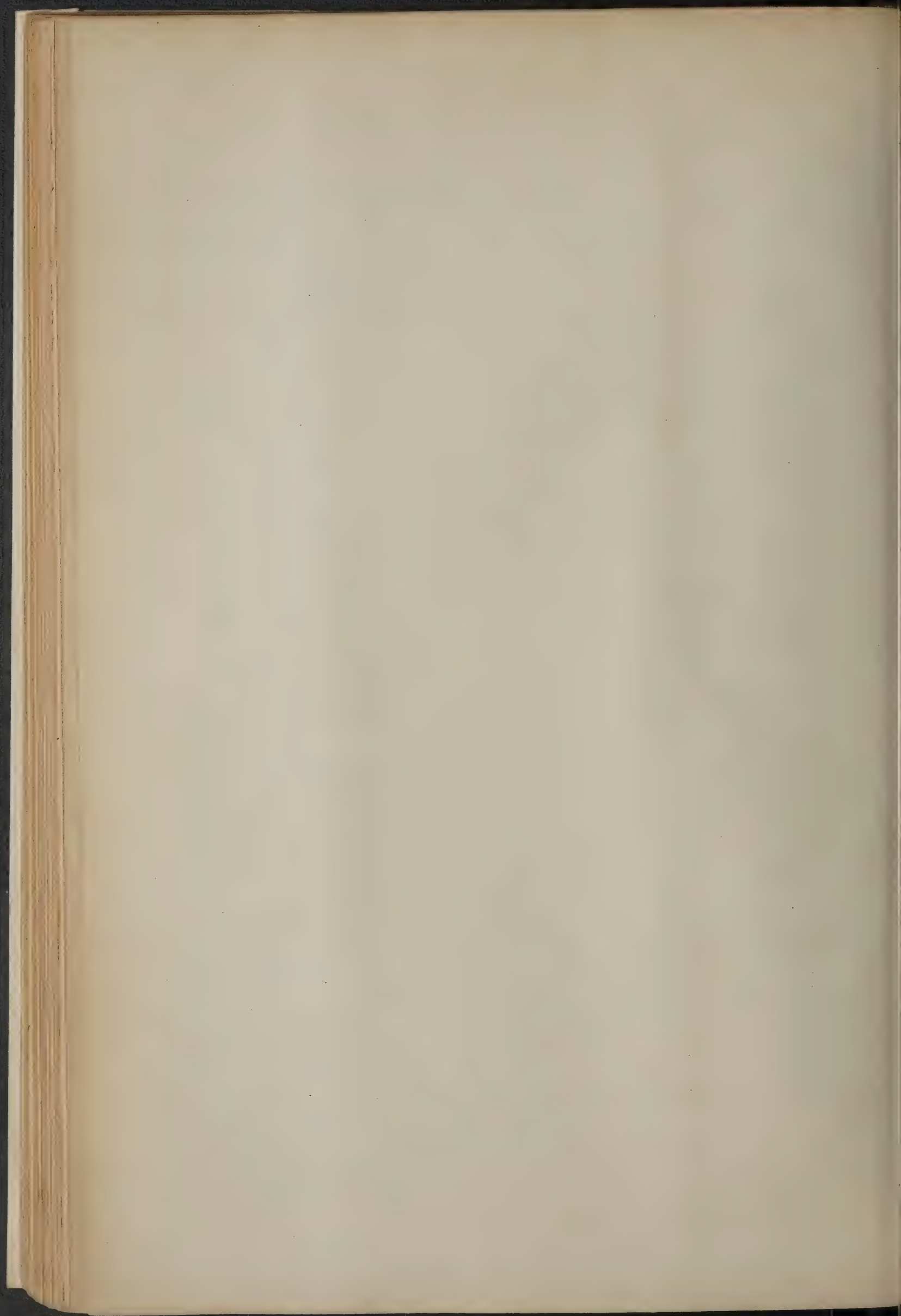




RESIDENCE, SUNDRIDGE PARK AVENUE, BROMLEY, KENT.  
MR CHARLES BELL, F.R.I.B.A., Architect.

Designed by Mr. C. Bell, F.R.I.B.A., Architect.







## ILLUSTRATIONS.

THE LAST PRAYER FOR THE CONDEMNED.

WHEN we published lately *The Kiss of Reconciliation*, by M. VAN DER OUDERAA, we remarked that the artist painted many pictures relating to the administration of the law in Belgium. The work we now reproduce is one of them.

It was the custom in Antwerp to have altars along the *via dolorosa* which criminals traversed on their way to execution. Prayers were said before the crucifix, in which the officers of justice and the populace joined. In the illustration it is supposed that the procession has reached the last altar, and as the woman can see the stake from the place where she kneels, she is too fascinated by the sight to take any part in the devotional service. A murderer would escape if he received a kiss from the representative of his victim, but for women who were supposed to be guilty there was no mercy. The law-makers were men, and the stake was made the penalty of crime that often was only imaginary. From such books as Fox's "Martyrs," it is plain that in England a woman was not spared any offering at the stake. Punishment was meted out to her by a judge, and both executioners and sheriff felt in duty bound to carry it out to the letter. But on the Continent there was consideration for feminine weakness: as the French judge said to the son of Madame DE SÉVIGNÉ, here were "certains petits adoucissements à cause de la faiblesse du sexe." Straw would be thrown over the woman's head in order to suffocate her, or a blow would be given in removing it which was likely to render her incapable to feel any pain afterwards. As Madame remarked when she heard the story, "To be burnt is not as terrible as one imagines."

In the picture we illustrate, as in the *Kiss of Reconciliation*, it will be seen that M. VAN DER OUDERAA introduces nothing which is suggestive of the stage. A student of the history of Antwerp and of its manners and customs, the past has to him the vividness of the present, and he can paint a historic scene as if he were one of the spectators, and had seen it from some coign of vantage.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 9.—CHIMNEYPIECE, DAWPOOL, CHESHIRE. [R. NORMAN SHAW, R.A.]

HOUSES, SUNDRIDGE PARK AVENUE, BROMLEY.

THESE are built from the designs of Mr. CHARLES BELL, F.R.I.B.A., of 3 Salters' Hall Court, Cannon Street, for Mr. W. DEACON. They contain three well-proportioned reception-rooms, vestibule and inner hall, kitchen, offices, &c., on ground floor, and eight bedrooms, and occupy about an acre of land in the best part of the avenue.

## WOLVERHAMPTON SCHOOL OF ART.

AT the special meeting of the Wolverhampton Town Council on Tuesday, the Mayor (Alderman J. Jones) in the chair, a report was received from the General Purposes Committee recording the resignation of the following members of the Art Committee:—The chairman (Mr. S. T. Mander), Alderman Thorne, Councillors Manley and Marston, Colonel Loveridge, Messrs. F. J. Badger, T. Beach, P. Horsman, W. H. Ince, H. G. Powell, C. Wells, and R. Williams; and subsequently of the Mayor, Sir Rupert Kettle, and the Rev. J. T. Jeffcock. The remaining members of the Art Committee are Alderman Bantock, Councillor Ironmonger, and Councillor Shepherd.—Alderman W. H. Jones moved the reappointment of the Art Committee, and the termination of the contract with the present headmaster. In support of his motion he quoted the recommendation of the late Art Committee, to the effect that no improvement in the position of the school would be effected until it was placed under a fresh headmaster. The late committee consisted of men representative of the manufacturing, the artisan, the educational, and the professional interests of the town—men who had given no less than 13,000% towards the funds of the institution.—Mr. Jenks, in seconding the resolution, said that the Council had to consider, not the prospects of Mr. Gunn, but the interests of the ratepayers. They had been

granted a penny rate for the promotion of art education in the borough.—Alderman Thorne moved a resolution asking the old Art Committee to continue in office; that one sub-committee, under the chairmanship of Alderman Bantock, should take the management of the School of Art; while a second sub-committee, presided over by Mr. Mander, should deal with the art gallery.—Alderman Bantock expressed approval of the compromise proposed, and seconded the amendment. He thought it necessary, however, that the contemplated School of Art sub-committee should consist of a larger number of persons than the minority of the Art Committee who sympathised with his action in the proposed dismissal of Mr. Gunn. Alderman Bantock, proceeding, accused the old Art Committee of issuing misleading statistics.—In answer to Mr. C. T. Mander, Alderman Thorne said that the chairman of the whole committee should be neither Alderman Bantock nor Mr. Mander, but some person who could hold the balance between the two opposing parties.—In reference to Alderman Bantock's suggestion, the Town Clerk said that the constitution of the Art Committee could only be altered by the election of fresh members to fill vacancies.—Mr. S. T. Mander, as the chairman of the old Art Committee, expressed his wish to entirely retire from the conduct of the School of Art and the Art Gallery after the personal abuse which had been directed against the committee, and the vote of the Council at its last meeting. The compromise suggested by Alderman Thorne was the less likely to succeed because of the difficulty which Alderman Bantock's conduct created in the way of a conciliatory treatment.—Mr. J. J. Tate inquired who had crossed out the names of the Art Committee from the circulars issued with reference to the coming exhibition to possessors of pictures desired for loan.—Alderman Major expressed his unwillingness to see the present system continued, and therefore objected to Alderman Thorne's proposal.—Mr. R. R. Rhodes supported the compromise.—Mr. Williams thought that the Art Committee had reported correctly, and said the present state of things was scandalous. Alderman Thorne's amendment settled nothing; Alderman Jones's resolution was tangible.—Mr. Bates complained that if any artwork modelling or chasing were required by a Wolverhampton manufacturer, it had to be done in London or Birmingham.—Mr. C. H. Cousins considered that as the committee were defeated they should have resigned. But Alderman Thorne had suggested a means by which the committee's connection with the art gallery would be maintained, while Mr. Gunn would continue his work in the School of Art.—Mr. C. R. Smith said that the compromise, like most compromises of the character, was unworkable.—In answer to Alderman Jones, Alderman Thorne said that one reason for his amendment was that if the proposed School of Art sub-committee were given sufficient rope they would hang themselves.—The amendment was then put, and carried by 25 votes to 11.—Mr. Mander said that the acceptance of the amendment by the committee would depend upon the general opinion of the other members.

## CRYSTAL PALACE SCHOLARSHIPS.

ON Saturday the award of scholarships in connection with the Crystal Palace Company's School of Art, Science, and Literature (Ladies) was completed. The scholarship in art was adjudged to Miss Berta Ohlenschlager, of Sydenham; the medal for painting in water-colours to Miss Kate Bennett, of Forest Hill. The judges were Mr. J. B. Burgess, A.R.A., Mr. C. B. Birch, A.R.A., and Mr. R. Beavis, R.W.S. Certificates were also awarded to students for painting in oils, drawing from the antique, and drawing from the life. The musical scholarship was gained by Miss Matilda Harris, of Norwood. The examiners were Professors J. F. Bridge, Mus. Doc., and Mr. C. J. Hargitt.

## MR. FRANK HOLL, R.A.

THE tidings of the death of Mr. Frank Holl, R.A., which took place on Tuesday morning at his house in Fitzjohn's Avenue, at the early age of forty-three, will cause widespread regret. Mr. Holl had been ailing for some weeks, but it was hoped that with care he would be able to pass through the crisis which had been brought on by over-exertion. This, however, proved unfortunately to be a vain hope, and the attack of Tuesday was rapidly fatal. The *Times* says it is undoubtedly the case that the very hard work of getting his pictures ready for the exhibitions at the end of last April developed his delicacy of the heart to a dangerous extent. He was, however, unconscious of this, though he had long known that any very great exertion would be perilous. When the pictures had been sent in he paid a hasty visit to Spain by way of taking a holiday; for, he said, "I am tired, and feel as if I had been getting into a groove; a few days with Velasquez will give me just the stimulus I want." He went to Madrid and was back again in



less than a fortnight, and the strain of this long and rapid journey proved too much for him. He had a seizure soon after his return, and Sir William Jenner forbade him to undertake more than one sitter a day. This moderate amount of work seemed not too great for his strength, but a fortnight ago, while staying with a friend, he had a second seizure, and since that time his doctors—Dr. Broadbent and Mr. William Adams—regarded his case as anxious, though they by no means despaired of curing him. But on Tuesday morning at half-past eight he was again seized with cardiac disease, and in a moment he was dead.

Frank Holl was a son of the late eminent engraver Francis Holl, A.R.A., and was born on July 4, 1845, at St. James's Terrace, Kentish Town. As a boy he went to University College School, but his inherited love for art soon asserted itself, and at fifteen he was entered as a probationer in the Royal Academy schools. There he soon made his mark, obtaining a silver medal in 1862 and the gold medal and a scholarship in the following year. In 1864 he began to exhibit, and from that time contributed regularly to the exhibitions. In 1868 he gained the Two Years' Travelling Studentship, and a little later he may be said to have decided upon the style of subject and treatment by which, for the next ten years, he was almost exclusively known. He devoted himself to subject pictures, generally of a pathetic and melancholy cast, such as are indicated by the titles *No Tidings from the Sea* (1871), *Leaving Home* (1873), *Deserted* (1874), *Want*, and *The Emigrant's Departure*. Pictures of this kind, treated with undeniable power and vigour, gained him his Associateship in 1878; but if he had not in a happy moment ventured into a different field of art he would not have taken a front rank among English painters. Nine or ten years ago, however, he determined to paint the portrait of his neighbour, the veteran engraver Samuel Cousins. The impression which that portrait made is still fresh in the recollection of many; good judges were at once arrested by the strength of handling, the grasp of character, and the Rembrandt-like power over light and shade which were so apparent in it. Strange to say, the one person who disliked it was Mr. Cousins himself, who, with a curious vanity from which old men frequently suffer, declared that the painter had added to his years, and had made him appear too old. So seriously did the octogenarian engraver regard the matter that it was long before he forgave Mr. Holl, little suspecting that the painter, to use a phrase of Mr. Gladstone's, had "immeasurably increased his chances of immortality." What the public thought of the picture was very soon apparent, for Mr. Holl was at once overwhelmed with commissions, so that from that time to the day of his death he may be said to have scarcely had a single day, except during his annual holiday, free from sitters. A list of them would include a very large number of the most eminent contemporary Englishmen, while not a few Americans took advantage of a visit to London to have their portraits painted by Mr. Holl. Indeed his very last work, and the only one which he completed since the opening of the present Academy Exhibition, was a portrait of Mr. Cornelius Vanderbilt. Among the most successful of his pictures—and they have numbered at least twenty during each of the last eight or nine years—we may mention portraits of Signor Piatti; Major Graham, the late Registrar-General; Captain Sim, a naval veteran of 90 years old; Dr. Cradock, the late principal of Brasenose; Dr. Bellamy, president of St. John's; Sir Henry Rawlinson, Sir Frederick Roberts, Vice-Chancellor Bacon, Lord Wolseley, Mr. Chamberlain, Lord Overstone, Mr. Bright, and the Duke of Cleveland—the last a particularly brilliant work which attracted very great attention in the Academy of 1886. The portraits of this year are too well known to be named; everyone will remember especially the picture of Lord Spencer, which will probably be reckoned by posterity as the painter's masterpiece, and the picture of Mr. Gladstone which was last week given to its subject as a golden wedding present. Besides these half-lengths, we may mention the two full-lengths of the Prince of Wales, painted for the Middle Temple and for the Trinity House, and that of the Duke of Cambridge in the uniform of a Field-Marshal. Of these the Middle Temple portrait of the Prince is especially successful, and among all the Royal portraits exhibited at Manchester last year it stood out conspicuous as the work of a man who was really a master of his art.

Mr. Holl, who was made an R.A. in 1884, did not live to realise two of the great objects of his ambition—to paint the portraits of some beautiful women, and to paint a great group of portraits in costume, such as the Bench of Judges. The truth is that he was always so overwhelmed with commissions from eminent and wealthy men that each of these projects kept being deferred from year to year. There can be no doubt that he would have succeeded magnificently in the second task, for no one of his English contemporaries could surpass him in the gifts of colour, composition, and character-painting. Whether he would have succeeded equally well with the face of a beautiful woman is more open to question; his almost over-masculine art might have found it difficult to adapt itself to

smooth texture and soft outline. But even this difficulty might very possibly have been triumphed over, for he had triumphed over many difficulties as great. It is interesting to note that his chief reason for taking to portraiture was disgust at the treatment which his subject pictures had received from the hands of the critics. They pronounced them sombre, monotonous, a little wanting in ideas, a little heavy in handling. The young Associate was indignant, and resolved to try a new line altogether; and this resolution of his, which has given us the long list of noble portraits which have done so much of late years to raise the English school, may surely be counted to the credit of the critics, as some compensation for the many sins which are laid to their charge. For Mr. Holl's portraits are undoubtedly among the great features of the recent history of English art. People call them mannered; but to what painter's work will not the term apply? They are sometimes charged with exaggeration, with undue emphasis; but it is more true to say that they are expressive to an extraordinary degree. There is a brilliancy of execution about them, especially about the best of them, to which few works of the English school can show a parallel. They were painted under the stress of excitement; the artist used to say that unless he put his whole force into a picture, unless he felt an emotion in painting it, he could not work at all. Sometimes he thought he was failing; and it is curious that this thought was painfully and strongly present to him when he was at work upon the greatest of all his successes, the portrait of Lord Spencer, which he called the most difficult task he ever undertook. It need not be said that every touch upon all his pictures was his own, which is more than can be said of the portraits of Rubens, of Vandyke, and of Sir Joshua.

Personally Mr. Holl was charming from the openness, simplicity, and geniality of his character. He was not a conversationalist, but he had a fund of cheerful talk for his sitters, and his many friends always found him glad to see them when he had a free hour from work, and always chatty and cordial. He was very popular among his colleagues at the Academy, and no man worked harder than he at the Academy schools. He thought well of the prospects of English art, and used to say, by way of illustrating the progress which the present generation has seen, that work which in his youth would have gained a medal would now hardly gain admission to the schools.

Mr. Holl's father died four years ago. His aged mother is living, and he leaves a widow and four daughters.

#### GLOUCESTER BATHS COMPETITION.

AT the quarterly meeting of the Gloucester Town Council the subject of the proposed baths was under consideration, a lengthy report of which appears in the *Gloucestershire Chronicle*.

The finance committee reported that on July 6 the Town Clerk laid before them the Local Government Board's sanction for the Corporation to borrow sums of 7,100*l.* and 1,400*l.* for the purpose of providing public baths, the former amount to be repaid within thirty years, and the latter amount within ten years, from the date of the borrowing thereof.

The Mayor read a letter from Councillor Platt, who said he had carefully studied the baths question since the last meeting and he believed that nothing less than the committee's recommendation would meet the requirements of the case. He would strongly urge, in the interests of the ratepayers, the Council to go to the expense of 7,500*l.*, or even beyond that, so as to have a creditable building.

The Town Clerk said Mr. Tom Cook, the architect who received the second premium for his plans, had written two letters addressed to the Mayor and Corporation. They were as follows:—

39 Victoria Buildings, Victoria Street, Manchester :  
July 9, 1888.

From the Gloucester newspapers I learn something of your difficult position in this matter, and I am prepared to help you as follows:—I am willing to take up my design, and in this form I guarantee to obtain a tender for the sum of 6,000*l.*, and to carry out the work in a substantial manner, giving you all the accommodation you are to get by the "re-cast plans," which have produced such unfortunate results. To show my bona fides in this matter, if I fail to produce the result above stated, or such as shall satisfy you, I will leave myself entirely in your hands to remunerate me or not for my services, reserving only that I am paid for any attendances upon you at Gloucester.

39 Victoria Buildings, Victoria Street, Manchester :  
July 23, 1888.

I herewith send plans showing how I propose the accommodation guaranteed by my letter of the 9th. Kindly note that I have slightly improved the arrangement of the entrances, waiting-rooms, and private baths. Your desire for a private entrance to the Turkish baths suggests to me the formation of "areas" between the front block and the swimming-baths, and through one of these the private entrance is made. This is arranged so as not to interfere with the



working of Turkish baths from Barton Street ticket-office when desired. I think a passage from Prince Street to Barton Street will be a useful and valuable means of communication between the two—will increase the value of the plot of land westerly of Prince Street, and in treating for the property now blocking the end of this street will be a good lever in your hands. The passage having gates at each end may be closed nightly. The first-class swimming bath is not in this plan so long as in my premiated design. I have taken advantage of this money saving to improve the front elevation to Barton Street. I send a drawing showing this. The front windows to the private baths would be glazed with opaque glass. The manager's desk, being in the form of a "cylinder fall writing-table," will allow of everything being closed up quickly. A flap in the space for dirty towels prevents a sight into second class swimming bath from the central lobby. I think the plan and elevation will now recommend themselves to you.

Mr. Peake moved:—"That this Council, having most carefully considered the question of the expenditure in connection with the proposed public baths, sees no present sufficient reason for exceeding the amount originally fixed on, namely, 6,000*l.*, as the cost of the buildings, with the necessary fittings and appliances, exclusive of architect's and surveyor's commission and salary of clerk of the works, and this Council hereby reappoints the members of the Baths Committee as named in minute 440, with the addition of Alderman Knowles, Councillors Murrell, Campbell, Clarke, and Norton, to consider and report upon the whole question, paying due regard to the first part of this resolution, and five of them to form a quorum." Mr. Peake said it might not be out of place if he gave a history of this much-vexed question. He remembered when he first came to Gloucester, sixteen years ago, that the desirability of baths was often discussed, and more particularly just before November 1. In 1885, before he had the honour of a seat there, the Council pledged itself to baths. He alluded to the sites difficulty which followed, and said the subject fell into more resolute and determined hands, and one of the first acts of Mr. Vassar-Smith during his mayoralty was to cut the Gordian knot, and the Charlton House site was decided on. He believed that at one time 4,000*l.* was looked upon as quite sufficient expenditure on baths, but he was certain that when the Council decided on 6,000*l.* everyone considered this a most extravagant sum. One of the most vital and positive instructions to the competing architects was to draw their plans to a scale of 6,000*l.* expenditure. Mr. Trew was awarded the first premium expressly on the ground that his plans would come within that amount. A number of most meritorious plans were rejected entirely because they could not be carried out for that sum, and he said that if the Council proposed to spend the sum recommended by the committee they would be acting most unfairly, unhandsomely, and dishonourably to these gentlemen. Let them see with what amount of weight and authority this recommendation of the committee to spend 7,500*l.* came. The committee consisted of the Mayor, Aldermen Taynton and King, Councillors Powell, Vassar-Smith, Platt, Seekings, and Bruton. They all considered this a very strong committee, and if that committee had been at all unanimous in their recommendation he was sure the Council would have felt themselves called upon to place most implicit confidence in it. But their report was most emphatically opposed by the Mayor and Alderman King. Then Mr. Powell told them that Mr. Trew's original plans would have given them everything that was required, but that the difficulty was brought about by the action of the practical men. He thought they might say that Mr. Powell was in opposition to the report. Then Alderman Taynton expressed his gratitude to Mr. Powell for having so effectually shown that the practical men were responsible, and went on to say that he was thankful he could not be considered a practical man. Then Mr. Vassar-Smith, in consequence of the enormous demands on his time, was only able to attend a limited number of meetings. Mr. Bruton stated it was the most unhappy day for him when he became a member of the committee, and that he had not had a peaceful moment since. Therefore they must feel that if he had this doubt and perplexity, Mr. Bruton could not be very robust in his support of the recommendation. Thus they were brought down to two gentlemen, Messrs. Platt and Seekings, for whom they had all possible respect, but at the same time he thought their recommendation was hardly sufficient for the Council to undertake such a big responsibility. Now Mr. Trew's original plans, which were marked 5,680*l.*, could either have been carried out for that sum or they could not have been. He was not wishing to say anything hostile or disparaging to Mr. Trew. If the plans could not be carried out, then it must seriously weaken the Council's confidence in Mr. Trew and Mr. Roger Smith. If the plans could have been carried out, then the alterations and additions which were recommended by the committee—he thought, practically, recommended by Messrs. Platt and Seekings—represented an amount of over 3,000*l.* When these two gentlemen recommended these alterations and additions they either knew they would cost such an amount as 3,000*l.* or they did not know. If they did not know it, then he could not help thinking they

were lamentably negligent or incredibly ignorant. If they knew, he thought their plain duty was to have come to the Council and have stated that as they found the plans did not give what was required they recommended certain alterations and additions, and that the work could not be carried out under 8,000*l.* or 9,000*l.*, and they should have asked the Council to allow them to spend that money. It might not be amiss to see by whom the recommendation of the committee was supported. Most prominent was Alderman Mott, who supported it in a speech of great length and eloquence, introducing several arguments which he (Mr. Peake) could not help thinking were very specious, although they sounded very attractive. Alderman Mott had told them that this question was a matter of business. Well, he presumed Alderman Mott would expect a business to pay. He did not think any gentleman believed that the baths could be by any possibility pay; therefore if Alderman Mott's argument were followed to its logical conclusion there would be no baths at all. Then Alderman Mott said the Council made a mistake altogether in deciding what amount they would spend before they decided what they really required. He (Mr. Peake) did not think the baths necessary, although he thought they were desirable, and therefore he considered the proper course, as the Council had wisely taken, was to decide first how much money they were prepared to spend for the gratification of a desire. Alderman Mott had said they should do everything they could to render the city attractive as a place of residence. There was a well-known saying that example was better than precept, and he would like to ask Alderman Mott whether, when these baths were erected in accordance with his ideas—with carpets, mirrors, and decorated walls—he would consider them sufficiently attractive to induce him to come and live in Gloucester? He could not help thinking that if Alderman Mott, who did a large business here and had many interests in the city, could not see his way to reside here, then his arguments would not have much weight with other people. At one meeting Mr. Mousell had referred to the plans marked "Experience," but somehow at the next meeting he appeared to have undergone a process of conversion with regard to them. Mr. Moffatt had supported the recommendation of the committee, and said the proposed baths were very cheap. In conclusion, he said he did not know how the Council stood with regard to Mr. Trew—whether they were absolutely wedded to him, because it might be considered necessary to have a divorce. Mr. Baker seconded the resolution.

Mr. Murrell said he was sorry he could not agree with the recommendation of the committee. He wanted to see baths constructed in a useful and economical manner. But let them construct them as they liked, they would not pay. His idea was to have had the baths constructed for 4,000*l.*, and he would not exceed 6,000*l.*

The Sheriff said he had thought it would be interesting for the Council to know what the other six cities which were counties in themselves were doing in regard to swimming-baths and he therefore wrote to the town clerks of those places, and they had supplied him with official information on the subject. At Canterbury the baths were the property of private owners and they at first paid a small dividend, but the receipts were now about equal to the expenditure; they were no attraction to the city. At Chester there was a floating-bath in the river Dee, it belonged to the Corporation, and appeared to be very successful, the receipts being 145*l.* and expenses 69*l.* At Exeter the Corporation had provided a bathing-place in the river, with dressing-boxes, and the place was undoubtedly much frequented and had been a great boon. There were no public baths at Lincoln. At Worcester there were swimming-baths in the river belonging to the Corporation, and also private ones. At York the Corporation had erected two public baths at a cost of about 9,000*l.*, but it could not be said that the baths were an attraction to the city; there was a deficiency of several hundreds per annum in their working, and this had to be paid out of the rates; the Corporation made a portion of the river available by covering it and making dressing-sheds, and these were free. The Sheriff said that, inasmuch as most people could have a bath in their own houses, he did not think public baths were necessary in Gloucester, although they might be desirable. He wished swimming-baths could be made in the river, but he was afraid the water was not good enough. To spend 9,000*l.* on public baths would, he thought, be the height of folly.

Mr. Seekings said the question of cost was one really involving dimensions. It was just because the committee thought it would be a mistake to curtail the dimensions of the baths that they made the recommendation they did. He did not think Mr. Peake's review was altogether fair. Mr. Peake had tried to show that the recommendation of the committee came before the Council with but small authority. He spoke of the recommendations as those of Messrs. Platt and Seekings—as those only of the practical men. He should like to ask Mr. Peake where he supposed Alderman King was, and whether it was possible for a miserable minority of two to bring the whole eight members round to their opinion? If the truth must be



told, he must say that no man was more persistent than Alderman King in keeping up the dimensions. He feared the effect of carrying out Mr. Peake's proposition would be to limit the dimensions of the baths. He confessed he would rather have baths at a reduced cost than go without any. Reference had been made to the plans of other competitors. He hoped the committee would be business-like, and not deal with them. If a competitor chose to write a letter, let it be read and then end there. It was unfair to the architect who had been appointed to entertain any such proposal as they had heard that morning. It was most extraordinary that the proposal which they had heard to form an area between the front block and large baths was only to be found in Mr. Trew's plans. Mr. Seekings concluded by moving as an amendment that the report of the Special Baths Committee be approved and adopted. Mr. Moffatt seconded.

Alderman King said he thought it a great pity that when one member of a committee was absent that other members should undo what had been done before. He stated that when he was absent Mr. Seekings and those present "skinned the thing" by cutting out a boiler, reducing the thickness of the walls from 14 to 9 inches, and reducing the height of the buildings. As soon as he (Alderman King) came back he objected to this, and then an informal meeting of the committee was called, but he declined to attend it. He made inquiries and found that the town clerk knew nothing of the meeting, and that he was simply summoned by a boy from the surveyor's office. The committee also took upon themselves to ask for amended tenders, though they had no power to do so. There was one thing said at the last Council which struck him as being unreliable. Mr. Seekings made an assertion that the public baths at Cheltenham were 12 feet high to the wall plate, and that assertion was supported or confirmed by another member of the committee. He was so convinced that it was wrong that he made it his duty to go to Cheltenham and measure the wall plate of the baths, and he found it was 16 feet high. He had also sent a surveyor there who had measured it. He wished to prevent the Corporation being misled with regard to the dimensions of the baths.

Mr. Sydney-Turner moved that the ratepayers be called together by the mayor to decide upon the matter. Mr. Allen seconded.

Mr. Sydney-Turner's amendment was lost and Mr. Peake's resolution agreed to.

#### EDINBURGH PUBLIC LIBRARY.

A MEETING of the General Committee of the Edinburgh Public Library was held on Monday evening, Professor Masson in the chair. The minutes of the Books Committee stated the Library contained 22,709 volumes, exclusive of volumes in the hands of the binder. A letter was read from Mrs. Hodgson, Bonaly Tower, offering a donation of books, and it was agreed to accept the donation, with thanks. The Business Committee had agreed to increase the insurance of the library books by 2,000%. The minutes were approved. It was also reported that at a meeting of the Building Committee the architect, Mr. G. Washington Browne, submitted drawings for a proposed staircase, giving an access from the reference library floor to a large apartment over the principal staircase, which would be available for the storage of books, magazines, &c. It was unanimously agreed to authorise the addition.—Mr. John Harrison said that in the plan of the building there was a portion which came forward, where the doorway was. The part thrown forward to George IV. Bridge had a bare wall upon it, and the architect's proposal placed a round tower in the corner and broke up the monotony of the bare wall, besides giving access to the top flat, which was dummy to begin with. Additional storage was provided for 4,000 volumes.—The Chairman asked whether it was correct that the building would block up a view of the Castle?—Councillor Maclaren said there would be a good view of the Castle from the building.—Councillor Colston: A library is not a place for views.—The Chairman: It is rather a place for reviews.

#### THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS.

A SPECIAL general meeting of the above Association, called for the revision of rules, was held at Connaught Mansions, Victoria Street, S.W., on Saturday, July 21. Mr. Hugh Alexander, chairman of council, presided. It was unanimously resolved to add to the title of the Association the words "of Great Britain." The enlargement of the title is due to the wide extension of the movement inaugurated by the Association in 1883, to secure, by the union of all public sanitary inspectors, the interests of public officers, and also the higher interests of

the public health. The president, Mr. Edwin Chadwick, C.B., who was unable to be present, addressed a communication to the chairman cordially approving the proposed enlargement of title. The full title of the Association will be in the future "The Association of Public Sanitary Inspectors of Great Britain." Fifteen members and Associates were elected, and Mr. E. Lewis Thomas, M.A., was unanimously elected honorary counsel to the Association. It was announced that the Association had received and accepted a kind invitation from the Mayor to hold a meeting at Brighton in August, and the president, Mr. Edwin Chadwick, C.B., Dr. B. W. Richardson, F.R.S., and Sir Douglas Galton, F.R.S., had already promised to attend if possible.



#### A College of Architecture.

SIR,—Since your publication of my letters on this subject on June 22 and July 6, events have been occurring that not only seem to justify the proposal I ventured to make, but to call urgently upon the successful and influential men in the profession, and upon others taking an interest in art, to join together in aid of their younger brethren during the first stage of their architectural career.

It is true that much is actually done by the Institute and the Association for young architects who have fought through or shirked—as the case may be—their initial difficulties, but absolutely nothing that is specially intended for the assistance of the youngest. I need not enlarge upon the great importance and the wisdom of making the best possible use of this impressionable period of his life. For this purpose an architect's office is almost totally useless, or worse than useless, especially if it be what is called a good office, with plenty of work going on. The principal has far too much to do in the interests of his clients to be able to spare time in teaching his pupils, who, to learn all that is necessary, would absorb the whole of it. A stool in the office, which may or may not confer the afflatus of the Delphic tripod, must be accepted as sufficient consideration for the hundreds of guineas premium. Thus established, our neophyte—who may be anxious to learn or utterly indifferent—is necessarily left pretty much to himself, for he soon begins to think that making tracings and copying specifications is clerk's work, not his, and under these circumstances the occasional word of encouragement or instruction is not of much permanent use.

The obvious remedy is to adopt the practice of all other professions, namely, the establishment of a college in which a youth would acquire under the most favourable circumstances that elementary scientific knowledge that would enable him to profit to the utmost from two or three years of office work and business routine, and at the same time give really valuable assistance to his master. As an old architect, I confess to having felt some shame on reading the annual reports of colleges and the public distribution of prizes that have appeared in the papers during the last few weeks. I count twenty during the last week. What emulation must be excited in the youthful mind by the conferring of these honours amidst the acclamations of relatives and friends! And yet, to our shame be it spoken, we have established nothing of this kind, for, as I have said, neither the Institute nor the Association supply the want. So little sympathy had the full-grown members of the former for the struggles of the young architect, that they actually obtained permission some years ago to give the Queen's gold medal, originally intended for the encouragement of youthful ambition, unto themselves or to foreigners. This change was probably justifiable, and I only notice it to show that the Institute requires to be entered through the portals of the college if our organisation is to be perfect. The same may be said of the Association, because its evening classes—excellent things in themselves—are of use only to advanced students, whereas something is wanted to be of service to the youngest—something that will economise their time by enabling them to pass through a curriculum suited to their age in a properly arranged house, presided over by a small but suitable staff. A small beginning is what is wanted—development will surely follow. By this means I think architecture would in time become much more popular because better understood—parents naturally taking a warm interest in the work of their sons—and we should soon hear of the gift of scholarships and prizes, and, as in all other professions, of enthusiastic annual meetings presided over by princes and nobles.

Probably ere long we should be able to paraphrase the account of the annual meeting of the Royal College of Music thus:—"The College of Architecture has received a gift of 30,000%. Prince Christian was able to announce that the Commissioners of 1851 had granted a site for the new building."



The college is only five years old, yet it already possesses investments of over 120,000*l.*, and an annual income of nearly 13,000*l.*, exclusive of the above gift. It is as yet rather too early to judge the college by results. The roll of great English architects who will regard it as their Alma Mater has yet to be formed. In the meantime it is satisfactory to see that the college is well organised. A distinguished director heads the list of professors and teachers. The fees from pupils already bring in over 6,500*l.* a year, and the Queen heads the list of annual subscribers. The college has everything that should make it prosperous, and native taste ought to supply the rest. One day perhaps the new building may become the home of an English school of architecture. A steady determination to acclimatise architecture and to give it a national character has met with success among the French, and that circumstance ought to encourage a race perhaps not less richly endowed."

Permit me to say that your correspondents do not quite grasp my idea. I want to create a state of things for the comfort and benefit of the very young architect who is yet on the threshold of his career. They are thinking of him when he has finished, or nearly finished, his articles. With a college established and the goodwill of the profession secured, the pupil, after signing his indenture, would, with the mutual sanction of the parent and the master, be lodged in company with others in its pleasant courts. Work and play would be appropriately blended to suit the youthful constitution, and as soon as—but not until—the final examination was passed, the pupil would depart to take up his office work. The time occupied would vary according to ability and education. In some cases a few weeks, in others months. The sciences more or less connected with architecture would be taught rather than art, though this latter would, of course, not be altogether neglected. The grandest effects in architecture have depended quite as much upon constructive as upon artistic knowledge, and, if this be true, it is obvious that all those sciences pertaining to the theory and practice of building construction should be taught and impressed upon the young pupil as the essential groundwork of his future success. Art is so fascinating to the youthful mind that it may almost be left to take care of itself.

To conclude. I believe there is a very general conviction that something of this kind is wanted to make our organisation perfect. The Institute numbers about 1,000 members, and there are at least 10,000 architects in the United Kingdom. Surely such a work would be a worthy one for the profession to accomplish, and as a large part of it would probably consist of reorganisation, and as a small beginning would be sufficient, its magnitude does not appear to be very formidable.

THE WRITER OF THE ARTICLE  
"A COLLEGE OF ARCHITECTURE."

#### Competitions.

SIR,—The following correspondence which has taken place between myself and the Commissioners will be instructive, as showing the way in which the Clapham Public Library competition was conducted. I therefore send it to you for publication.—I am, &c.,

JOHN J. JONES,  
Author of Designs Spes A. & Spes B.

10 Lydon Road, Clapham, S.W.

(COPY.)

July 14, 1888.

To the Chairman and Commissioners for Public Libraries and Museums for Clapham.

Gentlemen,—I beg to submit for your consideration the following facts:—

1. On April 14 last I received from your secretary a letter inviting me to prepare, by way of competition, plans for your "selection for the erection of a public library on land at the corner of Orlando Road and Clapham Common," subject to certain conditions and stipulations contained in such letter.

2. Condition 11 therein contained stated that the cost of the building was not to exceed 3,500*l.*

3. In pursuance of such letter, I inspected the site of the proposed building, and found that the site plan sent to me by your secretary was grossly incorrect in outline and measurement.

4. In order that this inaccuracy might be brought to your notice, and an amended and correct plan supplied to the competitors, I saw your secretary and submitted to him the correct plan which I had made of the site.

5. Subsequently I again saw your secretary and called his attention to what seemed to me the inadequate sum mentioned in condition 11, and asked him whether he thought it was probable you would insist upon a strict compliance therewith, or whether the sum could be at all increased. He referred me to Mr. Morgan for information on this point.

6. I called on Mr. Morgan, and he informed me that the sum mentioned in condition 11 could not be exceeded.

7. Bearing in mind the information vouchsafed to me by Mr. Morgan, I prepared my designs in accordance with your instructions, and in my reports accompanying them I stated my willingness to obtain *bona fide* tenders to execute the work for the sum before mentioned.

8. When the designs were exhibited, I attended as one of the general public, and took notes of those of my fellow-competitors. I

found that mine were the only designs drawn to the correct site, and consequently the only ones that could be executed without serious alterations.

9. At your meeting on May 30, you appointed as your professional assessors, Messrs. Neighbour & Allcroft. They reported to you on the cost of the various designs, and, with regard to design "Light," stated that it exceeded the stipulated sum in condition 11 by 400*l.*, and that my design was the only one that could be executed for the sum of 3,500*l.*

10. The only conceivable advantage I could derive for the labour and expense involved in the preparation of my designs, was the fact that I should be placed on exactly the same footing as the other competitors with a possible view of securing the work. The fact of your having accepted the design "Light," by Mr. P'Anson, which, according to the report of the assessors appointed by yourselves, does not comply with your condition as to cost, and which moreover, having been drawn to a site which does not and never did exist, cannot possibly be carried out, is, as I think every fair-minded man will admit, a gross injustice to me and a flagrant breach of the conditions laid down by yourselves.

Apart, however, from my own opinion, I would venture to ask what inducement you considered you offered to me, as a professional man, except the nominal sum of 10*l.* 10*s.*, which I need not say represents but a tithe of the work done.

It was owing to the above facts that I returned your cheque for the sum of 10*l.* 10*s.*, which is totally inadequate remuneration for my services, and it is also owing to the above facts that I consider the public should be made acquainted therewith, and I therefore reserve to myself the right to publish this letter, together with any answer which you may think fit to instruct your secretary to send me.—I am, &c.,

JOHN J. JONES.

(COPY.)

July 19, 1888.

Dear Sir,—I read your letters of the 5th, 7th, and 14th inst., to the Library Commissioners at their meeting yesterday. The Commissioners have directed me to inform you that they must respectfully decline to enter into any discussion with you as to the choice which, after very careful consideration, has been made of a design for the proposed library. Kindly say if I shall return you the cheque of 10*l.* 10*s.* I have given instructions for your designs to be returned.—I am, &c.,

HENRY BULCRAIG, Hon. Sec.

(COPY.)

July 25, 1888.

Dear Sir,—I have to thank you for returning my designs. I am very surprised the Commissioners should have thought it necessary to ask the question contained in your letter of the 19th inst., with reference to the 10*l.* 10*s.*, and I shall feel obliged if you will, at the earliest date, inform them that under the circumstances I must again emphatically decline to receive any "honourarium."—I am, &c.,

To Henry Bulcraig, Esq.

JOHN J. JONES.

#### City of London College.

SIR,—The result of the last May examinations of the Science and Art Department in Building Construction shows that at the City of London College three of the students passed in the honours stage, eleven in the advanced, and thirty-six in the elementary. Of the latter twenty-one received first-class certificates, and out of the fifty-three candidates only three failed, all in honours. These classes are under the able guidance of Mr. Henry Adams, who proposes next session to develop a new feature which promises to be very successful. This is, to give an additional course of about thirty lectures upon details of building construction, freely illustrated by diagrams, at which students may take notes without being under the necessity of making drawings as heretofore. The ordinary course will be continued as usual.—Your obedient servant,

July 26, 1888.

D. SAVAGE, Secretary.

#### LEGAL.

##### Court of Appeal.—July 30.

(Before the MASTER OF THE ROLLS, LORD JUSTICE LINDLEY, and LORD JUSTICE BOWEN.)

PRIESTLEY AND ANOTHER *v.* STONE.

ACCURACY OF QUANTITIES.

This was an action by builders against a quantity surveyor. The Rev. Reginald Tuke, when about to build a Roman Catholic church at Chiswick, had employed one Kelly, an architect. Kelly prepared the plans and instructed the defendant, a quantity surveyor, to take out the quantities according to the plans. The defendant accordingly prepared a bill of quantities, had a number of copies lithographed, and handed them to Kelly. Kelly thereupon applied for tenders for the building of the church, and the plaintiffs, among others, tendered. Another tender was accepted for a certain sum. The plaintiffs brought this action to recover damages for injury caused by the alleged negligence and breach of duty of the defendant as quantity surveyor, in preparing an inaccurate bill of quantities. The plaintiffs based their claim upon the ground that the defendant, by preparing the bill of quantities, represented that the same was correct, and would be sufficient for the building



of the church according to the plans, and that it was the duty of the defendant to use ordinary care and skill in the preparation of the bill of quantities, knowing that tenders would be made upon the faith thereof. The defendant, in his statement of defence, denied that he was negligent, and said that there was no privity of contract between him and the plaintiffs, and that he did not owe any duty to the plaintiffs. He also denied that there was any inaccuracy in the bill of quantities, and alleged that the plans were altered after the quantities had been prepared. At the trial before Mr. Justice Stephen without a jury, the judge gave judgment for the defendant. The plaintiffs appealed.

Mr. Edwyn Jones argued for the plaintiffs; Mr. Spokes, for the defendant, was not called upon.

The Court dismissed the appeal.

The Master of the Rolls said that no such action as this had been known before the present case. The contract as to taking out the quantities was made between the architect and the quantity surveyor and not with the builders. The surveyor was employed to take out the quantities for the architect, and handed them to him; and the surveyor had no control over the way in which the bill of quantities was used. The quantities might not be used at all, and they did not amount to a representation that they were true in fact. The architect could check them. If the bill of quantities were fraudulently made the case might, perhaps, be different; but the case at the trial was not put upon this ground, and there was no evidence of any fraudulent or reckless statement. The quantity surveyor was not bound to conclude that the bill of quantities would be shown to any one. The architect, in fact, might alter the quantities before sending them to the builders. This was an attempt to manufacture a new action which the Court would not sanction.

Lord Justice Lindley concurred. There was no privity of contract between the builders and the quantity surveyor. The custom relied upon as to privity between builders and quantity surveyors was not proved, and, even if proved, the custom would probably be held to be unreasonable and bad within the decision in "*Bradburn v. Foley*" (3 C. P. D. 129). It was there put upon the ground that the defendant, in effect, made a negligent representation to the plaintiff. The real truth was that the defendant was employed by the architect, and not by the builders, and there was no such representation. In his opinion there was no evidence of want of reasonable care.

Lord Justice Bowen also concurred. The action was without precedent. There were two fatal objections to the plaintiffs' claim—there was no privity between the plaintiffs and the defendant, and the defendant owed no duty under the circumstances to the plaintiffs, as duty would only arise from privity. It was said that the defendant made a misstatement which he knew would be passed on to other persons, and that he was liable on the authority of *Peek v. Derry* (37 Ch. D. 541). In applying *Peek v. Derry* it was always important to consider the meaning of the word "statement." If a man made a statement as upon his own belief, he either believed it or he did not. If he believed it, the statement was true; if he did not believe it, the statement must be fraudulent. The decision in *Peek v. Derry* could not apply to such a case as that. But it would be otherwise if a man made a statement outside his own belief. A quantity surveyor was, of course, bound to take reasonable care in taking out quantities. But he made no representation that he had taken such care. He only represented that those were his quantities—a statement as to his belief. Therefore, assuming that there was evidence of negligence in the defendant, it was not enough to render him liable to the plaintiffs. Even assuming that a fraudulent misrepresentation, or one so reckless as to be fraudulent, would render the defendant liable to the plaintiffs, that case was not put at the trial, and there was no evidence of it.

### GENERAL.

**The Annual Exhibition** of works of art submitted in the national competition, in connection with the Science and Art Department, was opened on Saturday at the South Kensington Museum.

**A Collection** of examples of the older water-colourists, and a series of the seventy-one mezzotint etchings of the "*Liber Studiorum*," have been presented to the Oldham Art Gallery by Mr. C. E. Lee.

**An Exhibition of Pictures** has been opened in the Dudley Gallery, Birmingham. It is the first time since the establishment of the gallery that a collection of notable works has been obtained.

**The Mayor of Chester** has built and presented to the city a reading-room as a Jubilee memorial.

**The Justices of the Peace** for Arbroath district on Monday refused to grant a theatrical license for a wooden theatre in Reform Street, on the ground that the premises were not suitable.

**Mr. Hutchison, R.S.A.**, has just completed in clay the bust of the Queen for the Victoria Art Gallery, Dundee, and has been further commissioned to execute a bust of the late Prince Consort.

**The Leeds Fine Art Gallery**, it is expected, will be finished and opened in October. Among the modern works will be *Napoleon on Board the Bellerophon*, by Mr. Orchardson. Sir Frederick Leighton, Mr. Cope, and Mr. E. Armitage have promised to lend examples of their work.

**A Collection** of water-colours and oil-paintings, principally of the English school, has been lent to the Nottingham Castle Art Museum, by Mrs. Moysey, of Leightonstowe, for exhibition.

**The Coventry Guardians** have decided on building an infirmary containing 150 beds, the estimated cost being 2,500*l.*

**Mr. S. W. Kershaw, F.S.A.**, read a paper on East Barnet Church, on occasion of the visit of the London and Middlesex Archaeological Society to that district last week.

**The Dublin University** has conferred the degree of Master of Engineering upon Sir Lowthian Bell and Mr. Ramsbottom.

**The Personal Estate** of the late John Waddell, of Edinburgh, contractor, amounts to 139,962*l.* 10*s.* 5*d.* The estate is to be distributed between the widow and family.

**Mr. B. W. Adkin, P.A.S.I.**, has opened offices at 33 Walbrook, E.C., in connection with his practice as a surveyor.

**The Sheffield Chamber of Commerce** has adopted a resolution in favour of the construction of a canal from Sheffield to Goole. It would be fifty miles long, and cost 1,000,000*l.* The scheme has the approval of many of the local manufacturers.

**The Civil List Pensions** for the year ending June 20 last include the following:—Sir John Steell, in consideration of his merits as a sculptor, 100*l.*; Miss Mary, Miss Rose Jane, and Miss Amy Leech, in consideration of the eminence of their brother, the late Mr. John Leech, as an artist, 10*l.* each; Mrs. Eugenia Moira, in recognition of the eminence of her late husband as a miniature painter, 25*l.*; and Mr. John Bell, in recognition of his merits as a sculptor, 50*l.*

**A Library and Reading-room** is to be built on the Kensington Fields, Liverpool.

**Mr. Allen**, of Gravelley Hill, was on Wednesday found liable, at the Birmingham Police Court, under the new by-laws relating to new streets, courts and buildings, for infringement in covering up drains before inspection, and for building a water-closet without depositing plans, in connection with seventeen dwelling-houses in course of erection.

**The Belfast Society**, in conjunction with the Dublin Naturalists' Field Club, made last week an archaeological excursion in the Drogheda neighbourhood. Slane, its abbey and hermitage; Monasterboice and Mellifont, and the prehistoric cemetery of Brughna-Boiane, an assemblage of tumuli and other sepulchral remains, said to date probably from the earliest epoch.

**A Report** by Messrs. Demaine & Brierley, architects, of York, on the church of St. Michael-le-Belfry, states that a good deal of the stonework, especially the carved and moulded parts, is in a state of very rapid decay, the estimated cost of repairs being 1,033*l.* A committee has been appointed to carry out the work.

**The Fifty-sixth Annual Report** of the Commissioners of Public Works in Ireland was issued on Monday. During the past year the commissioners made 1,321 loans for public works, amounting to 829,766*l.* Twenty-four loans were made in 1886-87, to the amount of 79,161*l.* for building 852 labourers' dwellings, whilst last year applications were received for loans amounting to 50,183*l.* for the same purpose, of which twenty, to the amount of 34,746*l.*, have been sanctioned.

**The Budget** submitted to the Victorian Legislative Assembly at Melbourne last week included several items of interest to the building trade. It is proposed to sell the valuable sites near Melbourne occupied by the Lunatic Asylum, and it is expected that 1,000,000*l.* will thus be realised. The cottage hospital system is to be introduced in the country districts. With the proceeds of the sites it is proposed to expend 400,000*l.* in the construction of new asylums on the cottage principle, 100,000*l.* for the completion of the Parliament Houses, 95,000*l.* for university requirements, 90,000*l.* for a public library and national gallery, 25,000*l.* for a military college, 20,000*l.* for a workmen's college, 25,000*l.* for an agricultural college, and 60,000*l.* for the Warrnambool breakwater. It is also proposed to sell the site of the police-court to the City Corporation of Melbourne for 140,000*l.*, and appropriate the sum to purchase a property in Melbourne on which law offices, &c., will be erected for the same amount.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. **ROBERT BOYLE & SON, Ltd.**



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, AUGUST 3, 1888.

## EDITORIAL NOTICES.

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## COMPETITION OPEN.

GORTON.—Sept. 15.—Designs are Invited for Public Baths. Mr. R. T. Holland, Clerk to the Local Board, Local Board Offices, Gorton.

## CONTRACTS OPEN.

ABINGDON.—For Rebuilding Portion of Parchment and Leather Factory. Mr. J. George T. West, Architect, Abingdon.

AUDLEY.—Aug. 6.—For Supply and Erection of Single-Lift Gasholder and other Works. Mr. T. Sherratt, Clerk to the Local Board, Audley.

AYLESBURY.—Aug. 3.—For Erection of a Post Office. Secretary, H.M. Office of Works, 12 Whitehall Place.

BADSWORTH, PONTEFRACE.—For Foundations and Garden Walls for House. Mr. C. J. Ferguson, F.S.A., Architect, 50 English Street, Carlisle.

BELFAST.—Aug. 16.—For Erection of Constabulary Barracks at Mount Pollinger. Mr. W. B. Soady, Secretary, Office of Public Works, Dublin.

BIRKDALE.—Aug. 4.—For Erection of Conservative Club. Mr. J. Dod, 16 Exchange Buildings, Liverpool.

BOLTON.—Aug. 8.—For Reconstruction of Railway Bridge, Manchester Road. The Engineer, Hunt's Bank, Manchester.

BRADFORD.—Aug. 20.—For Altering Salem Chapel for School Board Office. Mr. C. H. Hargreaves, Architect, Craven Bank Chambers, Bradford.

BRADFORD.—Aug. 6.—For Building Five Houses. Messrs. M. Brayshaw & Co., Architects, Bowling Old Lane, Bradford.

BURNLEY.—Aug. 8.—For Re-seating and Alterations at St. Anne's Church, Fence. Messrs. W. Waddington & Son, Architects, 5 Grimshawe Street, Burnley.

BURNLEY.—For Building Co-operative Stores and Four Cottages. Mr. G. B. Rawcliffe, Architect, 5 Nicholas Street, Burnley.

CARDIFF.—Aug. 13.—For Reconstruction of House on the Flat Holmes Island. Mr. W. Harpur, Borough Engineer, Cardiff.

CARDIFF.—Aug. 8.—For Building Hotel at Barry. Mr. Sydenham W. Richards, Architect, Tower Chambers, Church Street, Cardiff.

CARLISLE.—For Pulling Down Premises and Dwelling-houses, and Building Business Premises and Dwelling-house. Mr. T. T. Scott, Architect, 14 Bank Street, Carlisle.

CLEATOR MOOR.—Aug. 6.—For Building Stores, Warehouses, Manager's House, &c., at Bigrigg. Mr. T. Mullen, F.S.A., Secretary to the Co-operative Society, Cleator Moor.

CLONMEL, CO. TIPPERARY.—Aug. 9.—For Erection of a Chapel at the Lunatic Asylum. Mr. W. G. Doolin, Architect, 20 Ely Place, Dublin. Secretary, Board of Control, Custom House, Dublin.

COCKERMOUTH.—Aug. 8.—For Building Drying-house at Woollen Mill. Mr. R. S. Marsh, Surveyor, Challoner Street, Cockermouth.

CORK.—Aug. 11.—For Heating St. Colman's Cathedral, Queenstown. Mr. G. C. Ashlin, Architect, Sun Chambers, Trinity Street, Dublin.

CORK.—For Seats and Benches for Dining-hall at District Lunatic Asylum. Mr. W. H. Hill, Architect, 15 Marlborough Street, Cork.

CROYDON.—Aug. 4.—For Classroom and Cloak-room at Board Schools. Mr. R. Ridge, Architect, 12 Katharine Street, Croydon.

CWMBACH.—Aug. 7.—For Alterations to the Bryn Seion Hall. Mr. M. John, Rose Cottage, Cefnpennar Road, Cwmbach, Aberdare.

DERBY.—Aug. 11.—For Erection of Infectious Diseases Hospital. Mr. R. J. Harrison, Borough Surveyor, Derby. Mr. J. Jones, Clerk, Municipal Offices, Derby.

DUDLEY.—Aug. 3.—For Fitting Board of Guardians' Offices. Messrs. Wood & Kendrick, Architects, West Bromwich.

DURHAM.—Aug. 13.—For Building Observatory Ward at Sedgfield Asylum. The County Engineer, Shire Hall, Durham.

ELY.—Aug. 7.—For Supplying and Laying Cast-iron Water Mains. The Surveyor to the Local Board, Ely.

FERNDALE.—Aug. 7.—For Building Thirty-six Dwelling-houses. Mr. W. A. Lloyd, 20 Elm Street, Ferndale.

FOLKESTONE.—Aug. 17.—For Heating Buildings of the Pleasure Gardens. Mr. Seymour Clarke, General Manager, Folkestone.

FULWOOD.—Aug. 9.—For Building Two Houses. Messrs. Veevers & Myers, Architects, 15 Chapel Street, Preston.

GOUROCK.—Aug. 9.—For Water Supply Extension Works. Mr. W. R. Copland, C.E., 146 West Regent Street, Glasgow.

HALIFAX.—Aug. 9.—For Building Four Houses. Messrs. Cockcroft & Shoesmith, Architects, 3 Commercial Street, Halifax.

HEXHAM.—Aug. 13.—For Supplying and Laying Cast-iron Water Pipes. Mr. Hubert Laws, C.E., 18 Grainger Street West, Newcastle-on-Tyne.

HUDDERSFIELD.—Aug. 9.—For Additions to Stanley Mills, Marsh. Messrs. John Kirk & Sons, Architects, Huddersfield.

HUDDERSFIELD.—Aug. 9.—For Building Twenty-one Dwelling-houses, &c., Primrose Hill. Mr. Samuel Sheard, Architect, Primrose Hill, Huddersfield.

ILFRACOMBE.—Aug. 7.—For Construction of Impounding Reservoir and other works. Mr. E. Appleton, Architect, Torquay. Mr. F. Brede, Clerk to Local Board.

ISLE OF MAN.—Aug. 25.—For Constructing and Erecting Wrought-Iron Girder Bridge, with Two Opening Spans across Harbour at Ramsey. Mr. T. J. Lilley, Engineer, 4 Westminster Chambers, Victoria Street, Westminster.

LEEDS.—August 3.—For Erection of Wesleyan Chapel, Lincoln Fields, Newtown. Mr. G. F. Danby, Architect, 45 Great George Street, Leeds.

LITTLE DRIFFIELD.—Aug. 4.—For Restoration of Church. Mr. T. L. Moore, Architect, 6 Downshire Hill, Hampstead, N.W.

LIVERPOOL.—Aug. 4.—For Proposed Premises for Sheltering Homes. Messrs. C. O. Ellison & Son, Architects, 62 Dale Street, Liverpool.

LLANELLY.—Aug. 7.—For Erection of Board School for Boys and Girls. Mr. E. H. Lingen Barker, Architect, Hereford. Clerk to Llanelly School Board.

LONDON.—Aug. 9.—For Additions and Alterations to Work-house, Walworth. Messrs. Jarvis & Sons, Architects, 29 Trinity Square, S.E. Mr. H. C. Jones, Clerk, John Street West, S.E.

NELSON.—Aug. 8.—For Reconstruction of Railway Bridge. The Engineer, Hunt's Bank, Manchester.



PONTYPRIDD.—Aug. 6.—For Building Three Shops, Taff Street. Mr. T. Rowland, Architect, Market Buildings, Pontypridd.

PUDSEY.—Aug. 6.—For Building Residence. Mr. C. S. Nelson, Architect, Albert Chambers, Park Row, Leeds.

RIPON.—For Schoolroom, Classrooms, and Dormitories at Grammar School. Mr. G. Corson, Architect, 25 Cookridge Street, Leeds.

STARBECK.—Aug. 8.—For Building Foreman's House and Twelve Cottages. Mr. W. Bell, Architect, North-Eastern Railway, York.

WIGAN.—Aug. 15.—For Building Offices at the Gasworks. Mr. J. Timmins, Engineer, Gasworks, Wigan.

WINDHILL, BRADFORD.—Aug. 8.—For Building Minister's House, &c. Mr. J. Crawshaw, Architect, Otley Road, Shipley.

### TENDERS.

#### ALDERSHOT.

For Building Chimney-shaft at Sewage Works, Ash Road, Aldershot. Mr. W. L. COULSON, Surveyor.

Snuggs, Aldershot	£233 0 0
GEORGE KEMP, Aldershot (accepted)	152 0 0

Steam Water-tank to be advertised again.

#### BRISTOL.

For Building Board Schools, Ashton Gate, Bristol. Messrs. HANSOM & BOND, Architects. Quantities supplied.

H. A. Forse, Bristol	£3,760 0 0	Boundary Wall, Levelling Site, &c. £250 0 0
W. Church, Bristol	3,717 0 0	267 0 0
Stephens & Bastow, Bristol	3,630 0 0	232 0 0
W. H. Cowlin & Son, Bristol	3,573 0 0	234 0 0
Eastabrook & Sons, Bristol	3,549 0 0	198 0 0
G. Humphries, Bristol	3,490 0 0	243 0 0
J. Perrott, Bristol	3,393 0 0	217 0 0
T. R. Lewis, Bristol	3,379 0 0	185 0 0
J. Wilkins & Son, Bristol	3,370 0 0	230 0 0
A. J. Beaven, Bristol	3,370 0 0	205 0 0
H. Rossiter, Bristol	3,300 0 0	187 0 0
C. J. King & Son, Bitton	3,055 0 0	193 0 0
R. Warmington, Fishponds	2,334 0 0	180 0 0

#### ATHLONE.

For Resheeting Gasholder, or Construction of New One, for the Athlone Town Commissioners.

	New Gasometer.	Repairing Old One.
W. Daniel, Dublin	£215 0 0	£187 0 0
Porter & Co., Lincoln	200 0 0	162 10 0
HOLMES & Co., Huddersfield *	190 0 0	170 0 0
Wiley & Co., Exeter	189 0 0	141 0 0
J. Boulger, jun., Dublin	165 0 0	105 0 0

\* Accepted.

#### BATLEY.

For Building Branch Co-operative Stores, Nine Houses, &c., Clerk Green Road, Batley. Mr. WALTER HANSTOCK, A.R.I.B.A., Architect, Batley. Quantities by Architect.

S. S. Baines, Batley, mason	£1,150 0 0
H. Brooke, Batley, joiner	575 0 0
G. Fawcett, Dewsbury, slater	93 10 0
W. Parker, Heckmondwike, plasterer	83 0 0
J. Walshaw, Batley, plumber	73 0 0

Total . . . £1,974 10 0

For Building Five Terrace Houses, &c., Batley. Mr. WALTER HANSTOCK, A.R.I.B.A., Architect, Batley. Quantities by Architect.

C. T. Robinson, Batley, mason	£625 0 0
Horsnell & Heald, Ossett, joiner	210 0 0
Metcalf & Lockwood, Staincliffe, plasterer	55 0 0
J. M. Thornton, Heckmondwike, slater	48 10 0
J. Walshaw, Batley, plumber	34 0 0

Total . . . £972 10 0

#### BRADFORD.

For Building Warehouse, Stable, and Dwellings, at New Lane Mills, Laisterdyke. Mr. T. BARKER, Architect, 5 Bond Street, Bradford.

#### Accepted Tenders.

J. Moulson & Son, Bradford, mason	£2,335 0 0
M. Pitts, Stanningley, ironwork	1,020 0 0
J. Moulson & Son, Bradford, joiner	635 0 0
J. Wheaton, Bradford, plasterer	245 0 0
C. Nelson, Bradford, plumber	295 0 0
T. & A. Thornton, Ecclehill, slater	103 0 0
R. Hird & Son, Bradford, painter	58 10 0

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For Reservoir at Ravenscliffe Mills, Calverley, for Messrs. James Harper & Sons. Messrs. KENDALL & BAKES, Engineers, Idle.  
Joseph Robinson, Saltaire, mason, excavator, &c.

**CARDIFF.**

For Additions, St. Mary Street, Cardiff, for Messrs. Howell & Co. (exclusive of plumbing and ironwork). Mr. JOHN P. JONES, Architect, 27 Park Street, Cardiff. Quantities by Architect.

R. Price & Sons, Cardiff.	£17,000	0	0
Jones Bros., Cardiff	16,200	0	0
Shepton & Sons, Cardiff	15,790	0	0
D. D. Davies, Cardiff	15,300	0	0
W. Symonds, Cardiff	15,050	0	0
D. Davies, Cardiff	14,208	0	0
C. Burton, Cardiff	13,870	0	0

SHEPHERD & SONS, Limited, Cardiff (accepted). 13,380 0 0

**Constructional Ironwork.**

A. D. DAWNEY, London (accepted). 2,362 0 0

**CROYDON.**

For Repairs and Painting to the several Board Schools as under, for the Croydon School Board. Mr. ROBERT RIDGE, Surveyor. Quantities not supplied.

**Upper Norwood, Internally.**

Smith & Sons	£106	0	0
Bryan	89	10	0
Bowyer	79	0	0
COLEBY & Co. (accepted)	64	15	0

**South Norwood, Externally.**

Coleby & Co.	87	10	0
Bryan	70	10	0
Smith & Sons	58	0	0
BOWYER (accepted)	41	0	0

**Mitcham Road, Externally.**

Winburn	144	15	0
Pearce	133	0	0
Knight & Bennett	122	0	0
King	120	0	0
W. Dartnell	108	0	0
Pearson & Co.	88	10	0
Lawrence	74	15	0
MARRIAGE (accepted)	74	0	0

**CROYDON—continued.**

For New Junior Schools and Addition to Infants' Department, including new Boundary Walls, &c, to the Sydenham Road Schools, for the Croydon School Board. Mr. ROBERT RIDGE, Surveyor to the Board, Architect. Quantities by Architect.

Holt	£3,700	0	0
Hart	3,687	0	0
Bowyer	3,585	0	0
Ward	3,574	0	0
Bryan	3,557	0	0
Smith & Bulled	3,385	0	0
Barker	3,350	0	0
Marriage	3,288	0	0
SMITH & SONS (accepted)	3,087	0	0
Caplen & Redgrave (withdrawn)	2,810	8	7

For Additions to the Public Slaughterhouses, and additional Cattle Lairs, for the Corporation of Croydon. Mr. THOS. WALKER, M.I.C.E., Borough Engineer. Quantities by Mr. Robert Ridge, Surveyor, 12 Katharine Street, Croydon.

Smith & Bulled	£1,250	0	0
S. Page	1,185	0	0
H. W. Idle	1,183	0	0
W. Holt	1,125	0	0
King Bros. & Co.	1,111	0	0
G. E. Bryan	1,095	0	0
E. S. Pearce	1,083	0	0
Deacon & Co.	1,051	0	0
Borridge	1,050	0	0
Caplen & Redgrave	1,018	0	0
R. May	1,015	0	0
SMITH & SONS (accepted)	987	0	0
Ockenden	971	0	0

**CHESHAM.**

For Rebuilding the Cock, Chesham, Bucks, for Messrs. Salter & Co., Rickmansworth. Mr. CHAS. P. AYRES, Architect, Watford.

H. Mead, Chesham	£817	8	0
H. M. Dove, Watford	795	0	0
J. Bates, Chorley Wood	773	17	0
G. Darlington, Amersham	760	0	0
Rance Bros., Luton	735	0	0
Brown & Sons, Harefield	725	0	0
W. Boughton, Chesham	710	0	0
T. Turner, Limited, Watford	699	0	0

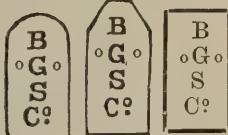
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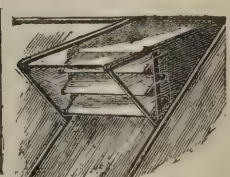
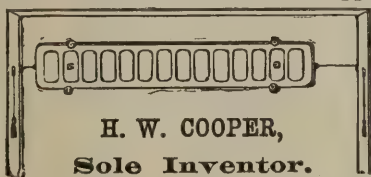
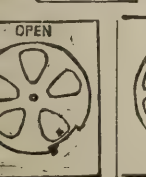
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Brown & Sons, Harefield . . . . .	£763	15	0
J. Bates, Chorley Wood . . . . .	749	10	0
H. M. Dove, Watford . . . . .	720	0	0
T. Turner, Limited, Watford . . . . .	634	0	0
G. Darlington, Amersham . . . . .	630	0	0
A. Mead, Chesham . . . . .	559	0	0
W. Boughton, Chesham . . . . .	556	0	0

## DERBY.

For Building Wesleyan Schools, Greenhill, Derby. Mr. JOHN WILLS, Architect, Derby.			
Wagg, Derby . . . . .	£815	0	0
Kelham, Derby . . . . .	780	0	0
VERNON, Derby (accepted) . . . . .	753	0	0

## EAST ARDSLEY.

For Building Wesleyan Chapel, East Ardsley. Mr. WALTER HANSTOCK, A.R.I.B.A., Architect, Batley. Quantities by Architect.			
Verity & Stainer, East Ardsley, mason . . . . .	£382	13	0
Fothergill & Schofield, Dewsbury, joiner . . . . .	306	0	0
T. C. Tattersall, Wakefield, plasterer . . . . .	49	3	2
G. Milner, Leeds, slater . . . . .	42	0	0
A. Oakes & Son, Wakefield, heating apparatus . . . . .	29	18	6
Edward Kirk, Wakefield, plumber . . . . .	21	0	0
A. Webster, Wakefield, painter . . . . .	10	7	0

Total . . . . . £841 1 8

## ECCLESHILL.

For Additions and Alterations to Greengates Board Schools, Eccleshill. Messrs. KENDALL & BAKES, Architects, Idle, Bradford. Quantities by Architects.			
S. Hobson & Sons, Idle, mason.			
H. Ingle, Greengates, joiner.			
A. Higginbotham, Idle, plumber.			
A. Taylor, Eccleshill, plasterer.			
H. A. Thornton, Eccleshill, slater.			

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For Wrought-iron Lattice Girder Foot and Bridle Bridge over the River Aire, at Buck Mill, Idle. Messrs. KENDALL & BAKES, Engineers, Idle.			
J. Bagshaw & Sons, Batley.			

## FARSLEY.

For Building Villa at Farsley, for Mr. Benjamin Holdsworth. Messrs. KENDALL & BAKES, Architects, Idle.			
James Laycock, Farsley, mason.			
J. H. Robinson, Farsley, joiner.			
E. Rhodes, Farsley, plumber.			
J. W. Pawson, Farsley, painter.			
W. Busfield, Farsley, plasterer.			
T. & A. Thornton, Eccleshill, slater.			

## GREAT HARWOOD.

For Building Congregational Church, Great Harwood. Mr. WILLIAM S. VARLEY, F.R.I.B.A., Architect, Blackburn. Quantities by Architect.			
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## Accepted Tenders.

Fecitt, Blackburn . . . . .	£1,139	0	0
Birtwistle, Great Harwood . . . . .	735	0	0
Hartley & Hartley, Great Harwood . . . . .	278	0	0
Stanworth, Burnley . . . . .	103	0	0
Shackleton, Great Harwood . . . . .	51	10	0

## KIRKBY STEPHEN.

For Building Congregational Chapel and Minister's House at Little Ashby, Kirkby Stephen. Mr. ROBERT WALKER, M.S.A., Architect, Windermere. Quantities by Architect.			
J. & T. Hamson, Kirkby Stephen, masonry and walling.			
J. & S. E. Bell, Penrith, carpenter and joiner.			
J. Jackson, Penrith, plumber, plasterer, painter, glazier.			
J. Fothergill, Kirkby Stephen, slater.			

## LONDON.

For Alterations and Improvements to Girls' School, Dulwich. Mr. T. J. BAILEY, Architect.			
H. H. Hollingsworth . . . . .	£613	0	0
J. W. Roy . . . . .	562	0	0
G. B. Ash . . . . .	510	0	0
For Erection of Five Dwelling-houses and Shop, Freemason's Road, Canning Town, for Mr. J. Kendall. Mr. FRED. A. ASHTON, Architect, Stratford.			
HEARLE & SON (accepted) . . . . .	£1,230	0	0
For Rebuilding the Cock Tavern, Billingsgate Market, Arthur Street East, E.C., for Mr. A. Smith, Leyton. Mr. FRED. A. ASHTON, Architect, Stratford.			
S. SMITH (accepted) . . . . .	£5,320	0	0

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H. L. Holloway	19,552	0	0
C. Wall	18,212	0	0
S. J. Jerrard	17,935	0	0
Stimpson & Co.	17,680	0	0
W. Johnson	17,493	0	0
J. Holloway	17,000	0	0

For Erection of Twenty-four Small Houses in Hobson's Place, Hobson's Court, and Pelham Street, Mile End New Town. Mr. JOHN HUDSON, Architect, 80 Leman Street, E.

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M. Calnan & Co.	7,391	0	0
J. Hearle & Son	7,284	0	0
F. & F. J. Wood	7,083	0	0
C. P. Roberts	7,026	0	0
J. S. Hammond & Son	6,977	0	0
J. Bentley	6,976	0	0
J. Outhwaite & Son	6,903	0	0
T. Little	6,859	0	0
T. Norton & Son	6,803	0	0
W. Catmur	6,680	0	0
H. Wells	6,620	0	0
J. & H. Cocks	6,594	0	0
J. Sparks	6,500	0	0
Harris & Wardrop	6,493	0	0
Cousell Bros.	5,720	0	0
W. GLADDING (accepted)	5,587	0	0

For Building Board School for 1,000 Children, Langford Road, Chelsea. Mr. T. J. BAILEY, Architect.

H. L. Holloway	£13,664	0	0
S. Hart	13,539	0	0
S. J. Jerrard	13,277	0	0
W. Johnson	13,074	0	0
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J. Holloway	12,656	0	0
C. Wall	12,578	0	0

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Norris & Luke	3,123	0	0
C. Dearing & Son	3,020	0	0
H. L. Holloway	3,000	0	0
Stimpson & Co.	2,970	0	0
C. Cox	2,894	0	0
W. Johnson	2,894	0	0
W. M. Dabbs	2,793	0	0

For Altering Covered Way and Enlarging Baker Street Station for the Metropolitan Railway Company. Mr. C. P. SEATON, C.E., Engineer. Quantities supplied by Mr. A. R. Brede, Surveyor, 58 Theobald's Road, W.C.

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For Building House for Dr. Grant, Padiham. Mr. G. B. RAWCLIFFE, Architect, Burnley.

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B. Naylor, Padiham, mason and bricklayer	£476	18	0
J. Clegg, Burnley, joiner	240	9	8
N. Bridge, Padiham, plumber	75	0	0
Exors. W. Foster, Padiham, plasterer	53	10	0
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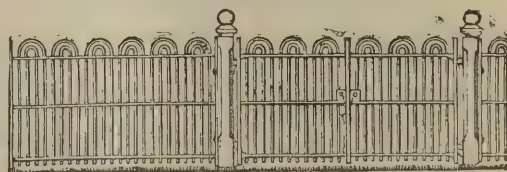
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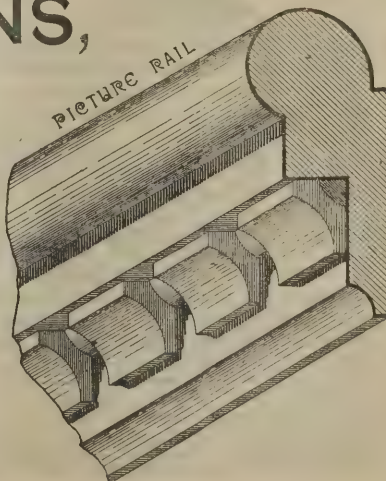


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W. Cordon, Nottingham . . .	—	4,940 0 0
Meats Bros., Nottingham . . .	4,300 0 0	4,900 0 0
R. C. Cordon, Nottingham . . .	4,286 15 0	5,560 10 0
J. Attenbowon, Nottingham . . .	3,840 0 0	5,020 0 0
S. Thumb, Nottingham . . .	3,839 0 0	4,836 0 0
T. SMART, Nottingham (accepted). . .	3,567 0 0	4,598 0 0

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For Building Engine-house and Rag Grinding Sheds, North Field Mill, Ossett. Mr. WALTER HANSTOCK, A.R.I.B.A., Architect, Batley. Quantities by Architect.

Bradley & Craven, Wakefield, engine, shafting, and boiler . . . £1,175 0 0

A. Lockwood, Ossett, mason . . . 1,000 0 0

E. Green & Son, Wakefield, patent "economiser" . . . 200 0 0

W. E. Brook, Ossett, joiner . . . 139 18 0

Watkinson, Leeds, slater . . . 80 7 0

Hepworth & Spurr, Ossett, plumber . . . 28 10 0

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For Restoration of Chancel of Owersby Church, Lincolnshire. Mr. H. M. EYTON, Architect, Ipswich.

S. Broughton, Owersby, bricklayer . . . £75 12 6

T. F. Skelton, Owersby, carpenter . . . 18 10 0

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For Building United Methodist Free Church, with Boundary Walls, &c., Rodley. Messrs. KENDALL & BAKES, Architects, Idle, Bradford. Quantities by Architects.

S. Waterhouse, Stanningley, mason. . .

J. E. Scott, Eccleshill, joiner. . .

T. Perry, Bradford, plumber. . .

E. Walker, Thackley, painter. . .

J. Laycock, Stanningley, plasterer. . .

T. & A. Thornton, Eccleshill, slater. . .

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For Erecting Covered Yard and Stabling at rear of the Woolpack Inn, Romford, Essex, for Messrs. Ind, Coope & Co., Limited. Mr. JOHN HUDSON, Architect, 80 Leman Street, E.

J. Bentley, Waltham Abbey . . .	£889 0 0
J. S. Hammond & Son, Romford . . .	867 0 0
W. GLADDING, Whitechapel (accepted) . . .	754 0 0

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For Taking Down Western Portico at the Council House, and the Erection on the Site of Police Cells. Mr. J. C. BOTHAMS, City Surveyor, Salisbury.

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T. Webb & Co., Salisbury . . .	1,311 14 0
E. Hale, Salisbury . . .	1,240 0 0
P. Tryhorn, Salisbury . . .	1,197 0 0
Young & Co., Salisbury . . .	1,195 0 0
G. HARRIS, Salisbury (accepted) . . .	1,093 0 0

## SAMPFORD COURTENAY.

For Building Railway Inn at Sampford Courtenay, Devon, for Messrs. Arnold, Perrett & Co., Limited, Brewers, &c., of Wickwar. Mr. ARNOLD THORNE, F.R.I.B.A., F.S.I., Architect and Surveyor, Barnstaple, Devon.

S. Ellis, North Tawton . . .	£612 0 0
A. Castle, Bow Mills . . .	605 0 0
H. Green, Okehampton . . .	593 0 0
W. Ash & Sons, Sampford Courtenay . . .	579 0 0
F. BANBERY, North Tawton (accepted) . . .	504 0 0

## SOUTHELD.

For Construction of Pier for the Southend Local Board.

Heenan & Froude, Newton Heath . . .	£57,254 3 7
Thames Ironworks, Blackwall . . .	56,068 4 0
Tees-side Iron Co., Middlesbrough . . .	54,582 5 9
Head, Wrightson & Co., Stockton-on-Tees . . .	52,557 9 0
G. Double, Ipswich . . .	50,716 1 3
A. & V. Halot, Louvain . . .	47,190 6 4
A. Thorne, London . . .	46,183 16 0
J. Cochrane & Sons, London . . .	45,420 0 0
ARROL BROS., Glasgow (accepted) . . .	43,484 11 2
Kirk & Randall, Woolwich . . .	41,461 0 0
Engineer's estimate . . .	49,041 0 0

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One 10-ton Steam Derrick Crane, 66 feet Jib, with extra barrel for digger.  
Seven 5, 3, 2 and 1½ ton Steam Derrick Cranes, 45, 50, 60, and 65 feet Jibs.  
Ten 5, 4, 3 and smaller Hand Derrick Cranes.  
20-ton Hand Goliath Crane, 40 feet Span.  
20-ton Hand Overhead Crane, 40 feet Span.  
No. 2, 3, 5, and 7 Pulsometers and Boilers.  
Five Concrete Mixers; 5, 6, and 7 feet Mortar Mills; Stonebreakers; Rails; and Waggon.  
1½, 2, 4, and 5-ton Portable Cranes.  
Complete Set Diver's Helmets, Breast Plate, and Pumps.  
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## WEST HAM

For Construction of a Timber-piled Wharf Wall, abutting on the River Thames; also of a Concrete Retaining Wall, to Support the Approach Road next the Manhattan Oil Wharf, Silvertown, for the West Ham Town Council. Mr. L. ANGELL, Borough Engineer, Town Hall, Stratford, E.

J. W. & J. Neave, Woodford	£4,660	0	0
Guttridge & Co., Plaistow	3,688	0	0
T. Stott, Bromley	2,750	0	0
J. Holland, Poplar	2,695	0	0
J. J. Robson, Snaresbrook	2,574	0	0
W. Howard, Canning Town	2,520	0	0
Saunders, Plaistow	2,506	16	8
Colwell & Hazell, Rotherhithe	2,497	4	9
E. F. Wren, Plaistow	2,447	0	0
O. Scotney, Canning Town	3,384	0	0
G. Bell, Tottenham	2,361	0	0
J. Jackson, Plaistow	2,345	0	0
J. THOMPSON, Chatham (accepted)	2,161	0	0

## WIRKSWORTH.

For Building House at Wirksworth, for the Trustees of the Grammar School. Messrs. JOHN PARKIN & SON, Architects, Idridgehay, Derby. Quantities by Architects.

## Accepted Tenders.

J. Walker & Sons, Wirksworth, brick, &c.	£925	0	0
J. Waterfield, Wirksworth, joiner	474	0	0
Thomas Parker, Cromford, plumber	242	4	6
J. Potter, Wirksworth, plasterer	102	16	10
Shenton & Sons, Derby, slater	74	0	0

## Total

£1,818 1 4

## Other Tenders.

Thomas Beck, Matlock, whole work	1,966	0	0
James Killer, Wirksworth, joiner	594	0	0
Alfred Shaw, Wirksworth, joiner	486	10	0
Fritchley & Sons, Wirksworth, plumber	243	0	7

## WORDSLEY.

For Building Warehouse at Messrs. Webb & Sons' Royal Seed Establishment, Wordsley. Mr. T. GRAZEBROOK, Architect, Stourbridge. Quantities by Mr. William Wykes, Birmingham.

H. Lovatt, Wolverhampton	£3,100	0	0
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## WIGAN.

For Building Chapel, Wigan. Messrs. SIMON & CAPPER, Architects, 34 St. Andrew's Square, Edinburgh.

Brown & Backhouse, Liverpool	£6,409	0	0
J. Wilson, Wigan	6,008	2	7
B. Abbott & Son, Blackburn	5,940	0	0
Hughes & Stirling, Liverpool	5,880	0	0
W. Winnard, Wigan	5,793	0	0
W. Brown & Son, Manchester	5,555	0	0

## Reduced Tenders.

W. Winnard	5,100	0	0
W. BROWN & SON (accepted)	4,980	0	0

## TRADE NOTES.

THE Prince and Princess of Wales opened, on July 17, the new buildings of the Great Northern Central Hospital, Holloway Road. The total cost of the building, the architects of which are Messrs. Young & Hall, when completed, will be about 45,000*l.* The portion now opened will cost 23,000*l.* Special attention has been paid to the sanitary and ventilation arrangements, Boyle's latest improved Patent Self-acting Air-pump Ventilators being used on certain portions of the building.

MR. E. H. SHORLAND, of Manchester and London, has recently supplied his Patent Manchester Warm-air Stoves to warm the day-rooms of Ballinasloe Lunatic Asylum, Mr. J. F. Kempster being the architect.

THE contract for erecting twenty-two lightning conductors at the Whittingham County Asylum, Preston, has been given to Mr. Joseph Blackburn, of Gresham Works, Nottingham, who is also improving the whole of the present system with his registered holdfasts. He has recently fitted the Nottingham new Law Courts throughout with electric signals and speaking-tubes.

MR. SAM DEARDS has been favoured with the order of Mr. W. G. D. Goff, of Waterford, to erect for him a new range of glass-houses, and all to be glazed on the now very well-known system of the Gold Medal "Victoria" Dry Glazing:—One conservatory, 45 feet by 25 feet; one orchid-house, 34 feet by 18 feet; one fernery, 26 feet by 16 feet; one early vinery, 36 feet by 16 feet; and one late vinery, 36 feet by 16 feet.

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THE LONDON GUARANTEE & ACCIDENT COMPANY (Limited) issue Bonds as security on behalf of Contractors or Builders for the due performance of Government, Municipal, or other Contracts of every description, at moderate rates. Office, 10 Moorgate Street, London, E.C.  
The Bonds of this Company are accepted by the several Government Departments.

## CARDIFF AND SOUTH WALES EXHIBITION.

Under the special patronage of The Most Honourable the MARQUESS OF BUTE, K.T.

An International Exhibition will be held at Cardiff in September and October, 1888, in a Building which is being specially erected for the purpose.

For particulars address PHILIP SHRAPNEL, Manager, Church Street Chambers, Cardiff.

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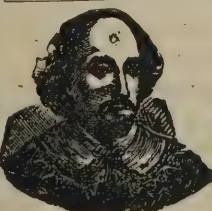
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PATENT  
HINGES AND BOLTS.

DAMP CHURCHES AND DAMP BUILDINGS  
Of every description, arising from DAMP WALLS of POROUS  
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DAMP WALLS.  
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PATENTED  
PAPER,  
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RENDERED ABSOLUTELY  
IMPERVIOUS TO WEATHER &c.

INVALUABLE AS A PRIMER,  
Especially for Plaster, Stone, and Iron, or for Distemping and  
Papering, or Preparing Artists' Boards.  
Sole Makers:—**SUTCLIFFE BROTHERS,**  
BROOKSIDE WORKS, GODLEY, MANCHESTER.



A FINE public clock is now being erected for the Town Hall, Birkdale, Southport, Lancs., being presented to the town by the proprietor of the Birkdale Estates. The clock will strike the hours, and show the time on three external illuminated dials, and is constructed from the designs of Lord Grimthorpe by Messrs. Wm. Potts & Sons, Guildford Street, Leeds, who are also making a large illuminated quarter-chime clock for the inhabitants of Paddock, near Huddersfield, to be erected in the parish church. Mr. Joseph Crosland, J.P., Royds Wood, is kindly giving the bells. Messrs. Potts are also erecting a large illuminated clock at East Cliff Congregational Church, Bournemouth, and chimes for the parish church, Leeds, and new clock for Preston Church, near Leeds.

It is gratifying to see that electric lighting is rapidly becoming more popular, and, unrestricted by laws, promises to become as cheap as any other system of lighting. We notice, for instance, that the Bath local authorities have decided to adopt electric light throughout the city; and after some delay in deciding upon the particular system, have given the whole contract to Messrs. Laing, Wharton & Down, of 82 New Bond Street, W., the proprietors of the Thomson-Houston light. If practical success were any guide to their decision, then Messrs. Laing, Wharton & Down would have many credentials, notably the lighting of the American Exhibition and the present Italian Exhibition, which have been unequalled for effectiveness. Mansions, clubs, and offices have been lighted with equal success. The showrooms of the firm at 82 New Bond Street, which we inspected the other day, are charmingly fitted up with every design of electric-light fittings, in bronze, wrought-iron, &c., and are entirely lighted by their system; so that a visit should give an excellent idea of the quality of the light and every appliance connected with it. Messrs. Laing, Wharton & Down manufacture every requisite themselves, and contract to do work under their own supervision in any part of the country.

#### BUILDING IN LOS ANGELES.

THE last report from Mr. Vice-Consul Mortimer has the following remarks on building in the Los Angeles district of California:—

The price of real estate has advanced steadily for the past four years, and in this city has reached such a figure that the prospect of a further rise can only be predicated on the

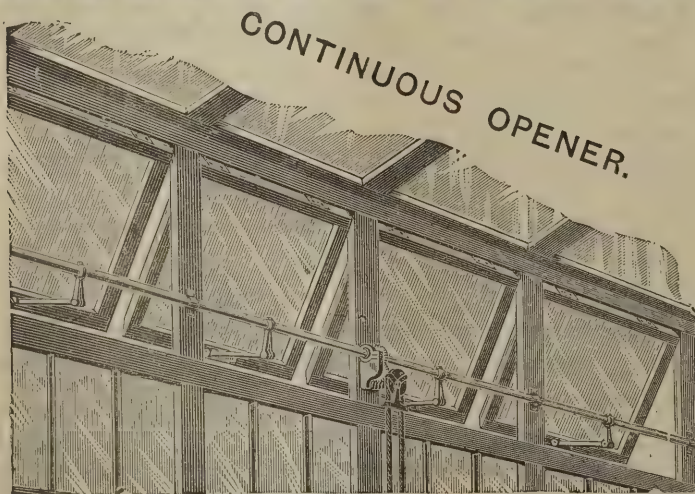
assumption that within four years the population will have reached 250,000, which I think by no means improbable. The extraordinary demand for landed property is best illustrated by the fact that in this city alone there are nearly 2,000 persons paying license as land-agents. 8,000*l.* was recently paid for a lot 20 by 100 feet, or at the rate of 400*l.* a front foot; 600*l.* per front foot was offered and refused for another lot in the centre of the city. At this rate an acre divided into lots 100 feet deep would be worth over 260,000*l.*, or a good deal more than twice as much as by cablegram I see was recently paid for land in Cecil and Salisbury Streets, London.

Upwards of 100 towns and settlements have been laid out within the past year in this district, and I am informed that there are 40 new cities on the line of the Atlantic and Pacific railroad between Los Angeles and San Bernardino, a distance of 60 miles. At the first sales of lots in many of these new cities in May and June last many persons remained standing in line in front of the places of sale for more than 24 hours for the privilege of buying a lot. As a specimen of the mode of advertising lots in these embryo cities the following, taken from the Los Angeles daily papers, will strike English readers as peculiar:—"In God's all-seeing eye there is no place like—" "A lot in — is better than being in Abraham's bosom," &c. It has been stated half seriously that one can walk on "city" lots from Ontario to Los Angeles, a distance of 40 miles. Several of these new-born cities are being built up very rapidly, and are increasing marvellously in population; many of them, however, are destined to revert to farming lands. The frantic speculation in lots in almost all the new cities has entirely ceased, and the "boom" has to some extent abated throughout the whole district. In this city the permanent improvements now being completed, and for which contracts have been made, preclude the possibility of any material decline in prices. The estimated value of the buildings now being constructed exceeds 500,000*l.* United States Government and municipal buildings to the value of 200,000*l.* will be erected this year. A company has commenced work on the construction of cable railways through the streets of the city, which, when completed, will cost not less than 300,000*l.* The fact that Los Angeles is connected with the Eastern states by two competing trans-continental lines of railway, and that a third, the Los Angeles and Salt Lake City Railway, is projected, and will probably be carried to completion in the near future, is the best indication of the estimation in which this district is held throughout the country.

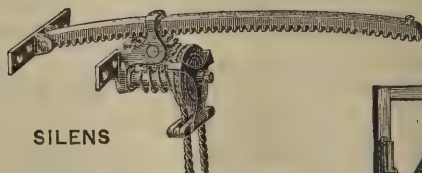
## CONTRACTORS TO H.M. GOVERNMENT.

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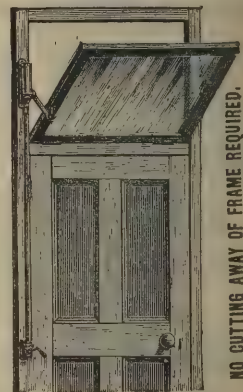
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THE SILENS, for Fanlights, Skylights, &c. Is admitted to be the best ever put before the Public. Can be adapted to any kind of window. Size and height of window no object.

From 4/3 each.

The WILMOS is worked with a rod or endless cord. It is extremely neat, and can be fixed to open either top or bottom, inwards or outwards; no cutting away of frame required. When worked with a rod is most efficient for Public Buildings, as the key can be loose. For Price Lists, Illustrations, and Testimonials, write as below.

For Continuous and other Lights, Estimates given.



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NO CUTTING AWAY OF FRAME REQUIRED.

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SIRS,—I have pleasure in testifying that I have used Leggott's Silens Adjustments for various buildings to high skylights, fanlights, and top parts of windows, and in every case they gave satisfaction.

They are secure in whatever position, whether the window is open or closed, and are quite simple and workable in their action. I prefer them to any other that I have seen or used for the above-mentioned purposes.

Messrs. W. & R. LEGGOTT, Bradford.

I remain, yours obediently,

R. DAVIES, Architect.

Considerably Reduced Price List, November 1, 1887.

ALL WORK ENTRUSTED TO US GUARANTEED SATISFACTORY.

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**109 HOPE STREET, GLASGOW; SILENS WORKS, BRADFORD.**  
TELEGRAPHIC ADDRESS—"SILENS BRADFORD."



I am informed that persons in Canada and England have invested in real estate here tempted by glowing advertisements. The risk of speculating in real estate to persons living at a distance, and whose information as to values, &c., is obtained merely through some advertising medium, is enormous. The mere fact that a real estate firm is highly commended in a daily paper proves nothing. A short time ago a firm described as "gentlemen," "honest," "trustworthy," "enterprising," and "energetic" was a few days later fully exposed as an organised set of swindlers, and this is by no means an isolated instance.

The system in use here for transferring and mortgaging land is a poor one. Private enterprise has, however, supplemented the deficiencies of the official records. A company has taken copies of such records, and is now keeping them in accordance with the system in use in the province of Ontario, Canada. This company now issue title insurance policies guaranteeing the owners of the lands insured against loss on account of defects in title.

#### NATIONAL MASTER BUILDERS.

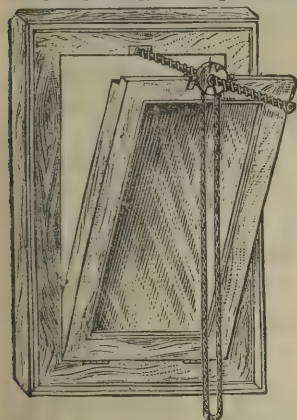
ON the invitation of the Liverpool Association of Master Builders, a company of one hundred members of the National Master Builders' Association of Great Britain paid a visit on Thursday in last week to the Manchester Ship Canal Works at Eastham.

The party had placed at their disposal the Eastham ferry steamer *Fairy Queen*, on board of which, having embarked at the Prince's Landing-stage, they had a cruise on the river and saw the North Liverpool Docks, New Brighton, Birkenhead and the South Liverpool Docks and Garston. From the latter point they crossed the estuary to Ellesmere Port, and then returned to Eastham. Here they landed and took luncheon at the Eastham Ferry Hotel. The chair was occupied by Mr. C. W. Green, president of the Liverpool Association, and the company included Mr. R. Neill, jun., of Manchester (president of the National Association), Mr. George Burt (president of the Institute of Builders of Great Britain), Messrs. S. G. Bird and R. S. Henshaw (London). After the customary loyal toasts, that of the National Association was given by the chairman, and responded to by Mr. R. Neill. "Success to the Manchester Ship Canal" was also drunk, on the proposition of the chairman. Mr. Fitzgibbon, who represented the pro-

motors and engineers, responded. The chairman also gave the health and success of the contractors, whose attention and courtesy, he remarked, had given the Association such facilities for viewing the operations. The toast was heartily drunk, and Mr. F. Donaldson, engineer to the contractors, replied. The next toast was that of the Liverpool Association, which amidst great applause was submitted by Mr. Dennett, of Nottingham, one of the vice-presidents of the National Association, and acknowledged by the chairman. Responding to the health of the "Architects, Surveyors and Engineers," Mr. G. E. Grayson said both Liverpool and Manchester had taken great interest in the Ship Canal scheme, and personally he had always felt that it would at all events do her no harm and Manchester much good.

The company then sallied forth into the wildernesses of clay embankments and wooden houses which at the present stage form the aspect of the canal, and which look, especially as regards the dwellings, as if Eastham were a mushroom town in the wild west. To accommodate the 1,600 men employed on the Eastham section of the canal naturally requires a good-sized, though scattered, village of such wooden erections, which, however, are substantial enough in their way. Four hundred yards from Eastham ferry the entrance of the canal commences, but between the two points there is now in course of construction an embankment that will be faced with rubble-stone and backed with the marl taken out of the immense cutting for the canal. Hundreds of thousands of tons of earth have been removed to make the embankment during the six months which have elapsed since operations began, and more has been taken out to make the embankment separating the canal from the estuary. However, with the nine steam navvies now at work, and a large use of locomotive power, the progress at this point has been more rapid even than the contractors anticipated, for as the promoters have to pay interest out of capital the work is pushed forward both by day and night. The visitors were shown over the works by Mr. F. Donaldson, engineer for the Eastham section to the contractor, Mr. T. A. Walker, of Manchester. The party, by means of the temporary railway laid along the bed of the canal, had the advantage of a run until close to Ellesmere Port. The means of conveyance were goods trucks fitted with planks for seats, but the Association were all well used to building operations, and roughing it. In this way the visitors saw the whole of the works. Of the four and a half miles which form the length of the Eastham section, about three run through the land on the southern shore

Preston's Patent Screw  
Adjustment,  
For opening, closing, & fastening Windows.



A 553.

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THE REGISTERED DESIGNS AND PATENTED ARTICLES ARE NUMEROUS AND VALUABLE.

All Goods for Export are CAREFULLY PACKED IN CARTON BOXES, and distinctly labelled with Orange-coloured Labels, bearing the Trade Mark as at side.

The attention of Architects and Builders is specially drawn to the merits of PRESTON'S PATENT SCREW ADJUSTMENT for Opening, Closing, and Fastening Windows of Churches, Board Schools, Warehouses, and Manufactories, as its extreme simplicity cannot fail to commend it.

An endless Cord passing over a grooved Pulley, and worked by hand, causes the Box to travel on Screw, carrying the Sash with it to the required distance, and remaining securely locked at any angle. The action is perfectly easy and a child can adjust it.

DRAWINGS MAY BE HAD ON APPLICATION.

LONDON SHOW-ROOMS:—40 HOLBORN VIADUCT.

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**SMOKE-CONSUMING AND REGENERATING FIRE LUMP BRIDGES,**

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At the above Exhibitions, Fourteen of W. NOBLE'S PATENT BRIDGES were used for the economising of fuel and the consuming of smoke, to the entire satisfaction of the Chief Engineer (A. CAREY, Esq.), and Surveyor to the Royal Commissioners (WILSON BENNISON Esq.).



of the estuary. This length has been much more than half excavated through. For a considerable depth the land consists of marl and sand, but lower down there is a bed of red sandstone rock, which has to be blasted out. At the same time a vast amount of the stone thus quarried is valuable for constructive purposes, and it is estimated will greatly reduce the total cost. It is carefully dressed into oblong blocks. From the top of the banks to the bottom the depth, in perpendicular, is 60 feet, and as the width from bank to bank is 300 feet, there is now about the works generally a good deal of impressive perspective. The entrance will be furnished with three parallel locks, each 900 feet long, and capable of passing the largest vessels now afloat, and the depth of water to Manchester will be 26 feet. Much interest was taken in the steam navvies, which are, roughly speaking, steam cranes, with the digging arrangement applied to them, and capable of being used either as navvies or as cranes. Each, it is said, will remove 600 cubic yards, or about 1,000 tons, of earth a day, and their incessant working, together with the constant passing to and fro of trains of trucks and waggons, make the whole scene one of extraordinary animation.

Returning to Liverpool on board the *Fairy Queen* after the visit, Mr. R. Neill, jun., expressed on behalf of the National Association the thanks of the company to the members of the Master Builders' Association of Liverpool for having entertained them during their visit. Messrs. Cowlin and Dennett, vice-presidents, Mr. G. Burt, Moulson, and others, also expressed their acknowledgments to the Liverpool Association, who were accorded a vote of thanks. A further vote of thanks was passed to Mr. W. Knox, the local secretary, for having successfully carried out the arrangements for the visit.

#### SOFTENING AND PURIFYING WATER.

ON Saturday, July 21, by permission of Messrs. Ellington & Woodall, the Society of Civil and Mechanical Engineers visited the pumping station of the London Hydraulic Power Company, now in course of erection in Millbank Street, Westminster; and also the pumping station at Falcon Wharf, Blackfriars, which has been at work for some five years. At the former station much interest was shown in the Porter-Clarke process of softening and purifying the water to be used, and also in the immense cast-iron storage tanks and filters which

form the roof of the building. The energy is stored in accumulators, loaded to a pressure of 740 lbs. on the square inch, the water being pumped up into them by Ellington's patent compound-surface condensing direct-acting pumping engine. Much praise was bestowed upon the handsome buildings which the company are erecting in Westminster.

#### INSTRUCTION IN DRAWING.

FOR some weeks past arrangements, the *Birmingham Post* says, have been in progress between the School Board and the Museum and School of Art Committee of the Town Council for the supervision by the latter body of the teaching of drawing in all the boys' departments of the Board schools within the borough, and for the actual instruction in art subjects, at the Central Municipal School of Art in Margaret Street, by officers of that school, of the male pupil and candidate pupil-teachers under the Board. The arrangements are now complete; and, as the new scheme is likely to lead to an important development of the art work of the town, some particulars may be of interest.

In consideration of the annual payment by the School Board of the sum of 300*l.*, the Museum and School of Art Committee have undertaken the satisfactory performance, by officials of the school, of the following duties:—I. With regard to the drawing taught in the boys' departments of the Board schools: (1) the frequent and regular inspection of the drawing taught in each of the boys' schools; (2) the arrangement with the head master of each Board school of the course of instruction in drawing and the proper classification of scholars for that subject; (3) the giving of model lessons so often and of such a character as to instruct the class-master in his methods of teaching; (4) the examination of the drawing done and the transmission to the head master of the Board school of written criticisms and suggestions thereon; and (5) the supply to the School Management Committee of the Board, at regular intervals, of reports on (a) the drawing in each boys' school, and (b) the results of each of the drawing examinations conducted by the Department of Science and Art.

II. As to the instruction in art subjects of the male pupil and candidate pupil teachers under the Board:—(1) The giving of that instruction, by competent masters, at the Central School, Margaret Street, on Thursdays, from 7.15 to 9.15 P.M.,

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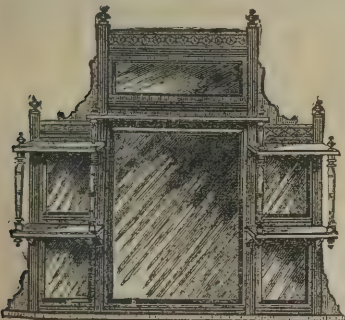
throughout the session, which lasts from the second Monday in September till the last Friday in June; (2) the provision of suitable examples, fittings, &c.; and (3) the transmission to the Board at regular intervals of reports on the attendance and work of the students in question. The head master of the Municipal School of Art (Mr. Edward R. Taylor) has undertaken to give, at the beginning of the coming session, to all the masters of the Board schools, an address, illustrated by diagrams, on the methods of teaching drawing. Steps have already been taken to carry into effect the above-mentioned arrangements. With regard to the work in the day schools, the town has been divided into three districts, according to the position of the Board schools. The number of schools in these districts are respectively 13, 13, and 14, and an inspecting teacher of drawing has been appointed for each district. The duties of an inspecting teacher will be to visit the schools in his particular district, in order to carry out the arrangements named with regard to the day schools. One hour and a half per week is, as a rule, devoted in each boys' department to the teaching of drawing, in accordance with the syllabus published in the Science and Art Directory. Having regard to an undertaking made by the School Board as to the arrangement of the time-tables, it is considered that an inspecting teacher can adequately perform his duties if he devotes six half-days per week to visiting the schools in his district, and is required to inspect each of those schools at least twice a month, the visits, as a rule, to any one school to occupy the whole of one half-day each. Most of the advice in regard to the teaching of drawing will, no doubt, be given verbally by the inspecting teacher. All the inspecting teacher's written reports—such as those required by paragraph 4 of the arrangement with the Board—must be done in copying ink, and handed by the inspecting teacher to the secretary of the Municipal School of Art; and the latter, having obtained a copy of each report, will forward it to the master of the Board school. The copies of these reports will be required for reference, *e.g.* for use when the secretary despatches to the Board the general reports mentioned in paragraph 5 of the arrangement. All communications of importance, other than the inspecting teacher's reports, will be sent to the master of a Board school through the hands of the clerk of the School Board; and the School Board will make, in writing, no official communications whatever with the inspecting teachers, save through the secretary of the School of Art. It will be observed that, although instruction in drawing is usually given at any school for only

one hour and a half, the inspecting teacher's visit will, as a rule, occupy a whole half-day, or two hours and a half. The remaining hour will be devoted to the examination of the drawing done, to consultations with the teachers in regard to their work, and to writing the required report. Two teachers have been appointed to instruct at the Central School, on Thursday evenings, the male pupil and candidate pupil teachers. The opinion was strongly expressed that two of the three inspecting teachers should give this instruction, and this arrangement has accordingly been adopted. The inspecting teachers will thus be brought into closer connection with the teaching staff of the Board schools, and be enabled to emphasise by their own methods of teaching the views expressed on their visits to the schools.

By this arrangement nearly all of the remaining rate-aided art instruction of the town has been placed in the hands of the authority especially appointed to direct work of this nature. The result will doubtless be beneficial in many ways. Not the least useful outcome of the scheme will probably be found in the fact that, after leaving a day-school, and on joining classes connected with the Municipal School of Art, a boy will have already mastered many of the preliminary difficulties, and will also be able to continue his art studies in the evenings on the same system as will now be pursued in the day schools.

#### GLASGOW CENTRAL RAILWAY.

THE Glasgow Central Railway Bill passed the Select Committee of the House of Commons on Tuesday. Its object is to connect by railway the east and west ends of Glasgow, at a cost of a million and a quarter. It proposes a line of railway beginning by a junction with the Dalmarock branch of the Caledonian system, going to the east of Glasgow, proceeding underground along two of the main streets of the city—Argyle Street and Trongate—and then proceeding on to Maryhill, the village of that name. The scheme will be carried through by independent promoters, but the parties actually interested in it are the Caledonian Company, to whom the extension will be a great advantage. It will connect them directly with three-fourths of the coalpits of Lanarkshire and the Stobcross Dock, the largest dock in Scotland. The Caledonian is at present connected with these pits, but not directly, and the new line will save eight and a half miles. It



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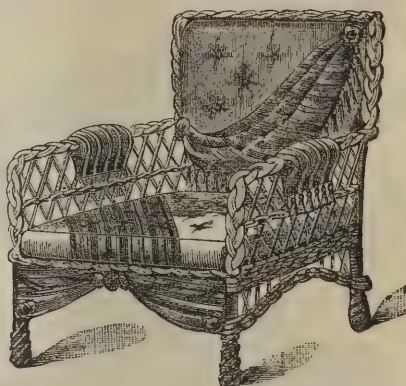
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will further give direct access to the Caledonian system, and now that the Caledonian have, by this Bill, got to Maryhill, it seems probable that the company will invade Dumbartonshire, and compete with the North British for the Helensburgh traffic and the tourist traffic to Balloch for Loch Lomond.

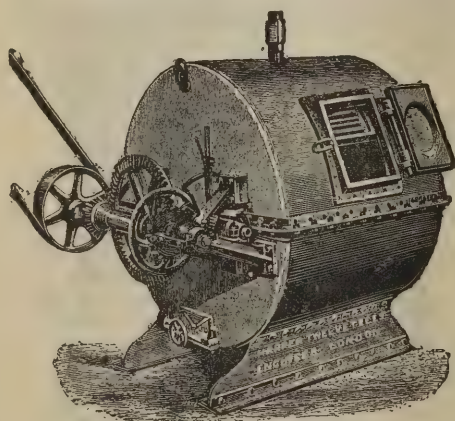
### DRIPS AND WEATHERINGS.

IN seasons such as we have experienced of late, when rain forms the most prominent feature of the elemental conditions, a little consideration of the subject of drips and weatherings is not out of place. Notwithstanding the advance made in building construction, sanitation, and the like, little attention appears to have been given to this important matter till within the last four years. Drips for many years past have been formed by lead coverings, grooves in bricks, and throatings to stone cills and copings. In most of these the projection is insufficient, the rain-water finding its way to the brickwork, causing dampness and destruction. Little need be said about lead coverings, the cost being the great objection to their frequent use. Weatherings for chimney stacks, parapets, and walls generally, are of two kinds—the oversailing brick, with its sloping filled, and the tile creasing, similarly treated. As to treating the two modes as equal to each other, Mr. Ewan Christian's remarks at the Inventions Exhibition may be quoted. He said the old mode never did weather the walls, there being no drip. It has been agreed that when the rain-water left the lower edge of the oversailing brick or tile creasing, it was never ascertained what became of it, whether it ran down the walls or fell upon the roof, but it was more likely to be the former. Happily, four years since, drip-tiles were introduced by Mr. J. Robson, of Fitzroy Street, Fitzroy Square, and, in spite of the prejudice against new things, these tiles have found their way to all parts of the country, and many of the largest buildings in London. They have been specially made for window-cills for St. Paul's new church, Kensington; most of the Fire Brigade stations' walls are weathered, and they have given the Metropolitan Board every satisfaction. They will be found in the Royal Music Hall, St. Mark's Institute, the Clock House, and many important structures. These tiles are of two kinds:—No. 1, specially made for cornices, set-offs, &c.; No. 2 is adapted to chimney-stacks, walls, &c., and may be used for a host of purposes, and their

use has been extended to the protection of fruit trees growing against garden walls; but for general purposes it has been admitted to be the most effective and slightly drip in the market, and being 60 per cent. cheaper than tile creasing, only requires one trial to secure the lasting patronage of the architect.

### BRICKMAKING IN BEDFORDSHIRE.

AN excursion has just been made from London by the Geologists' Association to Bedford, where the party was met at the railway station by several members of the Bedford Archaeological and Natural History Societies, led by Mr. Cameron, who acted as conductor during the day. The party first walked to the waterworks pumping station, and inspected the heading in the limestone rock whence the town water supply is derived. Mr. Franklin's brickyard and limestone pits and works in the fields adjoining were then visited, Mr. Cameron explaining the formation and nature of the rock sand clays, and he also read a paper on the "Brickmaking Industry at Bedford." The brick earth here, he said, is the Oxford clay, prepared alone or with an admixture of the "mild clay" of the builders—the Kelloway loam and sand which is usually obtainable in the same brickfield. Boulder clay is not used. In this particular field in which we are assembled the lower Oxford beneath the Kelloway is the clay dug; this being mixed in the pugmill with the blue Kelloway loam produces an efficient brick earth. The brickmaking season commences in April, and is carried on with great activity throughout the summer. Still winter is a busy time, for it is then that the clay is dug, and stacked, and piled in heaps, and left to weather in the frost which breaks up and crumbles the jumps. In spring the heaps are turned over and sufficient water added to give plasticity to the mass, care being taken in stirring the clay to pick out the fossils or stones, as these if allowed to remain crack the clay in drying and burn into white lumps, making the bricks unsound; for as these lumps weather out they leave the bricks riddled with unsightly holes; and if a piece of limestone no bigger than a pea be allowed to remain it will destroy any brick into which it may find its way. Hundreds of *Gryphaea* lie amongst the clay in some brickyards, and where there are so many not a few escape observation, so that unwittingly the shell of the departed lamellibranch becomes cremated at the last. Scarcely a shell of any kind can be



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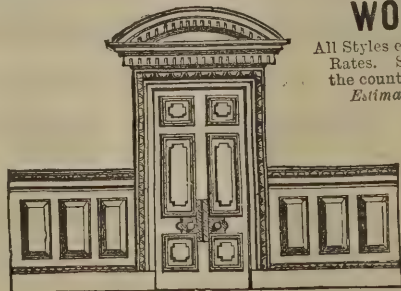
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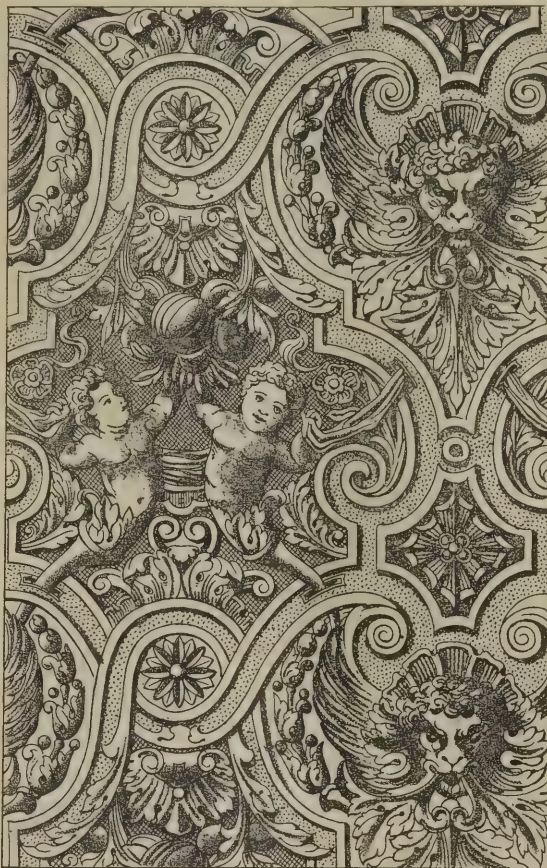
found at other brickpits, such an unfossiliferous bed being, of course, all the better for brickmaking purposes. Again, there are pits where belemnites can be gathered by the bushel. In April the clay is ripe or mellow, and in readiness for the moulder. With a well-appointed yard a man can make from 1,000 to 1,200 a day of twelve or fourteen hours, and he generally works that length of time. When steam power is used 50,000 is the output for the day. Here, with ten moulders, 10,000 to 12,000 bricks are made in a day. A raw brick has to be dried with great care. Kilns for burning are erected in many ways, and scarcely any two are exactly alike. In Bedfordshire the kiln most often seen is a rectangular one, known as the furnace kiln, having the furnaces running underneath the whole length of the structure. The main mass of Oxford clay being buried here almost to the water's edge beneath boulder clay, is not conveniently available for brickmaking purposes, what is used being the Lower Oxford, a clay bed subordinate to the Kelloway. The Cornbrash clay—the purple clay beneath that stone—is not used, or only to the small extent of having the upper 2 feet sometimes mixed in the pugmill with the other beds of clay and loam. Brick colouring is an interesting feature in the art of brickmaking, besides being an important item in its commercial value. The colour depends upon the amount of iron present in the clay, modified in some cases by the firing in the kiln. There are only grey clays in Bedfordshire, which weather yellow in their upper part, and from these are produced the red building bricks, mixed bricks, and the pale buff or cream, generally called white bricks.

#### PRESTON DOCK WORKS.

THE Corporation of Preston have made an arrangement with Mr. Walker, the contractor of the Preston Dock Works, for the suspension of operations for twelve months, in accordance with the recommendation of the Select Committee of the House of Commons. The agreement for the suspension specified that the men should cease work on the 28th ult.; that there shall be paid about 34,500*l.* to Mr. Walker as retention money; that there shall also be paid 5,000*l.* for the maintenance of the works by pumping and by protecting the stonework from the effects of frost. Mr. Walker will not be responsible for the silting up of the new diversion. It is said most of the men from the dock works will be taken to the Manchester Ship Canal.

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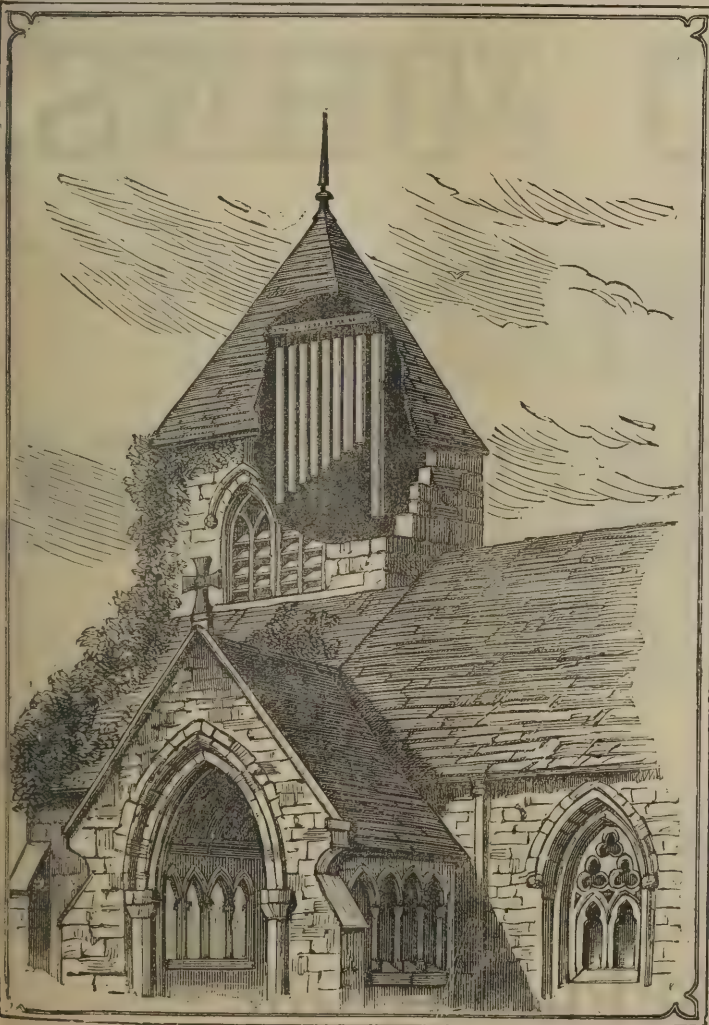
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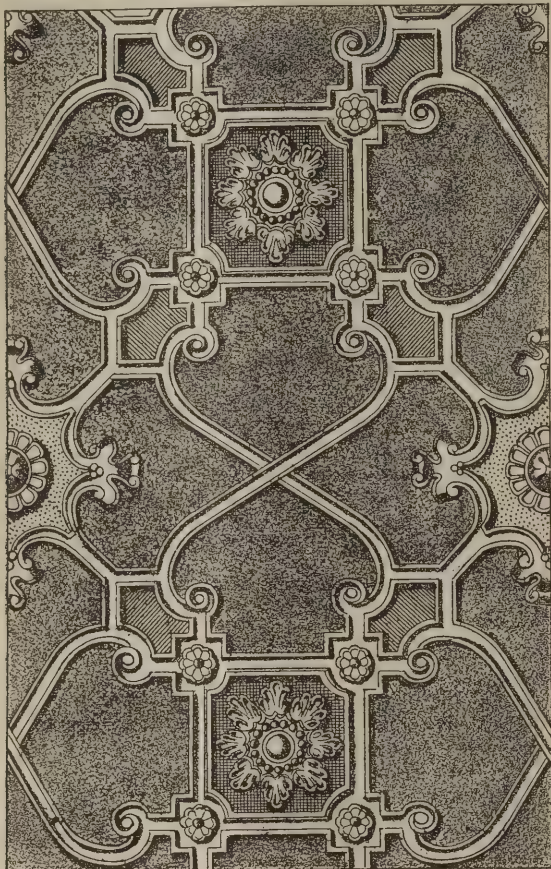
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pensive products of the Anaglypta Company cannot be too highly recommended, and in addition to possessing all the qualities that can be needed from a sanitary point of view, as also durability and suitability for all purposes, the artistic treatment, over which it can easily be seen no pains has been spared, has been one great factor in causing it to find favour



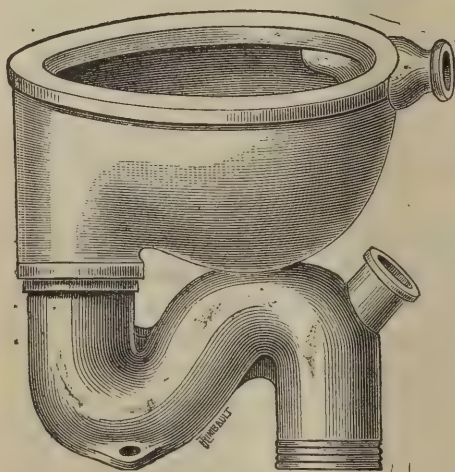
with the public in many directions. Briefly, the wall and ceiling coverings are practically indestructible, and they are produced in a large number of varied designs, most of which are of the highest artistic merit, many of them being designed by the best living artists. They also form the cheapest substantial relief decoration that can be found anywhere.

#### BUILDERS' BENEVOLENT INSTITUTION.

THE 41st annual meeting of this institution took place on July 26 at Willis's Rooms, St. James's, Mr. H. H. Bartlett, the president, in the chair. Major Britton, the secretary, read the annual report, which stated that the income had not been sufficient to maintain the charity, and that recourse had to be made to the remainder of the reserve fund to meet the liabilities for the support of the pensioners. That fund was now entirely exhausted, and an urgent appeal was made for sufficient funds to carry on the institution for the forthcoming year. Should that appeal not be liberally responded to, some of the funded property would have to be realised, a misfortune which well-wishers of the institution would much regret. During the past year the committee had only been able to recommend the election of two men, although there were several candidates, and three widows of pensioners had been placed on the pension list. The number of deaths of pensioners had been eight, the total number now on the funds being twenty-eight men and thirty-five women. The committee offered their grateful thanks to the president, Mr. H. H. Bartlett, for the kind interest he had shown for the prosperity of the institution, and with great satisfaction announced that Mr. J. Howard Colls would be the president for the ensuing year. The annual dinner would be held, with the consent of the Court of the Worshipful Company of Carpenters, at their Hall, on November 29 next. The report and accounts were adopted on the motion of Mr. George Plucknett, J.P., seconded by Mr. T. Stirling. Votes of thanks were passed to the president for the past year, Mr. H. H. Bartlett; to the vice-presidents, to the trustees, and to Mr. Plucknett, the treasurer, who was re-elected. Votes of thanks were also passed to the committee, the retiring members being re-elected, with the addition of Messrs. W. Brass and G. Wall; and to Messrs. Ward, Duffield, and Bolding, the auditors. The chairman proposed, as president for the ensuing year, Mr. J. Howard Colls, who, he believed, would do his utmost to further the interests of the institution. The resolution was unanimously agreed to, and, with a vote of thanks to the chairman, the meeting separated.

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## LIABILITY FOR SUBSIDENCE OF LAND.

THE case of *Homer v. Hanley and Buckland Colliery Company* came before Mr. Justice Denman and a special jury at the Staffordshire Assizes on Saturday. Mr. Jelf, Q.C., and Mr. Rose appeared for the plaintiff; and Mr. H. D. Greene, Q.C., and Mr. A. Young for the defendants. The plaintiff, Mr. C. J. Homer, is a mining engineer, and a director of the Hanley Colliery Company. In 1873 he purchased the Ivy House estate at Hanley for 47,000*l.* as a building estate; but he alleges that in consequence of the subsidence caused by the defendant company's mining operations, the value of the land had been seriously diminished for this purpose. One of the defendant company's collieries—the Holly Lane—came up to the edge of plaintiff's estate, and another—the Cock's Head—to within 50 yards of it. The evidence for the plaintiff was that within the last two or three years the plaintiff's land had subsided to the extent of three or four feet, and the subsidences were all in the direction of the defendant company's workings. Various professional witnesses attributed the damage to these workings, and put the damage at about 1,300*l.* Plaintiff stated that the Hanley Colliery Company, to which he belonged, and to whom he had leased the mining rights under his land, had not worked the mines to a sufficient extent to cause subsidence, and had left off working in order that there might be a sufficient support left. He considered that the subsidence was due to the neglect of the defendant company to leave proper ribs and barriers, and he estimated the damage at the least at 2,000*l.* The case for the plaintiff closed on Saturday. —For the defence, a number of mining engineers and land surveyors were called to state that the subsidence was due at least as much to the workings of the Hanley Company as to those of the defendants.—Mr. Strickland, vice-president of the Society of Mining Engineers, and formerly colliery manager to Earl Granville, was one of those who gave evidence to this effect, and he stated also that the damage was considerably below the amount the defendants had paid into court. Apart from the mining operations, he did not consider the plaintiff's land eligible as a building estate.—Mr. James Lee Space, surveyor, of Oldham, said that the land was not suitable for building, because, being between the river Trent and a feeder, it was damp and liable to floods.—Mr. Jelf: But is not a river considered an advantage in selecting a site for a house?—Witness: Not such a river as that.—But surely you are not going to say anything against our Trent. It is a very

nice river, isn't it?—It is a very nasty river at times.—Witnesses who had worked in the mines stated that there had been breakings in of water from above sufficient to cause what subsidence had taken place. It was also stated by residents in the neighbourhood that the recreation ground and race-track and the roads near the plaintiff's estate had not had to be raised within the last twelve years.—Mr. Greene, Q.C., having summed up the defendants' case, Mr. Jelf replied, and his lordship summed up, asking the jury to decide first of all whether they considered any damage at all had been caused by the defendants. The jury found that some damage had been caused. His lordship then summed up the evidence as to the amount of damage, and explained to the jury that they were not necessarily bound to give 200*l.* because the defendants had paid that sum into court. This might have been done to avoid the costs of the action.—The jury found for the plaintiff, damages 120*l.* more than the amount paid into court, making 320*l.* in all. An injunction to restrain defendants from further damage was granted.

## REMINISCENCES OF A CONTRACTOR.

AN account of an interview with Mr. S. W. Pilling, of Bolton, railway contractor, is given by the *Bolton Chronicle*, in the course of which Mr. Pilling referred to his father, Mr. Abraham Pilling, who was a member of the Bolton Corporation for twelve years up till 1874. He resides at present in Southport, where he is a member of the Town Council and chairman of the Finance Committee. His son stated that the ex-alderman laid in 1845, or thereabouts, the foundations of the railway business now under Mr. S. W. Pilling's control, adding:—"My father hailed originally from Huddersfield—he was born at the village of Lindley, near there—but settled in Bolton in 1843, as contractor's agent on the Bolton and Blackburn Railway (then in course of construction). In 1845 he launched into business on his own account. Being a Yorkshireman, and, as most Yorkshiremen are, a man of grit, he soon made his mark. At first his operations were confined to the erection of public buildings—churches, offices, and the like—but his *forte* lying in railway and river works, he gradually laid himself out for that business."

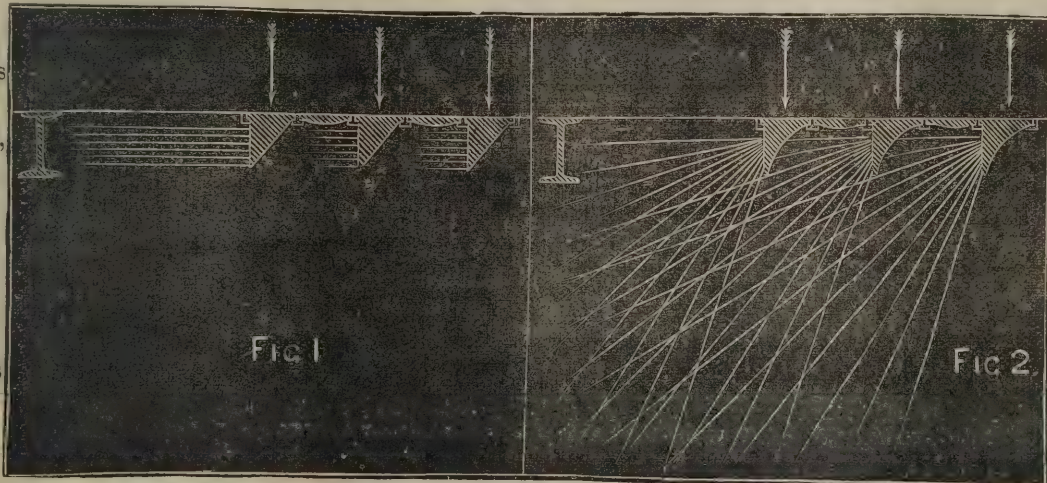
"What particular lines did he construct?"

"Well, there was, just speaking from memory, the Boar's Head and Adlington section of the North Union Railway; a branch at Sutton Oak, St. Helens; the Bolton and Worsley

# Wilson's Patent Dioptrical Pavement Lights.

WILSON & CO. beg to call the attention of Architects and others to the superiority of Wilson's Patent Dioptrical Lenses for pavement and floor lights. These Lenses are constructed on strictly scientific principles, and have been approved by some of the highest authorities on light. They are made of the Best English White Flint Glass of high refractive power, and transmit more light than any other form of lens yet introduced. The reflecting surface being spherical, the rays of light are distributed in every direction.

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Fig. 1 shows how the ordinary prism or semi-prism, by receiving the rays on a plane reflecting surface, throws them forward at one angle only, in parallel lines close to the ceiling.

Fig. 2 represents the Patent Dioptrical Lens, and shows by comparison how the rays of light, striking on the curved inner surface, are reflected forward through the face of the lens in every direction, filling the whole angle of 90°, thus illuminating the apartment from floor to ceiling and from wall to wall.

From the above diagram it will be seen wherein consists the advantages claimed for Wilson's Patent Lenses. The objection to the semi-prism is that it reflects the light, as shown in Fig. 1, at such an angle as to be of little use, and more especially if the line of the ceiling is low the line of the pavement; then the value of the semi-prism as a light projector is entirely lost.

It will be seen also, on reference to the above diagrams, in Fig. 1 that the first row of semi-prisms obstructs the rays of light from each succeeding row, whereas in Fig. 2 the bulk of the rays of light are projected at such angles as to pass unobstructed into the room.

The correctness of these illustrations can be practically demonstrated to any architect desirous of testing them.

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line, with stations and goods depôts, on the London and North-Western Railway; the Astley Bridge branches on the London and Yorkshire system, with other works, such as bridges, and widening of line, and for the same company; the Ayrshire and Wigtownshire Railways, in the south-west of Scotland, thirty-five miles; all this was previous to the year 1877, when I joined my father in business."

"What age were you at that time, Mr. Pilling?"

"I was born in 1856, consequently I was just twenty-one years old. My birthplace was Bolton-le-Moors. When nine years of age I was sent to Southport, to the well-known school, Bickerton House, Birkdale, and remained there as a pupil of Mr. Mathwin's for six years, and this was a happy period of my life. Not only were our studies considered an important part of a boy's education, but our respected master insisted upon proper outdoor exercise such as cricket, football, boating and the like."

"You had a pretty stiff dose of schooling then?"

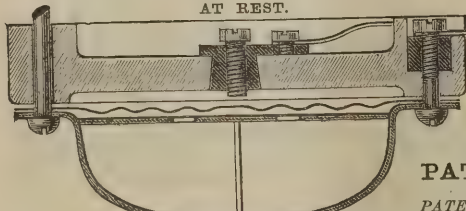
"Oh! but I hadn't finished when I left Bickerton House, for I was straightway despatched to Manchester to attend classes at Owens College. Then, having acquired there something of the theory of railway engineering, I was sent, as an articled clerk, to learn the practice of it on the Ayrshire and Wigtownshire Railways; and, finally, I landed in the office of Mr. George Woodhouse, architect, Bolton, with the object of picking up all I could about the construction of buildings. I had splendid opportunities while with Mr. Woodhouse. That gentleman was, I may say, at the head of his profession in Bolton. He designed the fine town hall and gas offices there, and satisfactorily carried through their erection. He was also architect of numerous mills and chapels in and around that busy B. Singularly enough Mr. Woodhouse and my father were natives of the same village near Huddersfield, and had been boys together there."

After an incidental reference to his father, while serving in the Bolton Town Council, having "filled the important office of chairman of the Sewage Works Committee at a time when the application of science to the system of sewerage was just coming into play, in the discharge of the duties of which office his practical knowledge of course stood him in good stead," Mr. Pilling informed his interviewer that while he was in partnership with his father from 1877 to 1880—in which last-mentioned year the latter retired into private life—the firm constructed "the Salford Corporation outfall sewage works, at Mode Wheel, costing about 60,000*l.*; also several sections of

the intercepting sewers connected with the same borough; the Wallasey new bridge over the Irwell, costing about 25,000*l.*; the Cromwell new bridge, costing about 12,000*l.*; the Springfield Lane, costing about 15,000*l.*; and the laying of tramways in connection with the Astley Bridge section of the Bolton and Suburban system. Previously to my joining my father he had constructed eight other bridges over the river Irwell, including Trafford Bridge, Palatine Bridge, Agecroft Bridge, Ringley Bridge, &c. Since my father's retirement I have constructed Baldwin's Bridge, which connects Eton with Windsor; the three-arched bridge which spans the Ouse at Bedford, visible from the Midland Railway; Farnworth Bridge, near Bolton; and an aqueduct over the Ribble for the Blackburn Corporation. In Bolton I have been entrusted with the building of gasworks, viaducts, and tram lines; in Leicester I built the 'flood works,' which cost nearly 60,000*l.*; in Huddersfield I laid 14 miles of tram lines. It was while engaged on the last-named work that I resolved to let my house near Bolton and reside at Mirfield, taking a temporary residence until my present abode, 'Crow Lees,' became at liberty. In 1879 I was married to the daughter of Mr. Marmaduke Fox, of Marmaville, Mirfield."

The conversation turning next to Mr. Pilling's connection with his favourite hobby of music and organ-playing, he described the private organ he has at home as an instrument 25 feet high, 20 feet wide, and 16 feet deep, and blown by hydraulic engines, the pressure travelling a distance of 60 feet. It has four manuals and fifty-two stops. The "solo organ" is on 8-inch wind pressure, and the latest improvement of tubular pneumatic action has lately been applied by the builders, Messrs. Brindley & Foster, of Sheffield. Mr. Pilling added that since the year 1875 he had drawn the specifications of, and had opened—that is, played at the inaugural ceremonies of—some seventy-two new organs in different churches and chapels throughout the country, he having made a complete study of the organ, both inside and out. "I have," he continued, "played at these inaugural services as an amateur only—that is, without fee or emolument, for I have ever been jealous of trespassing on the preserves of the paid organists. For example, I at present hold an honorary Sunday appointment in a town three miles from my home. The church possesses an exceptionally good organ; and, conditionally upon my acceptance of the position, the congregation still retain the services of their professional and venerable organist, who receives upwards of 50*l.* yearly, and according to my arrangement will do so as long as I have the direction of the musical services of the church."

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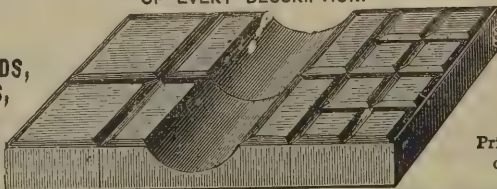


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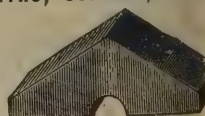
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## REGISTRATION OF PLUMBERS.

At the City and Guilds Institute, Finsbury, on Monday, an examination was held, under the auspices of the Worshipful Company of Plumbers, for certificates of registration. The practical examination included various branches of leadwork, and the theoretical questions relating to the several subjects of plumbers' materials, house fittings, and sanitation. Plumbers attended from Fordingbridge, Exeter, Tunbridge Wells, Ryde, Bicester, Margate, and various districts of London. The examiners were Mr. Charles Hudson, assistant chairman of the registration committee, and Messrs. Ashdown, Davis, Lobb, Lyne, Millis, Smeaton, Taylor, and Webb. Rather less than 50 per cent. of those attending passed the full examination.

## PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

## APPLICATIONS FOR PATENTS.

10492. Charles Scott Snell, for "Improvements in holders for incandescent electric lamps." July 20, 1888.  
 10515. John V. Auth, for "An improvement in window-glass setting." (Complete specification.) July 20, 1888.  
 10544. Frederick Sawyer Winsor, for "Improvements in flushing tanks or cisterns." July 20, 1888.  
 10550. John Pullar, for "Improved safety lock fast gear for actuating fanlights." July 21, 1888.  
 10578. Anthony Dunderdale, for "Improvements in collapsible or folding shutters, window guards, sunshades, gates, balconies, and the like." July 21, 1888.  
 10610. Joseph Kaye, for "Improvements in locks." July 23, 1888.  
 10673. Richard Wright, for "Self-locking window-sash fastener." July 24, 1888.  
 10678. Richard Smith Casson and Benjamin Talbot, jun., for "Improved gas-furnace." July 24, 1888.  
 10706. George Evans, for "Improvements in construction of window frames and hanging the sashes." July 24, 1888.

10742. George Stubbs, for "Improvements in the construction of gas-cocks." July 25, 1888.  
 10756. Alfred Butterworth, for "A shadowless gas globe." July 25, 1888.  
 10757. Friedrich Wendling, for "A new paint for stone, plaster, and the like." July 25, 1888.  
 10770. Henry Lee Hind, for "Improved door fastener." July 25, 1888.  
 10789. William Thomas Wright (trading as Wright & Davies), for "Improvements in drinking flasks." (Complete specification.) July 25, 1888.  
 10791. John Partridge, for "Improvements in roller-blind fittings, which he entitles 'The roller blind fixing and cover lath.'" July 25, 1888.  
 10798. George Drinkall Jefferson, for "Improvements in ovens for domestic and other purposes." July 26, 1888.  
 10801. Gilbert Henry Garrett, of Robert Stephenson & Co., Limited, for "Improvements in traps for sanitary and other purposes." July 26, 1888.  
 10842. William Davies, for "Improvements in flushing apparatus more especially adapted for flushing urinals." July 26, 1888.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

7618. William Ross, for "Improvements in bricks." May 24, 1888.  
 8963. William Sayer, for "Improvements in means and apparatus for manufacturing bricks, tiles, and the like." June 19, 1888.  
 9054. William Peyton, for "An improved chimney head or pot." June 21, 1888.  
 9343. Frederick Hodges, for "Improved means for mitreing mouldings and the like." June 26, 1888.  
 9388. Arthur Ramsden, for "Improvements in sewer and other pipe joints." June 27, 1888.  
 9591. Edward Thorp, for "Wind and water bars for meeting rails, top and bottom rails of sliding sashes, top rail and stiles of casement sashes, top rail and stiles of doors." July 2, 1888.  
 9760. Richard William Pyne, for "Improvements in fastenings for doors." July 4, 1888.  
 9761. James Stuart Palmer, for "Plastic wall decoration composition." July 5, 1888.  
 9816. Edgar Newton, for "Improvements in apparatus for actuating the lights or ventilators of horticultural buildings and the like." July 5, 1888.

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## TESTIMONIALS.

SIR.—I have much pleasure in testifying to the efficiency of your patent warm-air fire-grate. It has been very successful, and given every satisfaction where I have used it.

Yours, &c., JAMES WEIR, F.R.I.B.A.,  
6 John Street, Bedford Row, W.C.

From ARTHUR W. BLOMPFIELD, M.A., Esq., Architect,  
28 Montagu Square, London, W.

Mr. Grundy, of Tyldesley, near Manchester, has carried out his plan of warming in several churches built under my direction, and in each case it answers remarkably well, and has given great satisfaction.

From Professor W. B. ROBERTSON, M.D., West Dulwich, S.E.,  
September 1, 1887.

DEAR MR. GRUNDY.—I value your apparatus very highly indeed. I regard it as the greatest comfort I have in this house.

From Rev. A. FERGUSON SMYLY, Dean of Derry, The Deanery,  
Derry, September 16, 1887.

DEAR SIR.—I cannot refuse to give you a few words of commendation as to the apparatus you supplied for heating Derry Cathedral. Not only is the air of the Cathedral quite pure and pleasant to those attending the services, as it must be from the fact that most of the air heated is taken from the outside, but I find the building itself is so much benefited, as formerly it was damp and smelt damp, but now it is very dry and free from any musty smell. I find that, although the Cathedral is now much larger, the cost of firing is much less.

To Mr. John Grundy, 30 Duncan Terrace, City Road, London.

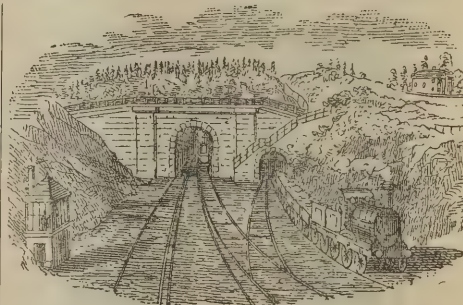
From Hon. and Rev. G. G. C. TALBOT, M.A., Withington,  
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DEAR SIR.—You will be gratified to hear that the school is completely warmed by your new grate. It is the most economical and efficient that I have ever seen.

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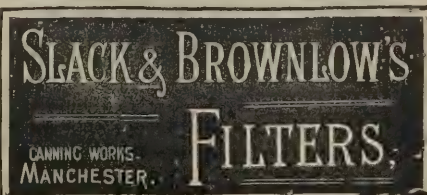
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Note.—No Connection with the other BATH  
STONE FIRMS.





10100. George Cope Dixon and Walter Pretyma, for "Improvements in safety sash or window fastenings." July 11, 1888.

10212. James Matthew Matthews and Frank Buckland, jun., for "Improvements in locks and fastenings for railway and other carriage doors, and for other purposes." July 13, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of this journal, give notice at the Patent Office in the prescribed form of such opposition.

12362. Proctor Barrett, for "Improvements in means applicable for the counterbalancing of window sashes." September 13, 1888.

12817. Maximilian William Henry Clarke, for "Improvements in fireproof curtains for theatres, music-halls, and similar buildings." September 21, 1887.

12872. Mark Henry Blanchard (trading as M. H. Blanchard & Co.), for "Improvements in bricks for wells, and such like purposes." September 22, 1888.

17061. Deborah Jane Procter, for "Improvements in the construction of candle shades or reflectors, and in the means of attaching the same to candles." December 12, 1887.

3608. Harry John Burgess, for "Bib-taps." March 8, 1888.

8808. Henry Harris Lake, for "Improvements in metallic roofing-plates or shingles." June 15, 1888.

#### PATENTS SEALED, JULY 27, 1888.

9887. Jesse Rust, for "New and improved material for colouring paints, cements, and other substances." July 14, 1888.

13472. John Coppard, for "Improvements in the construction of appliances for closing or opening doors, windows, and other structures, for which such openings are used." October 5, 1887.

14422. George Frederick Newman, for "Improvements in door springs and checks." October 24, 1887.

4900. Henry Harris Lake, for "Improvements in weather strips for doors, windows, and the like." March 31, 1888.

5688. Horace Frederick Fuller, for "Improved means for facilitating etching in colours." April 17, 1888.

#### ABRIDGMENTS OF SPECIFICATIONS RECENTLY PUBLISHED.

"Improved apparatus for disinfecting water-closets, lavatories, and other similar purposes." No. 7602. 1888. W. L. Simmons & E. A. Simmons, 201 High Street, Stoke Newington. This is an ingenious invention, by means of which a limited quantity of disinfecting fluid can be discharged from a small tank into the pan of the water-closet or other similar article. A tube is hinged in the tank with a tap at its base, and this tube lies horizontally along the bottom of tank when at rest and the tap is shut off, and when the tube is raised by means of a lever to a vertical position the tap at base of tube is opened, and the disinfecting fluid contained in same is discharged through a pipe into the vessel required to be disinfected. A weighted lever compels the return of the tube to bottom of tank, where it refills for next action. The tube can be actuated by means of the pull-handle of the water-closet.

"A method of fixing wood linings and the like for walls and ceilings." No. 11,103. 1887. F. W. Jones, 210 Bute Road, Cardiff. A new method of fixing wood linings, such as door jambs, panelled dados, &c., more particularly useful for covering up sanitary work that requires occasional inspection, and consists of an iron flanged casting; one flange is built into wall, and other flange projects as required, and is tapped with screw holes to take screws that go through the framing.

"Improved mouthpiece for speaking-tubes." No. 194. 1888. W. Frazer, 6 Livery Street, Birmingham. The orifice of the mouthpiece is closed automatically after the same has been used or spoken through, and only one of the alarm whistles sounds, though both whistles remain in the body of the connection carrying the mouthpiece when the tube is blown through.

"Improvements in the manufacture, &c., of articles of a cylindrical form." No. 7635. 1888. G. R. Wilson, 1 Paul Street, Finsbury. This invention consists of applying corrugated metal whose section, taken at right angles to the direction in which the corrugations run, forms a regular and continuous curvilinear line, these corrugations being always in a vertical direction.

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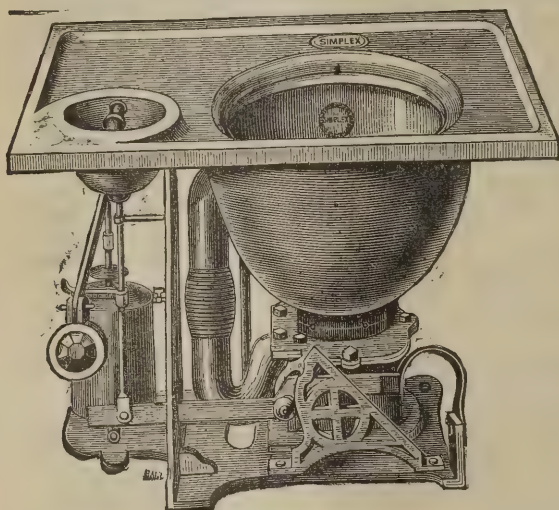
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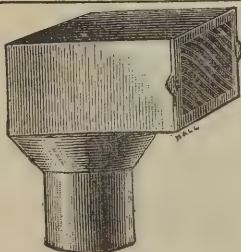
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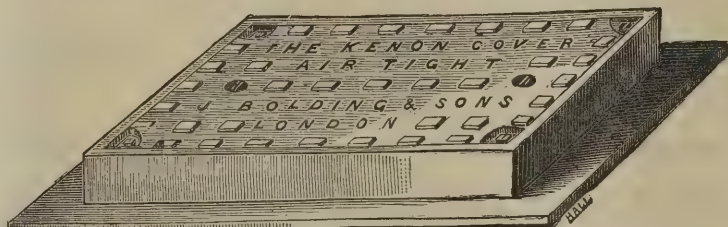


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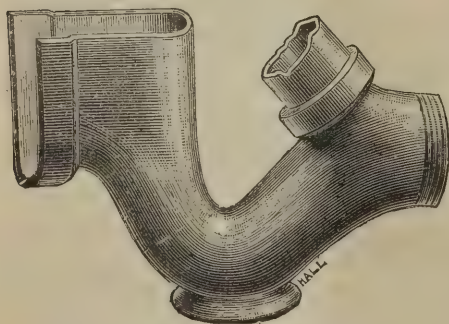
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# The Architect.

## THE WEEK.

A MEETING of the trustees of the "Alexander Thomson" Memorial was held in the Religious Institution Rooms, Glasgow, on Wednesday, the 1st inst., and Mr. DAVID THOMSON, president of the Glasgow Institute of Architects, occupied the chair. At this meeting Mr. WM. JAMES ANDERSON, who gained the architectural travelling studentship in December last, submitted the sketches which he had made during his tour in Italy, together with a manuscript descriptive memoir. The sketches, sixty-four in number, with nine sheets of measured drawings, were exhibited on the walls and carefully examined by the trustees, who felt extremely gratified with them, as evidence of Mr. ANDERSON'S diligence and industry while on his tour, and of the skill and ability which he has displayed. It is highly satisfactory to find that in this, the first competition for an architectural studentship in Scotland, such meritorious drawings were sent in by the candidates, and, now that the prizeman has made the tour, that he has performed the work required of him in this manner. It is gratifying to learn that, in the national competition at South Kensington, the silver medal has just been awarded for the drawings of the prizeman, and that the competitive drawings of two of the other candidates for the Alexander Thomson Studentship have also gained prizes at South Kensington.

THE funeral of the late Mr. FRANK HOLL, R.A., took place on Tuesday, in the cemetery at Highgate. Among the friends of the late artist assembled in St. Peter's Church, Belsize Park, and in the cemetery, were Sir Frederick Leighton, Sir John Millais, Messrs. Horsley, Goodall, Alma Tadema, Seymour Lucas, Brett, Hodgson, Storey, Burgess, Dicksee, Poynter, Phil Morris, Sant, Wells, Edwin Lucy, Henry Moore, Marcus Stone, Luke Fildes, Carl Haag, Gow, Dicksee, Du Maurier, Felix Moscheles, Clayton, Boehm, Onslow Ford, Riviere, Orchardson, Val Prinsep, Humphry Ward, Frith, Stacy Marks, Oules, Frank Dillon, and Thornycroft. The Council of the Royal Academy have decided that a principal feature of the next winter exhibition at Burlington House shall consist of a representative selection of the works of the late Mr. FRANK HOLL.

VISITORS to Mont St.-Michel this year will be able to inspect the new museum in the abbey, which is founded by the French Government with the aid of the Commission on Historic Monuments. It was opened last week. One of the features is a series of paintings illustrative of events in the history of the abbey. The French authorities now find it an advantage to make use of historical paintings in their buildings, and although there are great historians among the French, it is found that the painters are better able to aid the public to realise historic scenes. An opportunity is also given for works of a higher class than the everyday incidents which are the favourite subjects with most patrons. We might with advantage imitate our neighbours, for few buyers of pictures in England care much for historical subjects.

AN important Blue-book has been issued this week on the action of light on water-colours, which contains the report of Dr. RUSSELL and Captain ABNEY, or rather the first section of their report. These gentlemen take the opportunity of recording their thanks to the committee of artists for suggestions in course of the investigation and criticisms on various points of the report. The book contains nearly one hundred pages, and included are explanatory diagrams and plates. The report must be perused in its entirety to do it justice, and it will well repay the trouble. The controversy on the permanency of water-colours which took place lately was, it will be remembered, the primary cause of the inquiry which has been started, and which has been prosecuted with the most praiseworthy thoroughness. The second report, which has yet to appear, will deal with the chemical changes, but what has already appeared cannot fail to throw a most interesting light on many other points affecting pigments and their use, besides those points in dispute. Whether it will help Sir J. C. ROBINSON and Sir JAMES LINTON to come to some settle-

ment on the question of permanency of water-colours, or whether they may find in it proofs to support their own views remains to be seen. Broadly speaking, it would seem that damp or moisture is the great enemy to be guarded against. The spectroscopic investigation points to the blue rays of light being the chief agents for change, where change has occurred from light. This seems natural, as the same sort of thing is the case in photography, where the changes are effected, or, in other words, the picture produced, by the action of blue rays of light.

THERE is some dissatisfaction among the painters of Brussels who have sent works to the Triennial Exhibition of Antwerp. They maintain that the best places are occupied by Antwerpians, and, as there is jealousy between Antwerp and Brussels, it is not surprising that the painters of the capital declare they will not exhibit in the city on the Escaut. The triennial exhibitions are, in fact, an anomalous institution. If intended to display local art, they should not be made up of works which come from a distance. In Antwerp there are French and German pictures, as well as some from most towns in Belgium. As the exhibitors have become national and cosmopolitan rather than local, they should not be managed by a committee that must be inspired by local sympathies.

THE Society of Arts offer prizes to art workmen for the session 1888-89, in pottery, stone carving, wrought-iron work, and goldsmiths' and silversmiths' work. The prizes in the last class are presented by the Goldsmiths' Company, and are offered for a cup or sugar basin of beaten silver, chased or otherwise. First prize, 20*l.*; second prize, 5*l.* A pendant brooch or locket of gold without gems. First prize, 20*l.*; second prize, 5*l.* Nineteen prizes are offered in the class of pottery, four in the class of stone carving for the capital of a column, and three for a wrought-iron grille. All articles for competition must be sent in to the Society's house on or before Tuesday, April 23, 1889. The conditions under which these prizes are offered can be obtained on application to the secretary.

THE annual meeting of the Royal Scottish Arboricultural Society was held on Tuesday in Edinburgh. On the subject of forestry the chairman advised the planting of waste or unproductive lands with timber, mentioning that there were about twelve millions of acres, nearly all included in the large estates of the United Kingdom, the annual value of which did not exceed an average of 1*s.* 3*d.* an acre. Allowing a deduction of one-third for high altitudes of land unsuitable for the growth of forest trees, there still remained eight millions of acres of land which might be covered with forests to the mutual advantage of the owners and the benefit of the country. The total area now under woodlands in the United Kingdom was about 2,788,000 acres, the smallest proportion to the total acreage of the country that was to be found in any well-regulated European State.

THE students of the classes of sculpture in the Ecole des Beaux-Arts have been more fortunate than their brethren of the schools of painting, since the Prix de Rome has not been withheld. M. CONVERS, a pupil of MM. CAVELIER and AIMÉ MILLET, has gained that distinction. The model of M. THEUNISSEN was deemed worthy of the second prize, and M. H. LEFEBVRE gained the third. Both are students of M. CAVELIER, who has had consequently a share in the teaching of the principal prizemen. In the section of engraving M. HENRI LERICHE has gained the Prix de Rome, M. CHIQUET was placed second, and M. DETURCK third.

THE relations between Russia and France being for the time most friendly, the northern empire is likely to be better represented in the Exhibition of next year than most other nations. At present subscriptions are being raised in St. Petersburg for the purpose of constructing in the Champ de Mars a model on a very large scale of the cathedral church of St. Isaac, which is so dear to all Russians. It will be an expensive work. On the closure of the Exhibition the model will be presented to the City of Paris, and probably will find a permanent place in the collection of the Ecole des Beaux-Arts.



## MR. ROYLE'S ADDRESS.

THE address delivered by Mr. ROYLE to the Manchester architects, which we published last week, resembles most documents of the kind; that is to say, it is a summary of information which must have been familiar to all who were present at the delivery of the address. The president of the Manchester Society of Architects followed the pattern set up of late in Conduit Street, and took care to be safe by keeping to commonplaces. Mr. ROYLE is an architect of standing, but not even gratitude for attaining the presidential chair could draw out of him one fact which might be considered as a contribution to professional knowledge.

It is strange that an architect when he is about to compose an address of the kind will not turn to some other source of inspiration than the dull volumes of the Royal Institute of British Architects, which are most efficient aids to fill up the shelves of a bookcase and keep useful books erect. A glance at the reports of proceedings in other professions would suggest more profitable models. The president of a medical society in the provinces, as in London, will always be found to select a subject which he endeavours to elucidate with the aid of his own knowledge and experience. It is felt to be incumbent that the head of a society should make it plain that he was competent for better duties than talking on things in general. Let us see how Mr. ROYLE endeavoured to enlighten the members who are under his authority for a year or more.

Mr. ROYLE began with the architectural division of last year's Exhibition in Manchester. That is a subject which should make every member of the Manchester Society of Architects ashamed of himself, for since exhibitions began there was not one more unfair in the arrangements or more unsuccessful in results. Mr. ROYLE admits that "probably no section of the Manchester Exhibition was less seen or less carefully examined than the Architectural Court—a fact which perhaps accounts for the very little attention it received from the general newspaper press." We may take some credit for that neglect, for we were the first to expose the pretensions of the collectors, and whenever we see an absence of fair play in the arrangements of an exhibition we shall be equally outspoken. Mr. ROYLE confesses that the number of drawings representative of Manchester and its suburbs was disproportionate, if he took account of the buildings erected elsewhere by Manchester architects which were represented. The President might use a still stronger term. He says that "if the historic idea had been more closely kept in view the display might have been more adequate." But he has not the courage to say why that idea was set aside in an Exhibition which professed to be historical. The architectural section was in truth of a mongrel kind; it was not complete from any point of view, there was a good deal of selfishness about it, and we must congratulate the factory operatives and other sightseers who showed their sense of justice by repressing their curiosity. When the part of the building near the great organ was assigned to architecture, there was much trumpeting about the diplomatic victory of the Manchester Society of Architects, but now the President considers that the place was "unfortunately situated." As well as we recollect the architectural section was capitally placed. There were no paintings or manufactures to disturb the vision. With prudent management the walls could have been made attractive, and there is no use now in attributing the failure to any other cause except the action of the Society and its representatives.

Mr. ROYLE wisely avoids giving any criticism of the Architectural Exhibition, and says it is no part of his duty "to draw any conclusions as to its general character or to attempt to estimate its quality." But under other circumstances a criticism of the works should be the principal subject of his presidential address. Exhibitors who are living did not gain any benefit by having their buildings exhibited at Manchester, and they had a right to expect at least some assessment of the merit of their works, but Mr. ROYLE could not be frank in judging the collection unless he said much that would be disagreeable to some of his hearers. The President had a most desirable opportunity to treat of modern architecture, but apparently he dared not

take advantage of it. He must have felt that too little cannot be said about the only fiasco which stains the history of the Jubilee Exhibition. The wonder is that the majority of the Society do not repudiate every attempt to connect them with last year's mismanagement.

After the flagrant failure of the Society to realise the idea of the Exhibition, and their inability to cover two walls in a satisfactory style, no one need wonder at the hesitation of the City Council (some of whom were members of the Exhibition Council) to make use of the aid of the Manchester architects in remodelling the by-laws. "The municipal authorities," says Mr. ROYLE, "have not availed themselves of our offer of assistance during the process of revision." All that is asked of the Society is to become a sort of proof-reader for technical terms, in order, as one of the aldermen said, "to insure something like accuracy in the description of the various parts of buildings"! To that position NEMESIS has brought down the Manchester architects in consequence of their desire to turn the Jubilee Exhibition into an advertisement. The disesteem of the City Council can, however, be carried too far. Although there was an effort last year to monopolise the greater part of the walls, it does not follow that the architects who were so moved are incompetent to give suggestions about by-laws for building. It is, of course, hard to forget that the Exhibition would have been an entire success if the architects had had no share in the arrangements, but in that case they were undertaking novel duties which entailed self-sacrifice, whereas all their experience is of a kind that could be utilised by the Council with advantage to the citizens of Manchester. We therefore advise the City Council to ignore the mistakes of the Exhibition. But, on the other hand, the Manchester Society should make it plain that they have more self-respect than was shown by the Royal Institute of British Architects in respect to Northumberland Avenue, and will not submit to snubbing for the sake of recognition. Why should the proof-reading be undertaken, if that work is the limit of the Council's confidence? Although the Society may be under a cloud since last year, it must still have sufficient power to resist any attempt to make it a tool or a convenience.

In a competition with business or money-making, art must never expect to take a foremost place. What is the use of talking about the effect of telegraph wires upon the sky-lines of an architect's composition? It is in vain to expect that the Manchester merchants will remove conveniences which have become like parts of themselves because they do not aid in producing architectural effect. Let Mr. ROYLE and his fellow-members devise a way of having telegraphic communication with invisible or concealed means, and then it will be reasonable to seek an alteration of the present system. Nor is much gained by describing the erection of "chimney funnels on bases of red bricks" upon a stone building as "a monstrous abortion," an "outrage" and an "enormity," when it is likely that in a short time the new and the old work will differ but little in colour. Repose is as needed in writing as in building, and there is not much likelihood that the people of Manchester will be converted to a sense of the beautiful through the power of annoying adjectives.

We hope a prosperous time for the architects of Manchester will follow the completion of the great canal. But they may be assured that if impediments of an æsthetic sort are raised against the requirements of men of business, engineers, builders, and others will be forthcoming to take their places. One of the misfortunes of our time is the prejudice against architects on account of their supposed indifference to all considerations except the picturesque appearance of a building, and when we find men of the rank of Mr. ROYLE objecting to architects being "tied down by the false ideas of owners and tenants," or, in other words, suiting the requirements of the men who give the commissions, we must think that common sense is needed in Manchester on other matters besides the arrangement of an exhibition. Would it not also be wiser to suppose that there must be some more reasonable cause for the great warehouses being found in Manchester—in Salford rather—than "prejudice, sentiment, or force of association," which are Mr. ROYLE's assumed causes? The owners of such buildings are hard-headed, and are not likely to be the slaves of sentiment. But we must agree with Mr. ROYLE



that it would be a good work to raise the character of Salford, to cover the Irwell in the city, and to make an open space near the Exchange Station that would be creditable to Manchester.

Mr. ROYLE, it will be found, has much to say about the future condition of the Institute, and he is so sanguine and imaginative as to suppose that it "is the duty now of all properly qualified architects to connect themselves with the Institute, as the profession generally will thereby gain very much in the estimation of the public." We fancy Mr. ROYLE must be so absorbed by his duties as to be unable to mix much in society, or he would have known that the British public cares less about the Institute than any other body of men. Let him ask a few of the merchants or manufacturers about the Institute, and he will be surprised at the deficiency of their knowledge on the subject. After fifty years of continuous failure, what else is to be expected? Yet, strange to say, Mr. ROYLE can offer no other inducement than "the estimation of the public" to the architects who have not yet had their names enrolled in Conduit Street. He supposes there will be a broader basis, an attention to the views of provincial members, an uniform set of regulations throughout the country, and so on, but the great thing is the "estimation of the public." One might suppose that people who have commissions to give have the list of the members of the Institute before them, and seek out every new addition with fervour. Allowance may be made for collegians who think that political readers watch their mimic debates, and are ready to seize upon whoever holds his own, but for grown men to be under the illusion that the public will change disesteem into esteem if they join the Institute is absurd.

We are quite sure Mr. ROYLE could have composed a far better address if he had trusted to himself. But evidently he had before him a speech by one of the itinerant agitators of the Institute, and felt in duty bound that he must repeat the conventional phrases about the liberal and friendly spirit, the access to rooms and library, the increase of power to provincial societies, which are known wherever architects congregate. Twenty years hence the president of the Manchester Society may be expected to talk in a similar strain, and with as little evidence of any advantage to the members from their association with the Institute. Then, as now, the benefits may be expected to be of a prospective kind, and as far from realisation as they are at present.

#### CANTERBURY CATHEDRAL.

THE committee appointed to make an antiquarian investigation in Canterbury Cathedral have just presented their report. This investigation took place owing to remains having been found which it will be remembered were thought might have been those of St. Thomas à Becket. The document states that explorations in the crypt would tend to show that the lower portion of the west wall must have been part of the pre-Norman crypt, and the character of the plaster seems to suggest the possibility that it formed part of the original building granted to St. Augustine. Eastward of the lady chapel the furthest extremity of Ernulph's crypt has been traced, terminating in a rectangular chapel. Between the west face of the wall of the rectangular chapel and the next vaulting shaft a hollow, extending about 3 feet below the surface, and filled in with rubble, seemed to indicate what was the position of Becket's coffin from 1170 to 1220. Near by the explorers discovered two long steps of Purbeck marble, originally, no doubt, the steps of approach to the altar of the tomb of the martyred Archbishop. About 4 feet west of the lower step, in a direct line with the central shafts, was found the narrow end of a stone coffin, 6 feet 2 inches long. It was hewn from a solid block of Portland oolite, and was covered with a thin slab of Merstham or Reigate freestone, utterly unfitted for such a purpose. The earthen floor was full of large fragments of wrought masonry which had formed small arches, elaborately moulded in Early English style (*circa* 1220-1230). Small round shafts and bases, and other fragments of Norman arches were also found. The head and base of a bishop's or archbishop's effigy beneath a canopy were found in the same place. They are sculptured in Purbeck marble in high relief. An early floor of white plaster was traced about 6 inches below the present level. This part of the crypt was walled off and made a private cellar (A.D. 1546), being appropriated to Richard Thornden, second bishop of Dover, under the name of "the vault called Becket's Tomb," so that the moulded masonry in the floor must have been placed there before 1546. The stone

coffin contained human bones, gathered together towards the middle and upper portion of the coffin, and mingled with earthen *débris*. At the head was a boulder-stone hollowed as if to form a pillow. It had been broken across the middle. The remainder of the report deals with the question of identity, of which no distinct evidence is forthcoming.

#### WESTMINSTER ABBEY.

A VISIT has been made on the invitation of Canon Westcott to Westminster Abbey, by members of the Oxford Diocesan Church History Society, from the Wokingham district, in connection with the period of church history selected for investigation during the present year, a period that includes the reigns of Henry III., the three Edwards, and Richard II. A preliminary meeting had been held at Wokingham, in which the Rev. A. Carr, vicar of St. Sebastian, Wokingham, spoke of some of the leading points to which attention should be drawn in view of the proposed visit, and in preparation for Canon Westcott's notes on the history and architectural features of the abbey. The greater part of the existing church was built in the reigns mentioned above. It was indicated as a point of interest and full of teaching that the addition of six bays made under Henry V. by the famous Richard Whittington, while retaining the essential features and proportion of the thirteenth-century work, introduced fifteenth-century details which marked the epoch of the change. The break in uniformity made by Henry VII.'s chapel was shown to be significant of the historic break of that time, when a new era began for English history. The visitors first examined the monuments before that period, and next Henry VII.'s chapel. The variety of workmanship in the monuments of the earlier period was pointed out by Dr. Westcott—Limoges enamel admirably preserved in places, as on the shield of William de Valence—fragments of delicate wood-carving—the metalwork on the effigies of the kings—the sculptured work on the tombs, especially on that of the Countess Aveline, wife of Edmund Crouchback—and the still beautiful mosaics in the sacrum brought from Rome in the thirteenth century. The visitors were able to look down from Henry V.'s chantry on to the iron-barred chest containing the body of Edward the Confessor in the shrine below. The chapter-house was also visited, in which for nearly three centuries the House of Commons sat, and in which were passed the Acts which formed the Reformation Settlement.

#### PETERBOROUGH CATHEDRAL.

IN the course of the excavations necessary for underpinning the interior of the north transept of Peterborough Cathedral, an interesting discovery has been made, of which the Dean of Peterborough gives the following account in the *Times* :—

Close to the western wall of the transept the workmen came upon a richly ornamented Saxon slab, covering a grave, and evidently still lying in its original position. It is of the date, no doubt, of the second Saxon church—that in which Hereward was knighted—of which considerable remains were discovered a short time since after taking down and rebuilding the central tower. The slab must mark the grave of a layman, for the burying-place of the monks was on the south side of the building, where a Saxon cloister may have stood, just as the Norman cloister did afterwards. As the slab extended slightly beyond the space required for the excavated trenches to receive the shallow foundations of the present Norman structure, the workmen of that period destroyed a few inches of its length at the top. This, with a crack across near the foot, caused by the settlement of the earth consequent on the Norman excavation, is the only injury the slab has sustained, if we except the possible removal of an ornamented upright cross at the head; the rude footstone is still in its place. The surface of the slab is about 1 foot 6 inches below the level of the late floor, which, in its turn, was about 5 inches above the Norman floor. The length of the slab remaining is about 5 feet 3 inches, with a top width of 1 foot 10½ inches, and a bottom of 1 foot 6 inches.

The surface is completely covered with the richest Saxon interlacing ornament, forming a design of a central band of ornament about 5 inches wide, crossed at right angles by rather wider strips of ornament. Three of these are uninjured; the fourth, at the top, was almost entirely destroyed, as I have already said, when the present transept was built by William de Waterville. The design was originally, therefore, a fourfold cross. Each of these crosses is outlined with a double roll border, the inner one being twisted work. There is thus left between the borders of the cross arms three oblong spaces on each side between the broad central strip and the outer edge of the slab. Three of these are filled in with finer interlacing work, two with star crosses, and one is plain, having been left unfinished.

The slab is probably the most beautiful specimen of Saxon ornamental work of the kind that has come to light.



Some antiquarians who have seen it tell me that they have seen none finer. We have decided to raise the slab, carefully keeping it on its present site, so that it may still mark the resting-place that it originally covered, but in such a way that it will be above the level of the new floor and properly guarded from injury. It was found close beside the spot where rest the remains of Bishop Dove, Queen Elizabeth's "Dove with silver wings." If any representatives of the good bishop's family still exist, they may perhaps be induced to erect a monument to his memory in place of the one which was destroyed by Cromwell's soldiers, and bearing the same inscription.

Portions of other Saxon slabs have also been discovered not far from the one I have described, of similar design but of less elaborate workmanship; also a fragment of what was probably the raised monument of a Saxon abbot, originally standing in the church, the foundations of which have been lately exposed. Of this (Hereward's church, as I have said) we can trace the outline to a considerable extent. The lines of the transept and the choir can be followed in the south transept under the lantern, and in the nave of the present cathedral, but the nave of the Saxon church lay outside the present building. Measurements carefully made show that the present Norman cathedral is exactly double the size of the Saxon church, just as the Jewish temple was double the size of the tabernacle.

### WYBUNBURY CHURCH.

A PAPER was read by Mr. Charles Lynam on occasion of the excursion of the North Staffordshire Field Naturalists' and Archæological Society.

The church, he said, as approached from the east, has an imposing effect, due to its unusual size and the great tower, and being situated at the top of a hill, but on nearing the building it is soon seen that the whole of the body of the church is of modern date and of the poorest type, the provision for large interior galleries necessarily destroying all chance of a Gothic effect. This church was erected by Mr. James Trubshaw in 1836, only a few years after the parish church of Stoke-upon-Trent was erected under the same direction, and the same sort of character prevails in the two buildings, excepting that at Wybunbury there are arcades to the nave and a clerestory more after the fashion of St. James's, Longton. Mr. James Trubshaw must have had a heart totally indifferent to the merits of Mediæval art, or he could not have levelled to the ground such interesting structures as the ancient fanes of St. Peter's at Stoke and St. Chad's at Wybunbury. On a brass plate in the vestry is an inscription recording the dilapidated condition of the former fabric, but too truly "history repeats itself," and at this moment the proud achievement of James Trubshaw is now a fractured and in some parts a falling fabric, and needs another Trubshaw to set it right. More than fifty years have passed since this great galleried church was placed upon the earth; but even this length of time has not added a single feature of interest to it. Its main characteristic was meant to be according to the spirit of the times—a great preaching-house, and there it remains as such, and will do so as long as the running sand beneath it allows it.

In contrast to this modern effort there still stands the fifteenth-century tower, a great and an artistic work. But let the said James Trubshaw be thanked, for by his scientific skill this ancient part of the church was saved from falling. On the same vestry brass it is also written that this tower had declined from the perpendicular no less than 5 feet 6 inches, but he brought it again to its horizontal level, and so it is preserved to us to this day. The upper storey is of modern work, and belongs to the class of design to be seen at Acton, near Nantwich, and at Eccleshall. The three lower storeys are of ancient work, and the western front to this height is a truly noble composition, architectural and sculptural. At the angles for the first stage are massive square buttresses, as at St. Michael's, Macclesfield; on these are placed angular buttresses, giving variety of outline and lightness of effect. In the centre is a deeply recessed doorway, with a pointed arch and outer square head. On each side is a niched figure of a bishop, fully vested. The drapery in that to the north is treated in a straight-lined manner, and that to the south in a wavy form. This stage is divided from that above it by a bold and battlemented cornice. In the next stage as the central feature is a three-light window, with bold mouldings to the jambs and arch, but the original tracery has been substituted by plain curved continuation of the mullions, so that the rich effect of the original tracery is felt to be wanted. On each side of this window is a niched figure. That to the north a winged angel, and that to the south a female saint. The heads of both figures are modern, and very much spoil the figures themselves. In the centre of the next stage is a lofty niche, containing a fine seated figure of the Holy Father, with a strangely attenuated representation of the crucified Son in the front. In all there are these five niched figures in this west

front of the tower, with the central doorway and deeply-recessed window over it, bold buttresses, base moulds, and cornices; few church towers can be named which show such excellence of design, and having the advantage of enrichment of figure sculpture of fine Mediæval character. Originally this tower stood central in the west end of the church and it had a groined roof, the shafts and wall ribs of which still remain. Next the church was a fine arch, of which the side next the tower is still to be seen, but it is now walled up and its eastern face is external, the modern church being placed altogether south of the tower. Formerly this tower formed the main entrance to the church, and its doorway and window above it were seen within the church itself. The stair turret is at the north-west angle, and inside it has a doorway formed in a splay across the north and west walls. This splay prevented the use of groin shafts, as in the other three angles, and the instinctive ingenuity with which this irregularity was overcome is still deserving of observation by the architectural student. The lower storey is now used as a passage to the stair turret and a vestry, in which are preserved the plans signed by Mr. Trubshaw, and drawn with the utmost neatness and care. They are worth preserving as specimens of the draughtsman's skill at the time.

The inscription on the brass plate in the south wall of the tower is as follows:—"The tower of this church having, in the course of several centuries declined from its perpendicular 5 feet 7 inches, was restored to its present position in the years 1832 and 1833 by Mr. James Trubshaw, architect and engineer, of Haywood, near by Rugeley. The body of the church being in decay and falling by reason of a separation of the ground on which it stood was taken down at the same time and built ten yards from its former situation, under the direction of the said Mr. James Trubshaw. F. Mucklestan, D.D., vicar; James Hayes, curate; Robert Green Hill, John Whittingham, churchwardens." There are six bells in the belfry, which have on them the following inscriptions:—"These bells were cast at Gloster, 1791;" "John Rudhall, of Gloster, fecit, 1791;" "The Rev. John Swinnerton, vicar, 1791;" "When you us ring, we'll sweetly sing," "I to the church the living call and to the grave do summon all 1791," "Thomas Brockley and T. W. Perry, churchwardens." There is a striking peculiarity in the lettering of the last inscription, which is engraved and not raised, as is almost universally the case. The plans in the vestry distinguish the "free seats" from those appropriated or "to let," and it is noticeable that the former are very near the doors. The allowance per sitting is 18 inches for adults and 14 inches for children, and the total accommodation figures as for 1,642. The parish clerk shows an engraving of the old church presented to the parishioners of Wybunbury by Mr. John Twemlow, by whom the drawing was made in 1760, and engraved by E. Staller, of London, and published in 1836. The earliest register now preserved in the tower commences with the date November 1558, and the initial letter A would appear to be a reproduction very nicely drawn from some Celtic manuscript. It is characterised by figures of griffins and knotted forms; the writing generally is extremely good, and the books are in excellent preservation. The lines of the tower arch and of the original nave roof are still visible on the eastern face. The two lower stages measure on the outside 14 feet 7 inches north and south, and 15 feet 7 inches east and west; the third storey 15 feet 2 inches north and south, and 15 feet 7 inches east and west. There is a boldly projecting corbel table carrying the bell framing. The walls are about 4 feet 6 inches in thickness. The masonry of the tower is well built, in the manner characteristic of its period. The architect irresistibly lingers about its base, and leaves it with regrets that his eyes had not seen it as the central feature of an ancient church, with its original upper storey, and forming a magnificent porch to a corresponding interior. Turning from the tower to what remains of the former building, the font is first to be noticed, which is perhaps of the same date as the tower; it is octagonal in form, the bowl work into sunk panels and battlemented at the top. The four panels seen from the west have shields in them finished with coats-of-arms. The work has suffered somewhat from modern "improvement." Next is a fine brass to "Rafe Delvys and his wife," now fixed to the wall of the north aisle. It consists of figures of the knight and his lady, with the matrix of what appears to have been three children by the side of the lady, and two coats-of-arms, and the outline of two more. The inscription runs as follows:—"Here lyth Rafe Delvys of Doddington and Katernyn his wife the whyche Rafe died the third day Marche, in the yere of ower Lord God, A, mcccc. and xiv., on whose sowlyls Allmyghty Jhu have mercy." Lastly, there is on the north side of the chancel an elaborate alabaster canopied tomb within the sanctuary. It is a table tomb with effigies of Sir Thomas Smith and Dame Anne, his wife. In the front of the tomb are figures of the son and daughter, and beneath the canopy at the back the coat-of-arms and the following inscription:—"Here lieth Sir Thomas Smith, of Hough, Kt., and Dame Anne, his wife, daughter of Sir William Brereton, Kt., of Brereton, who had issue one son and one daughter, wch. Sr Thomas died the 21 of December, 1614, whose ladie in remembrance gave him



this monument." Both figures are for the most part in excellent preservation. The head of the knight rests on an elaborate crested helm: his hair is long and flowing, the face broad and full, with both beard and moustache: he is clothed in partial plate and armed with dagger and sword, and the feet rest on gloves or gauntlets. That of the lady is beautifully attired with ruff and very high stiff collar, and the dress is tucked up in a small roll immediately below the waist. The hands of both were uplifted, but are now wanting.

### ROYAL ARCHÆOLOGICAL INSTITUTE.

ON Tuesday the opening meeting of the Royal Archæological Institute of Great Britain and Ireland, now on a visit to Royal Leamington Spa, took place in the new Town Hall, Leamington. Amongst those present were Earl Percy (president of the Institute), Lord Leigh (president of the meeting), the Hon. Justice Pinkey, Major Lambitt, Mr. J. Brown, Q.C., Mr. T. H. Bayliss, Q.C., and a number of the local gentry, &c. Lord Percy, in formally opening the proceedings, expressed on behalf of the Institute the great thanks they felt to be due for the very kind reception the members had had on that occasion. They were looking forward to their stay in Warwickshire with feelings of very great interest. One of the principal features of these meetings was the opportunity afforded of constantly meeting with fresh and varied objects of interest. Last year they met in Wiltshire, where their attention was drawn to a totally different kind of archæology from what he supposed they would meet with in any other part of England. But, within the region of history, there was no part of England which bore more interesting traces of the great changes which had made England what she was like than the Midland Counties, and especially the county of Warwickshire. Here they could see the remains of the social life and political life of those who had contributed so largely to make England the great and flourishing country she was. As times of peace and war had gone over the country the struggles of the past had been marked by events with which Warwickshire and other places were closely connected. Therefore, all those who took an interest in history in its truest sense—the history which had made England what it was at present—would find on the present occasion ample objects to arrest their attention. In conclusion, Lord Percy referred to one or two subjects of congratulation and regret which attended this gathering. The subjects of congratulation were that they had had such a hearty reception, and had been able to secure so able a president as Lord Leigh. The matters for regret, the loss by death of four prominent and useful members, Mr. Morgan, Mr. Bloxam, Mr. Beresford-Hope, and Mr. Pullen. Those were four names which would always be held in affectionate remembrance.

Lord Leigh was then installed as president of the present meeting amid cheers. He mentioned that the Archæological Institute met at Warwick in 1864, on which occasion he had the honour, as now, of being the local president. He saw from the programme that they were about to pay a visit to Stratford-upon-Avon. Of late Warwickshire men had heard a great deal that had given them pain. He hoped the members of the Institute would not come away from Stratford and tell them that Shakespeare did not write the plays. His lordship then referred to the several excursions fixed for the week, mentioning the many objects of interest which would thus be brought under their notice, and expressed the great pleasure it would give him to welcome them to Stoneleigh.

### TESSERÆ.

#### Architecture at the Beginning of the Century.

T. L. DONALDSON.

IN the first quarter of the present century our art was at a very low ebb. The long and dreadful struggle with France had absorbed all the nation's resources. We had no spare money to bestow upon architecture, properly so called. The Government confined its expenditure to buildings required for the commonest purposes, raised in the most economical manner and with ordinary materials. The speculative builder superseded the accomplished architect, and erected, for the nobility and gentry, rows of square boxes of brick or stucco houses as mansions, without any pretension to effective decoration or dignified aspect. Shut out from intercourse with the Continental schools of art, there were not half a dozen men of superior qualifications among the professed architects of England. The Chambers and the Adams of the eighteenth century had passed away, and only a very weak tradition of the merits and taste of those great men remained. James Wyatt, Dance, Soane, the elder Hardwick, [and, not to omit Nash, were at the head of the profession. Sir Robert Smirke had but just entered the field, afterwards occupying a position so

distinguished and honourable to himself. The Grecian Wilkins had not yet made himself a name. Stuart's "Athens" was opening a new phase of art, and Britton and the oldest Pugin were reviving the interest in our Mediæval antiquities. But as for the literature of architecture, it was almost *nil* in England. Mr. Laing and Mr. Joseph Kaye, men of elegant taste and amiable disposition, but not of vigorous temperament, were pursuing a successful practice, but not with very striking distinction; for their productions, however graceful in detail, were not powerful in general effect. There was, therefore, wanting in the profession an energy of effort and strong purpose to carry out noble ideas of the highest class; in fact, it was rather suppressed than encouraged.

#### The Oldest Architectural Drawing.

W. BURGESS.

A plan of the Monastery of St. Gall is now preserved in the library of that establishment. It was first published by Keller, at Zurich, in 1844, and republished two-fifths the real size in the "Archæological Journal," p. 87, vol. v., with a most excellent notice by Professor Willis. The plan, which is drawn in thin red lines upon a large sheet of parchment, with inscriptions all over it, showing the uses of the different parts of the building, was sent, as one of the said inscriptions informs us, for the use of the Abbot Gospertus (who began to rebuild the church and monastery in 829), by some anonymous friend, who is supposed with some reason to have been Eginhard, the son-in-law of Charlemagne, who held the office of prefect of the royal buildings. However this may be, the plan presents us with a very complete monastery, with its great church and accompanying buildings. The red line not only serves to mark the external and party walls, but also to indicate the furniture, such as benches, tables, stoves, &c., requisite to each building. The plan, as Professor Willis very properly remarks, is not done to scale, but certain figured measurements enable us to form some idea of the size of the buildings. The church would appear to have been a most noble structure, with two apses and three paradises or semicircular walks. The western one was further enriched with two circular towers. The winding stairs of these latter are shown as gradually winding round from the circumference to the centre, like a section of a snail-shell. It is doubtful whether a common winding staircase is thus represented, or whether it was really an inclined plane, which went from the circumference to the centre, and so on to an upper chamber, where there was an altar, in the one case dedicated to St. Michael, and the other to St. Gabriel: there would, supposing the latter supposition to be correct, be room to hang the bells in the space between the newel and circumference in the upper part of the tower. The ornamental finial at the top is shown on plan as finishing the newel. The arches of the cloisters and the crosses of the altars are shown in elevation on their respective places on the plans, a mode which still obtains in Turkey at the present day, even among the distinguished native architects who have the honour of working for His Imperial Majesty the Sultan, so little have things changed in the East. Another peculiarity in this St. Gall plan is, that sundry squares are drawn in the middle of courtyards and of buildings. These, as Professor Willis suggests, might be either indications of the Classic atrium with its uncovered impluvium, or a sort of upper lantern rising above the roof and giving light by means of clerestory windows. Both these explanations are very feasible, and both probably were intended in the original. Lastly, Eginhard, or whoever was the architect, wrote certain explanations in Latin verses on various parts of the drawing. Fancy that most matter-of-fact production, a modern plan, ornamented with metrical directions to the builder!

#### The Sarcophagi in the Arles Museum.

J. B. WARING.

Very important and interesting series of sarcophagi are preserved in the Museum at Arles; dates are unfortunately wanting, and the names, which are Roman, though the persons were probably Gauls, afford no aid; they may, however, be generally assigned to between the third and sixth centuries: they are of the usual Roman sarcophagus type, carved with subjects from the Old and New Testaments. Those most in vogue were the Saviour and the Apostles, sometimes in a continuous row, sometimes separated by columns. Once here, and once at Narbonne, we find trees instead of columns, very tastefully arranged, with birds in the foliage; the trees are apparently olive, the birds are doves. The miracles of the Saviour are also shown: these also are sometimes continuous, sometimes divided by colonnettes: in the centre is usually a female figure with hands outstretched—intended, no doubt, for the Virgin Mary. From the Old Testament we have mostly Moses striking the Rock, Pharaoh in the Red Sea, Daniel in the Lions' Den, and the Sacrifice of Isaac. The tomb of the Labarum is carved with the Twelve Apostles without divisions, a line of cloud passes behind their heads with stars, and over each head a lion's paw holds a wreath or crown: in the centre is a large wreath containing the monogram of the Saviour



resting on a cross, with two doves; two soldiers kneel at the foot of the cross, one on each side: over the Apostles are two genii or angels supporting circular medallions containing a male and female bust, and again two genii holding an oblong tablet without an inscription. Each angle terminates in a large mask, the facial line forming the angle. On one end is St. John baptising, and on the other Moses striking the rock. This tomb is known locally as that of Constantine; it not improbably belonged to his family, and we may conclude it to be a work of the second half of the fourth century. Sculpture is here seen founded on a good model, but somewhat rough of execution and heavy in proportion; the faces are singularly *à l'antique*; some of the Apostles are also of the Jewish cast of the best kind. No nimbi occur in these, or in any other example (except a very rough and unimportant one) in the collection. The dress consists of tunic and sandals; all the eyes have holes in the pupils, and generally also at the angle of the nose, to give expression. The whole character is strongly marked Roman; and though the heads are large, the hands clumsy, and the style conventional, yet there is a certain simplicity and nobleness about them by no means to be despised; some few of the heads are indeed first-rate, exhibiting such peculiarities as to lead one to conclude they are portraits. At any rate, we find here a school of sculpture at an early Christian period—the best, I should say, then existing, and which ranks much above the stupid faces and lanky figures, the streaky hair and stiff drapery, the minute folds and jewelled borders, of sculptured art in the same district, which reached its bathos in the twelfth century.

#### Chryselephantine Statues.

JOHN BELL.

There were many ancient Greek statues that at any rate were not monochrome, but of various colours, and in many cases, I believe, painted up to full tints. These, however, were not, I conceive, usually in marble, but their chief examples come under the head of the chryselephantine art of the Greeks used in the temples. These Greeks, like the Egyptians, made gigantic statues of their gods—Jupiter, Juno, Minerva, Apollo, &c.—not, however, in granite, but sometimes in marble. Usually, however, these very large figures were made in metal, either cast or beaten work, or in ivory and gold, that is, with a surface of thin veneers of ivory and plates of gold laid over a framework of wood, so fashioned as just to allow their thickness to make up the substance, form, and surface required. This seems, no doubt, a strange patchwork way of making up a god, like a piece of upholstery, and vastly inferior in dignity to hewing him out of granite or marble, and, indeed, had we not reliable data for the practice, we could hardly have believed that such a people as the Greeks would have so wrought. First, I would premise that these chryselephantine, or gold and ivory statues, were not uncommon in Greece and the Grecian islands—indeed, that it was a received way of making a god in those days, and that, moreover, they were not unfrequently of great size. The *Jupiter* of Elis, although seated, was 60 feet high, and the *Minerva* of the Parthenon, standing, 40 feet. Both of these were by Phidias. Among various other large examples of this art were the *Juno* of Argos, by Polyclethus; the *Æsculapius* at Epidaurus, by Thrasymedes; and the *Great Goddesses* at Megalopolis, by Damaphoon. The first thing to be done in making these giant works, after the model was prepared, was to put together a great framework of wood as a core, yet hollow within so that the workmen could get inside to adjust the work and rivet the veneers of ivory and gold which were to form the surface, and no doubt for convenience they had stages and staircases within these great statues, the wooden framework of which was, as Müller informs us, strengthened across with rods of metal. But he shall speak for himself. In division 312 of his elaborate work on ancient art, this author thus informs us:—"The ancients received from India, but especially from Africa, elephants' teeth of considerable size, by the splitting and bending of which, 'a lost art,' but one which certainly existed in antiquity, they could obtain plates of ivory from 12 to 20 inches in breadth." I may here be allowed to remark that in the Exhibition of 1851 this "lost art," so called by Müller, seems to have been revived, and carried even further than by the Greeks. A prize medal was awarded on that occasion to Messrs. J. Pratt & Co., Meridan, Connecticut, United States, for specimens of ivory veneers cut by machinery. "These veneers were exceedingly delicate"—I am quoting the official report—"one piece alone being 12 inches in breadth and 40 feet in length, and having been sawn from a single tusk." But to return to these great Greek statues. "In executing one of these," says Müller, "after the surface of the model was distributed in such a way as could best be reproduced in these plates, the individual portions were accurately represented by sawing, planing, and filing the ivory, and afterwards joined together, especially by the use of isinglass, over a kernel of wood and metal rods. The holding together, however," he adds, "of the pieces required incessant care"; as, indeed, we may well conceive, as

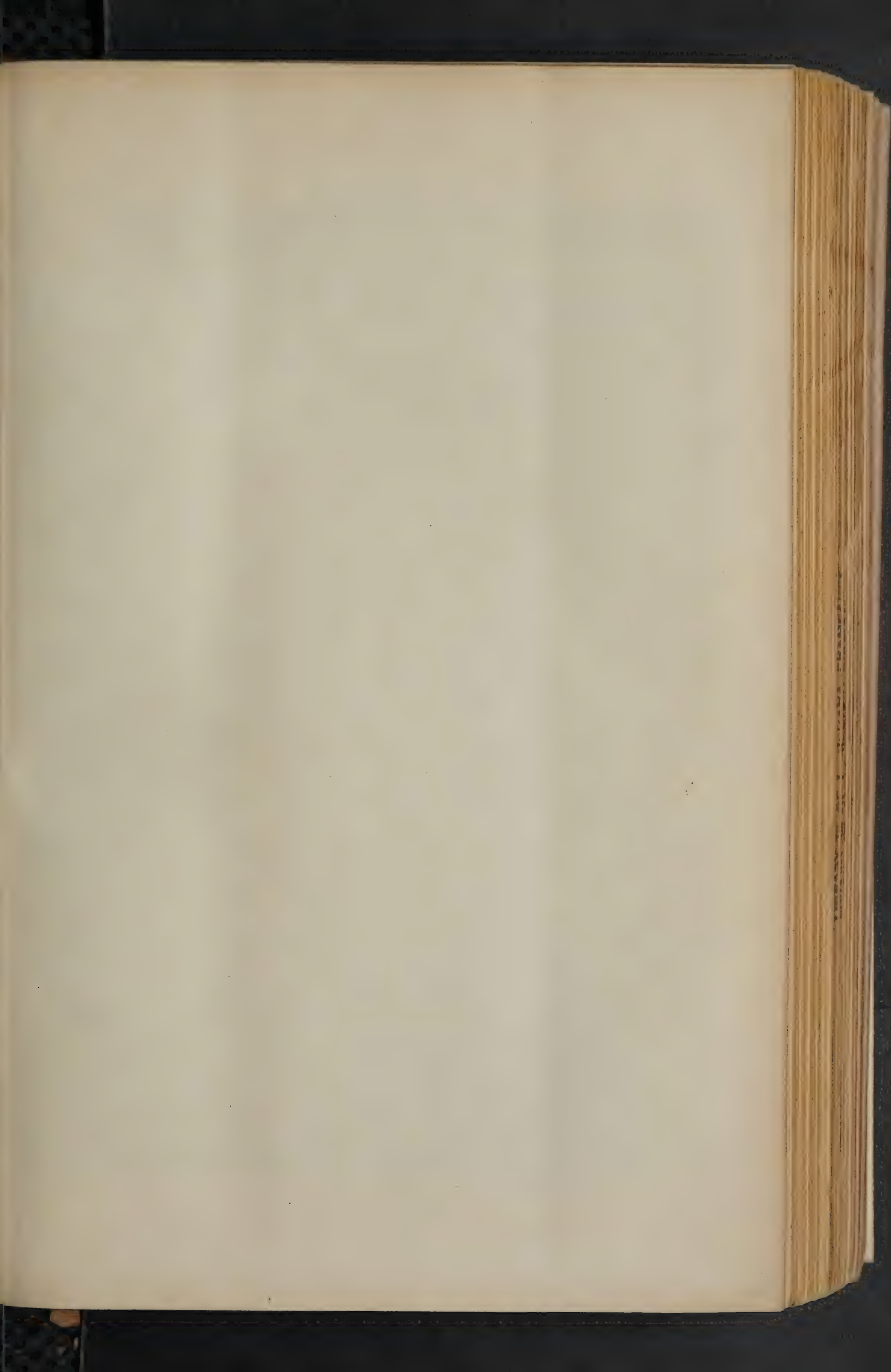
ivory is apt to expand and contract, and warp and curl, in changes of moisture and temperature. Indeed, it must be acknowledged that the whole process and sham nature of the work thus described impresses us with want of dignity, lack of permanence, and the necessity of repair. From a passage in Valerius Maximus, it appears that Phidias desired to make the figure of *Minerva* for the Parthenon, not after this fashion, but in marble; he was, however, overruled. Had the sculptor had his way, we should probably have had now existing some grand and noble remains of it, in addition to those invaluable fragments of some of the subordinate statues which we possess in the British Museum.

#### Crushing of Masonry.

E. NASH.

Crushing of material is a subject that necessarily comes under the architect's observation. In 1848 the columns of a new church were formed of chalk; this was, of course, the grey chalk, which is a sound homogeneous material and if kept dry will sustain a good weight, but in this case wet got to it and some front, and it went to pieces. It seems to me that when we look at the adverse conditions to which building operations are exposed, it is scarcely wise to use so absorbent and so light a material for bearing purposes. Some kinds of chalk are not unfit for other uses in a building, and a good application of it for ornamental work may be seen in the restoration of St. Cross Church, at Winchester. In the case of a Bath stone column in a modern building, from which sprang four arches, it failed from crushing, or rather it was from breakage. The shaft was a cylinder of 2 feet 3 inches in diameter upon a base 3 feet 3 inches square, and it was the moulded base stone that broke. The weight on the column was about 68 tons, that being 17 tons per square foot, which is less than one-third of the smallest weight that is sufficient for crushing according to experiments, which have shown that it takes at least 54 tons per square foot to crush good Bath stone. The discovery of the failure was made soon after the building had been roofed in, and all was in very perilous condition, inasmuch as if this shaft had come down nearly the whole building would have followed. The stone that broke was the one used at the ceremony of what is called laying the first stone. It was 1 foot 6 inches thick, and 3 feet 3 inches square, and in the centre of the stone beneath it was a small hollow for a bottle of coins, so that there was no bearing in the immediate heart of the work; but the failure was not caused by this, but by the improper manner in which the stone was bedded by a noble personage, or rather I should say by the masons who prepared the bedding for his lordship. The foreman thought he must have the mortar peculiarly smooth and good-looking, which was an error to begin with; he then put four stout patches of it on the lower stone, one near each of the four corners, where it got somewhat dry during the time consumed by the ceremonial; and after that time some fine liquid mortar, very much like grout, was put over the general surface, and his lordship trowelled it about, but the four patches were not flattened down nor made homogeneous with the other mortar, yet the stone was then lowered, leaving the four patches as the most solid portions. All stood well for nearly a twelvemonth, until the entire weight came on, and then cracks were observed. There is abundant evidence in both ancient and modern works of the defective mode in which the materials of walls are put together, and though this may be of comparatively slight importance when the walls have not much duty beyond that of being the enclosures of buildings, yet when they have to sustain great weights or thrusts it becomes of paramount importance that their materials be well applied and united, and this fact seems scarcely to have been fully appreciated since the best days of the Greeks and Romans. The crushing of the piers carrying the dome of the Pantheon at Paris is a most instructive warning under this head, and, while deploring the occurrence, we cannot but admire the remarkable mechanical talent displayed by Rondelet in the restoration of them, and the book that was published on the subject is well worthy of study, but the chief defect that I wish to allude to is the absence of that uniformity in the horizontal strata of walls which the word "homogeneous" most expressively indicates, and of which defect the tambour wall under the dome of St. Peter at Rome is a notable example. In a rapid age like the present it is not likely that this homogeneity or similarity of material through the whole thickness of the wall will be thoroughly attended to. I will note a small matter that is slightly connected with the point, namely, that in buildings even of considerable excellence the water tables of buttresses often break away from the body of the buttress, especially when the bulk of the work is of rough stone; this irregular settlement shows that the dressed stone, being more compactly laid than the rough stone, the two do not harmoniously blend, and that a more thorough bonding is needful, by using longer alternate stones that is customary, and it also suggests the idea that buttresses may have too great a projection, inasmuch as the outer part may not catch the due influence of the weight.







The Architect, Aug. 10<sup>th</sup> 1888.

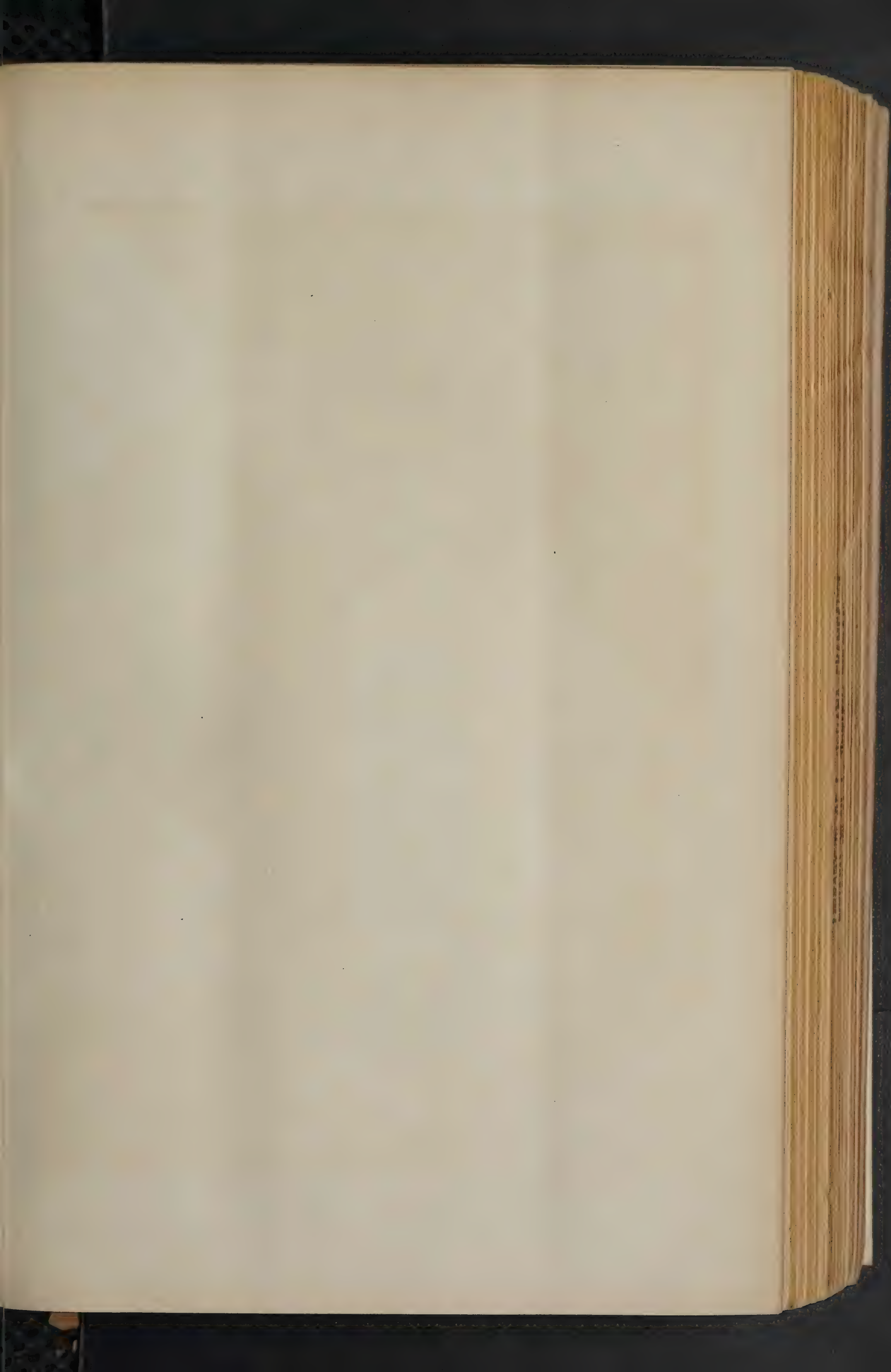


Frank T. Verity

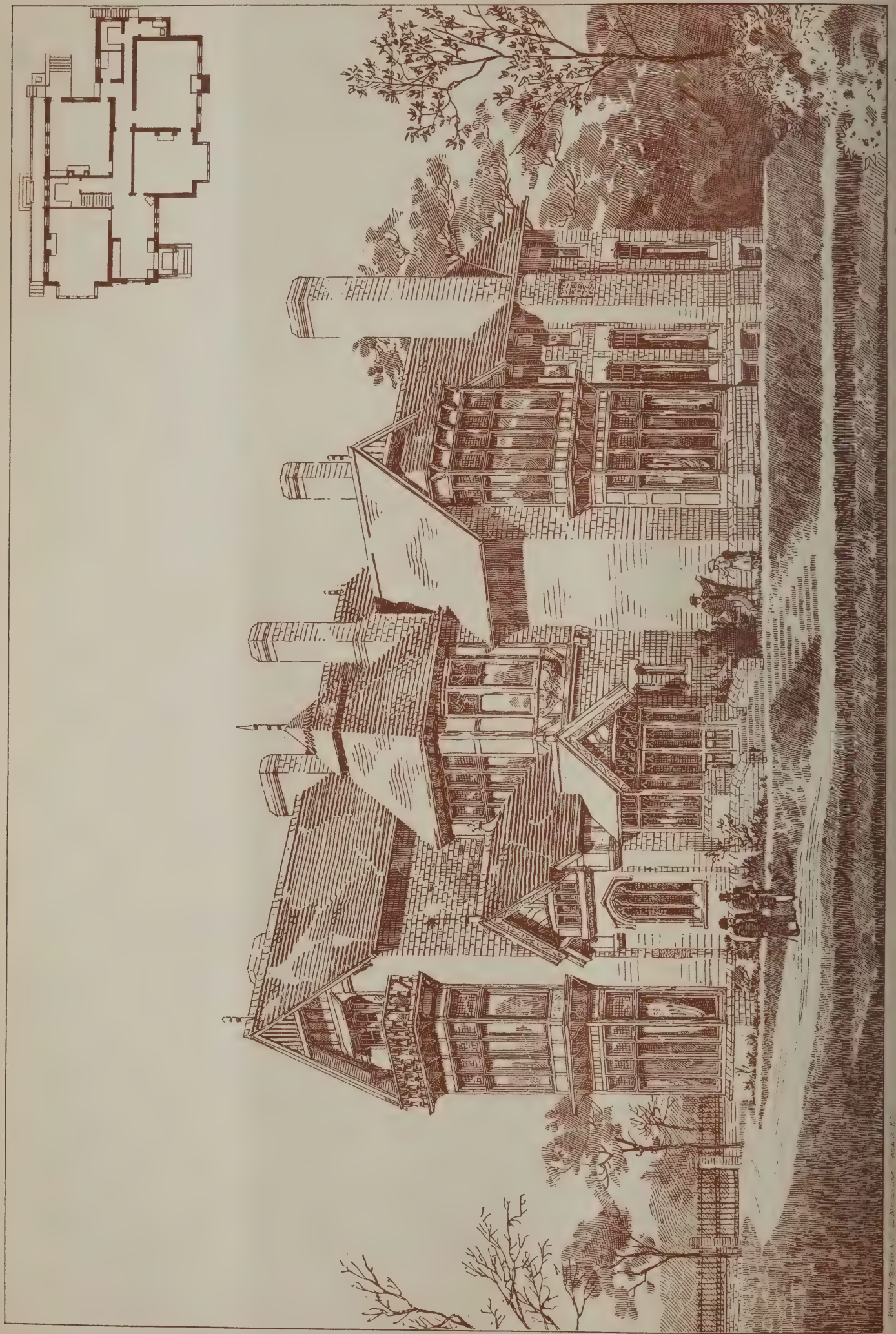
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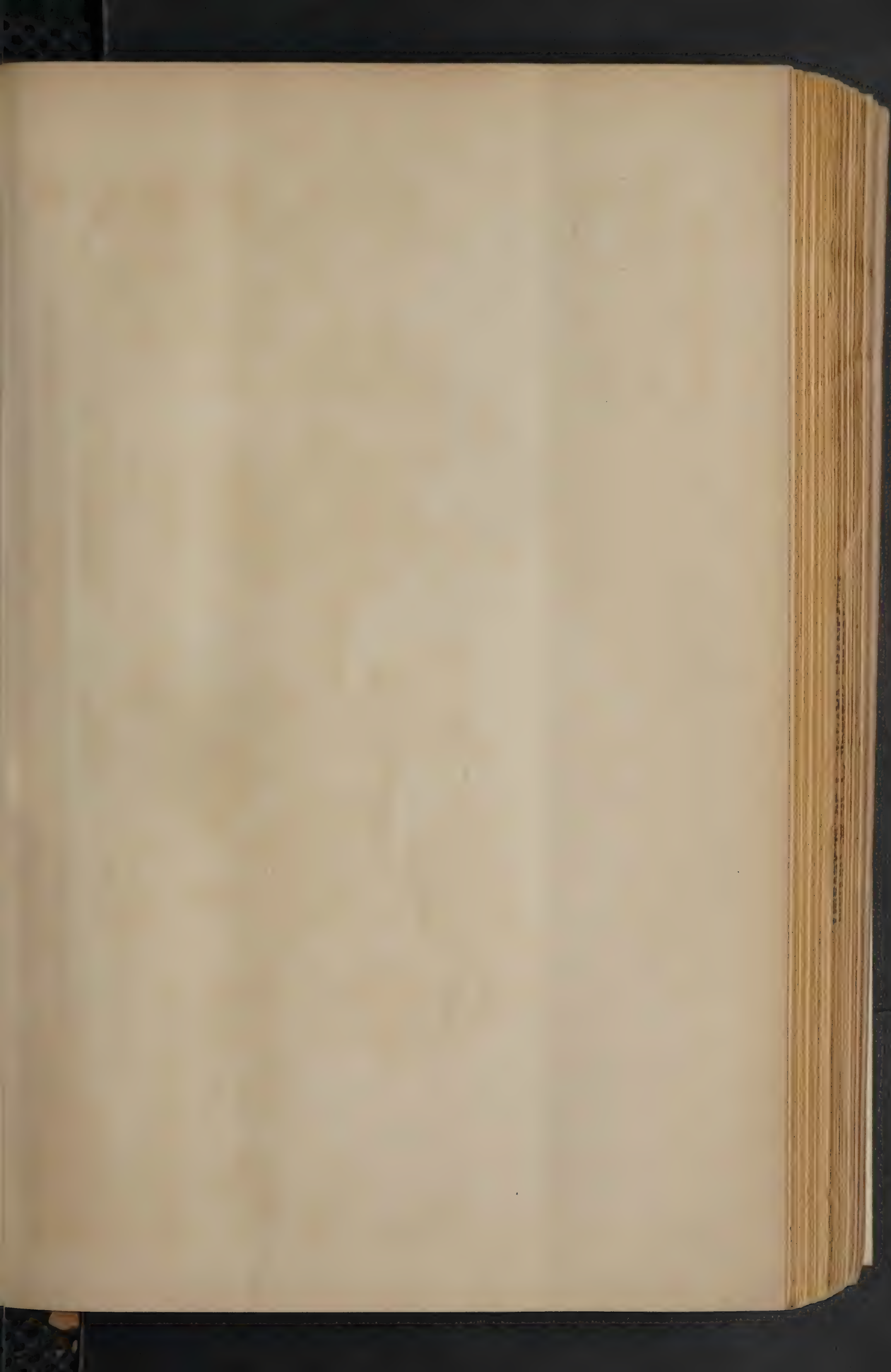




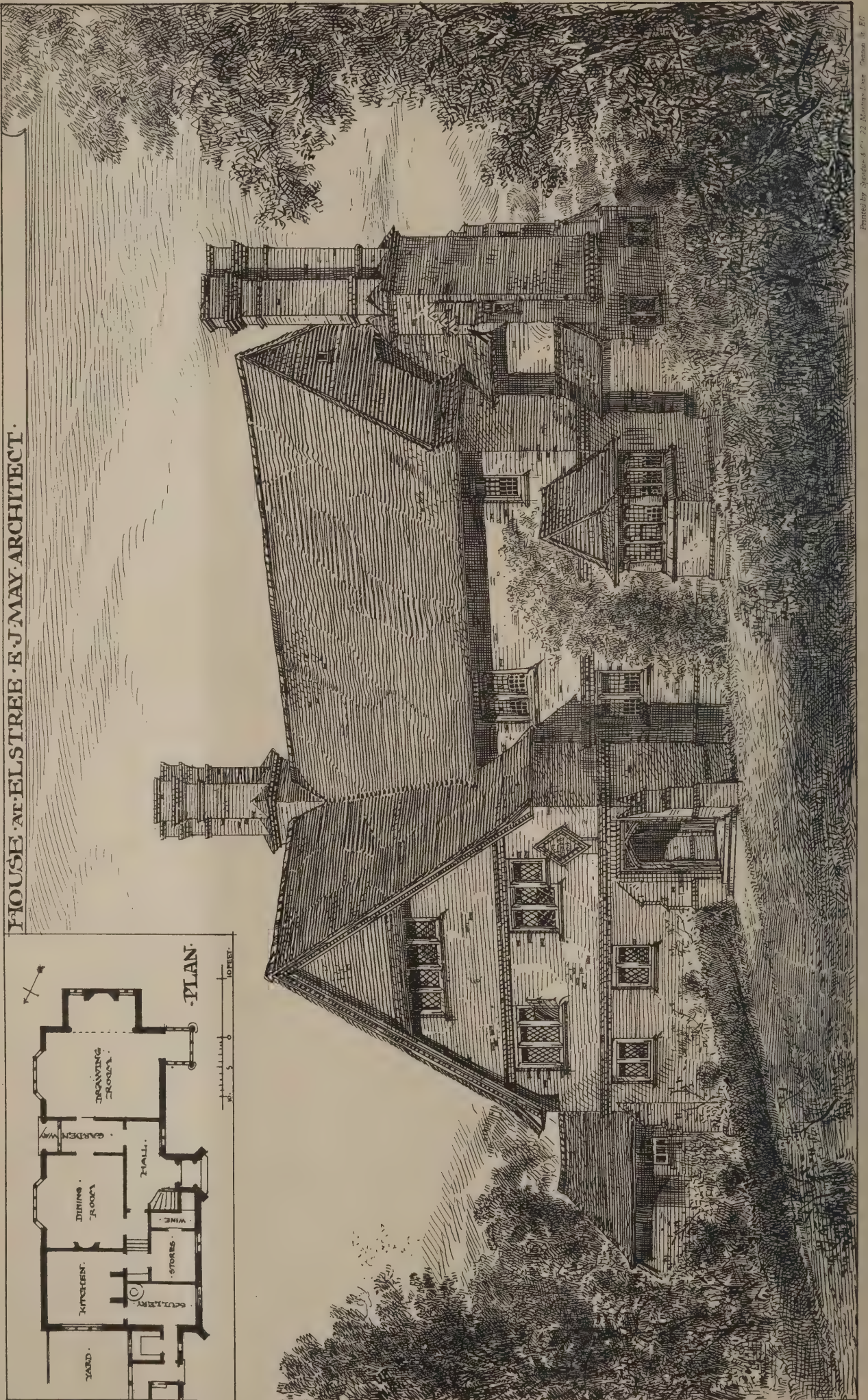










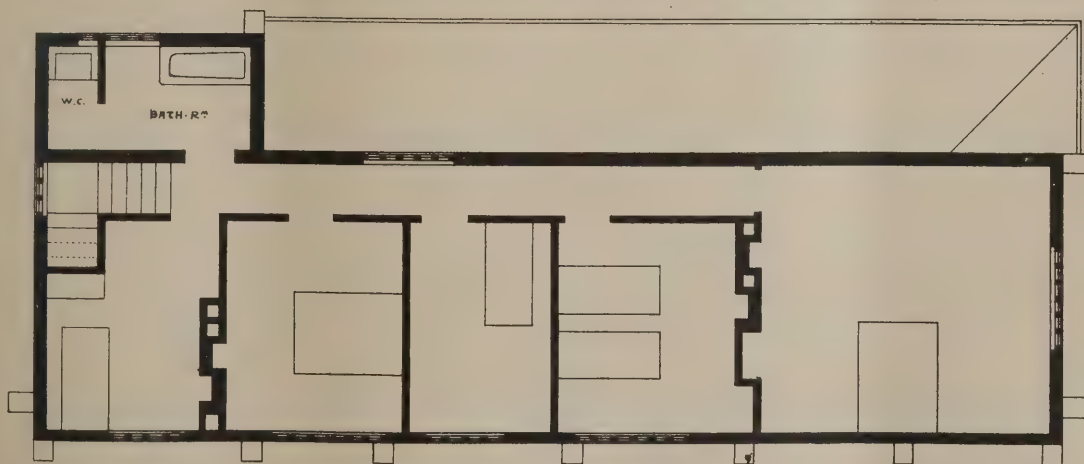
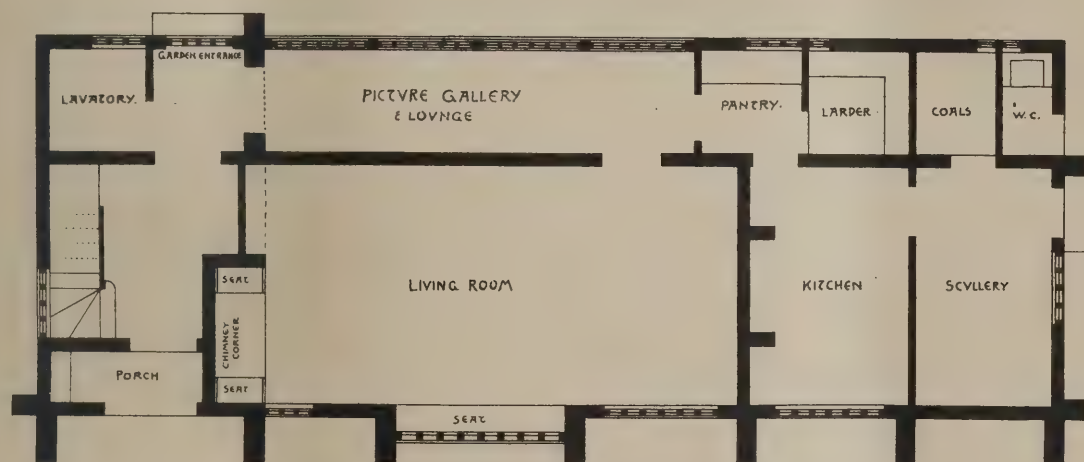




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COTTAGE FOR C. F. A. VOYSEY ARCHITECT.

1/4 SCALE



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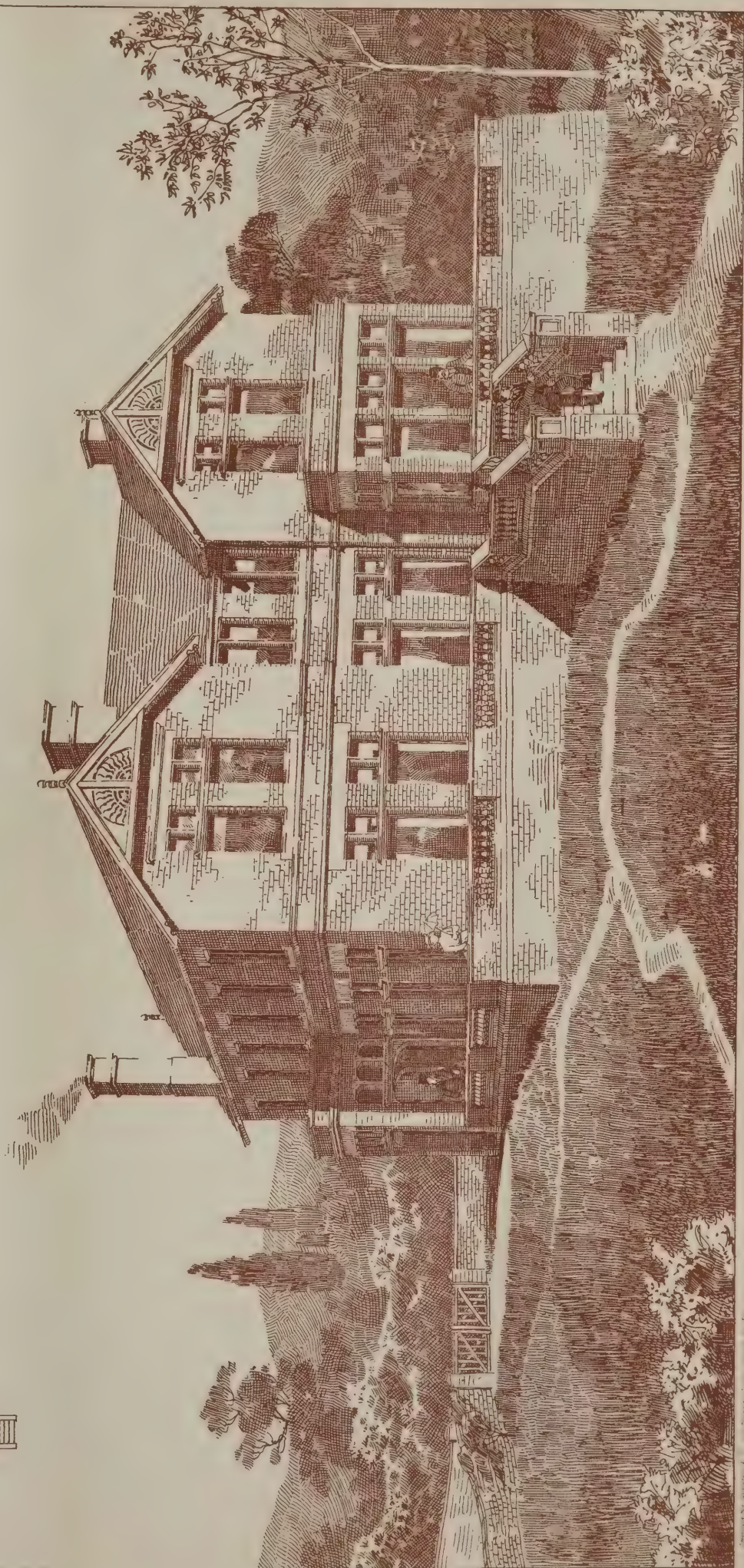
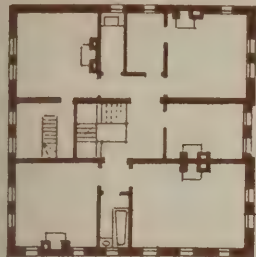
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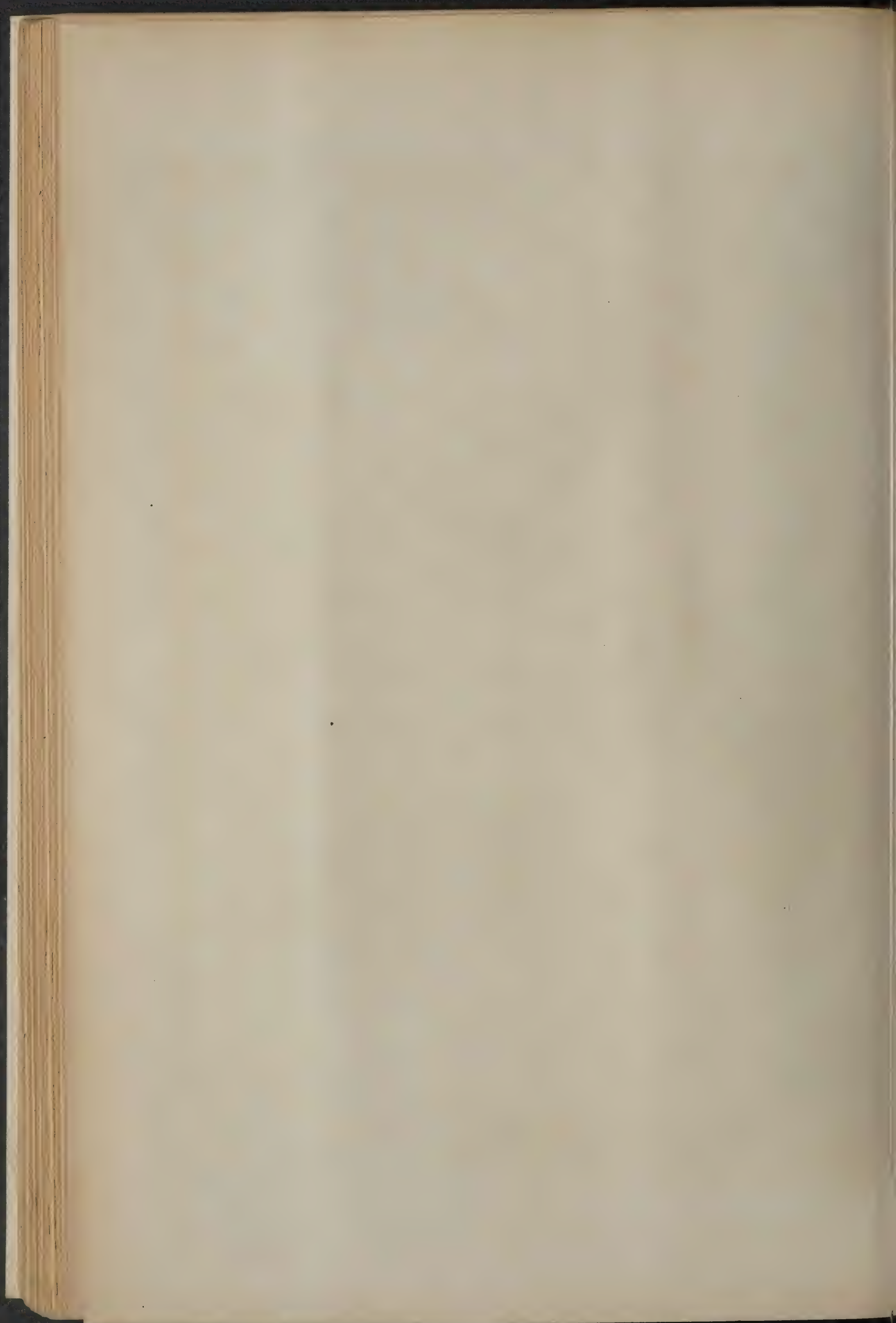


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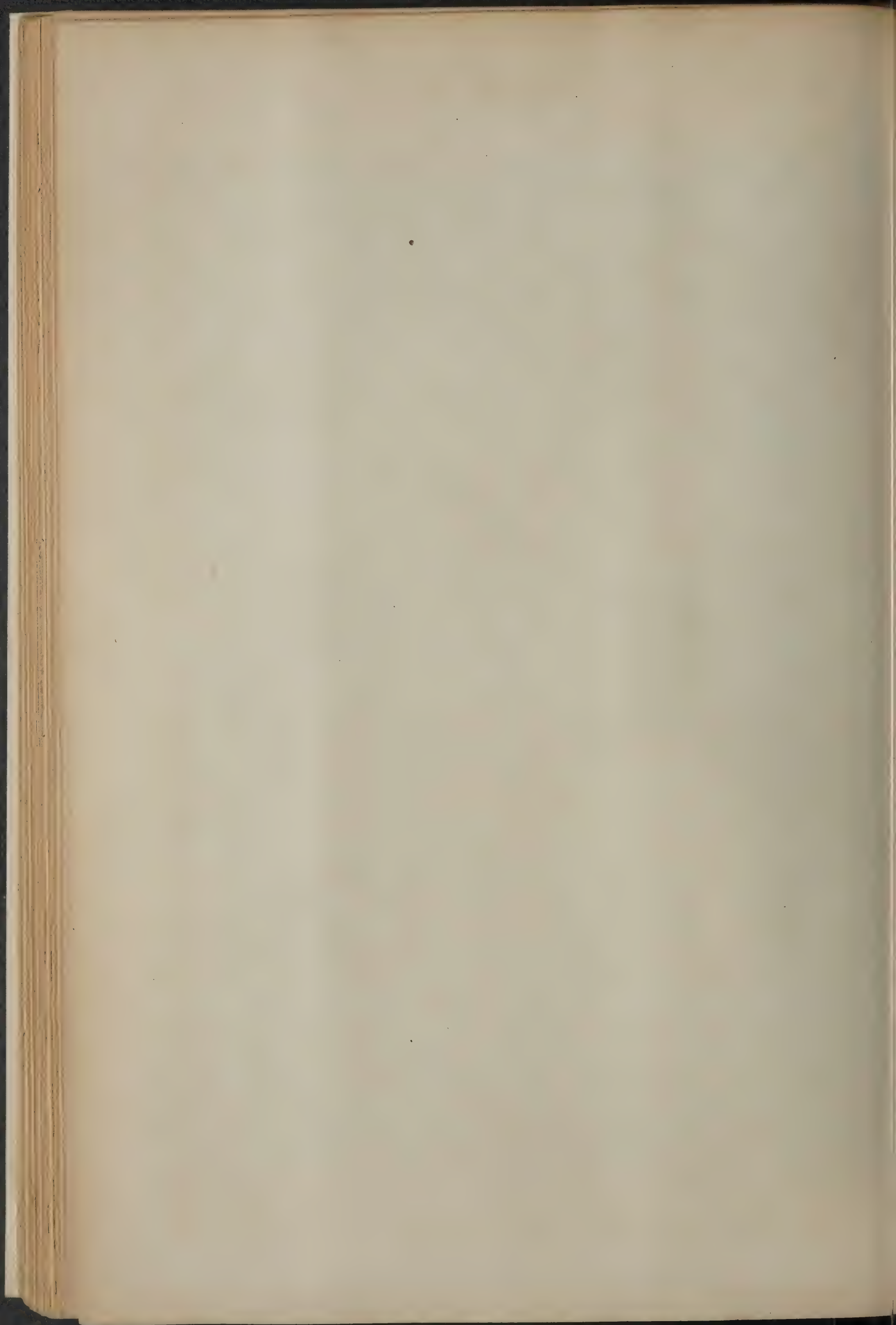
The Architect. Aug<sup>10</sup> 1888.



HEIDELBERG CASTLE,  
THE FRIEDRICHS BAU.  
B. FRANK T. VERITY.

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## ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 10.—HOUSE AT ELSTREE. [E. J. MAY.]

NO. 11.—COTTAGE. [C. F. A. VOYSEY.]

## WOODBOURNE.

ROUNDHAY Park was purchased by the Leeds Corporation about sixteen years ago, at a cost of 135,000*l*. Woodbourne was built a few years ago on one of the sites sold by the Corporation after they had reserved sufficient of the original estate of 800 acres to serve their purpose for a recreation-ground. The house is built on well-wooded rising ground above the Waterloo Lake. The porch and wing to the right are recent additions. The new dining-room in the wing is fitted up with a brown oak dado 3 feet 6 inches high, and an elaborately-panelled and moulded ceiling also in brown oak. Messrs. S. E. SMITH & J. TWEEDALE, of Leeds, are the architects.

## HOUSE, POOL BANK.

THIS house, also designed by Messrs. SMITH & TWEEDALE, is being erected on a site embracing one of the most beautiful views in Wharfedale (one of the favourite resorts of TURNER). The terrace commands views of Ormescliffe Crag, Ilkley, and Arthington. The whole of the walling is carried out in tooled local sandstone. The three sitting-rooms have oak dados. The main staircase will be carried out in oak, walnut, teak and mahogany.

## THE OTTO HEINRICHS BAU, HEIDELBERG CASTLE.

## THE FRIEDRICHS BAU, HEIDELBERG CASTLE.

## PICTURES BY OLD MASTERS.

A GIFT has just been made to the National Gallery by Sir John Savile, G.C.B., late Ambassador in Rome, of a small sketch by Murillo, three pictures of still-life of the highest quality, and fifty-nine small copies in oil-colour of pictures by Velasquez at Madrid. Arrangements are being made for these last to be hung in a room on the ground floor, where they will as soon as possible be exhibited to the public. The other pictures will be hung upstairs as soon as they have been placed under glass. The Murillo is a very beautiful sketch by the master for his large picture of *The Birth of the Virgin*, now in the Louvre; and, like many of the sketches of Murillo, is so light in touch, so exquisite in colour, as to be, from an artistic point of view, preferable to the finished picture. The other three are (1) a small canvas with lemons and a glass, painted with extraordinary brilliancy, and signed "Jan van de Velde," a very rare master, probably the uncle of the well-known painter of ships; (2) a small panel picture of various still-life objects, including a Japanese sword, signed "H. Steenwyck," also a very rare painter, and not to be confused with the painter of church interiors; (3) a picture with a loaf of bread and a bottle, signed "Chardin, 1773." This will be a welcome addition to the very scanty collection of French pictures. In quality it is as fine as any of the Chardins in the Louvre. All the pictures are in the most excellent condition.

## NATIONAL PORTRAIT GALLERY.

THE 31st annual report of the trustees of this Gallery has just been issued. They deplore the death during the past year of their valued colleague, Mr. Beresford-Hope, M.P., who was for twenty-one years a member of the Trust. To supply the vacancy thus caused at the Board, as well as that caused by the withdrawal of the Bishop of Chester, a Treasury minute had appointed trustees the Earl of Pembroke and the Speaker. In the previous report the purchases were stated to amount to 417; they may now be continued to 420, and include portraits of Lieut.-General Sir James Hope Grant, 1806-1875, by Sir Francis Grant, P.R.A.; Mrs. Sarah Trimmer, 1741-1810, educational writer, painted by Henry Howard, R.A.; and Admiral Sir Cloudesley Shovel, 1650-1707, painted by Michael Dahl. An important alteration of name in one of the principal pictures has recently been made. A portrait formerly in

the possession of Mr. Fraser Tytler, and described as a portrait of Mary Queen of Scots, has been found to be a portrait of her mother, Mary of Lorraine. The manner in which the arms of France and Scotland are quartered clearly indicate the date, 1560, when Francis II. and Mary ruled in France, and Mary of Lorraine was Regent of Scotland. The picture would appear to have been painted whilst the Regent was besieged in Leith, and the distant city and castle among rocks would be intended for Edinburgh. Another picture, presented in May 1877, as a portrait of Sir Randolph Crewe, has since been proved to represent Sir John Bramston, an eminent judge, painted by Daniel Mytens. Several pictures have been cleaned and lined, others have been cleaned, and seven portraits have been put under glass. The number of visitors to the gallery from the commencement in Great George Street, Westminster, in 1859, to September 1885 (when the pictures were removed to Bethnal Green), was 1,493,365.

## PUBLIC BUILDINGS FOR OLDBURY.

AT the monthly meeting of the Oldbury Local Board, a resolution was brought forward by the chairman, Mr. A. Thompson, that it was desirable the Board should take the necessary steps to provide public buildings for the district of Oldbury, which would include a free library, and that the matter be referred to a committee, consisting of the whole Board, to consider and report thereon as to the cost. He remarked that there was no question as to the desirability of public buildings for the town. He had had some plans prepared on his own responsibility in connection with a site he had in view. He thought that Oldbury could now very well afford the expense which would be incurred in erecting public buildings. The site was one which faced the old churchyard and Freeth Street, and that could be purchased for something under 2,000*l*. He estimated that the buildings could be erected for about 2,000*l*, making the total estimated expenditure 4,000*l*, and he did not think it would increase the present rates, because the rateable value of Oldbury was advancing, and the increase in that direction would nearly make up the amount required for repaying the principal and interest. Ultimately the resolution was carried, with one dissident.

## PERMANENCY OF WATER-COLOURS.

THE first report in the experimental investigation of the effect of light on water-colours, in its scientific bearings, by Dr. W. J. Russell, F.R.S., and Captain Abney, R.E., F.R.S., has been issued. A representative committee of artists, appointed to consider the question from the art point of view, have accepted the first report now presented to Parliament, and have acknowledged the thoroughness and ability with which the investigation has been conducted. The committee consisted of Sir F. Leighton, Bart., P.R.A. (chairman), Mr. L. Alma Tadema, R.A., Mr. T. Armstrong, Mr. Sidney Colvin, Mr. Frank Dillon, Mr. Carl Haag, Sir James D. Linton, Mr. E. J. Poynter, R.A., Mr. Henry Wallis, and Mr. Arthur Torrens (secretary).

This committee held four meetings, and Dr. Russell and Captain Abney had numerous communications with individual members, from whom they received valuable information on the subject of their inquiry.

The report now presented deals with the physical effects of light on water-colours. It states that the subject divides itself into at least three parts. First, the nature of the optical changes; second, the character of the chemical changes; and third, the causes which initiate and accelerate these changes. Owing to the time required to carry out such an investigation the report had to be divided into two sections, the first of which is now published.

Some preliminary remarks are made on the optical property of pigments and the different character of lights to which they may be exposed. The following extracts must serve to indicate the lines on which the investigation proceeded:—

Colours, the report states, are popularly talked of as greens, blues, reds, &c., and to these distinctive appellations are added by artists. Thus they talk of emerald green, cobalt blue, Venetian red, &c. Though to some extent to the trained eye an idea is thus given of the hue and luminosity of the colour, yet to the scientific experimentalist the definitions of colours require supplementing, and in estimating any change which may take place in them an exact quantitative value of each is a desideratum. As to why a pigment is coloured, science has hitherto not furnished a satisfactory answer; nor for the inquiry which we have undertaken is it at all necessary that an answer should be given. The question, however, as to how a pigment produces the impression of colour, is one which can be answered. Colour is due to the selective action of the pigment, or stain, on light. That is to say, the rays of certain



wave lengths, or colours, are transmitted and reflected by each pigment, or stain, in a more or less perfect manner, and the others are absorbed. The transmitted and reflected rays will be shown to be identical—except in certain cases which it is unnecessary to consider here—and it is to these that the colour of the pigment is due.

If we decompose a thin slice of white light into its component colours by means of a prism we get what is known as the spectrum, and if we allow this variegated band to fall on a white surface, such as white card or a surface of zinc oxide or barium sulphate, that surface becomes luminous where the colours fall, and they are presented to the eye with the greatest brilliancy possible. If, however, for the white surface we substitute a surface covered with some coloured pigment we at once perceive a difference. That which is generally supposed to be the colour of the pigment is lost, and we have a stripe of the surface illuminated with the different rays of the spectrum, but their different colours are presented to the eye with their brilliancy unequally reduced. Probably no one coloured ray is reflected with the same brilliancy as it was from the white surface, and a large part of the spectrum is very much dimmed. In other words, the pigment does not reflect any component of white light with the same intensity as does the white surface. If by proper means we collect the different coloured rays of the spectrum reflected from the coloured surface, and recombine them, we get back again the colour of pigment. If we measure the brightness of each colour reflected from the pigment in terms of the brightness of the same colours reflected from white paper, we have a quantitative measure of the light reflected from the pigment, such light being that by which the pigment produces the impression of colour. Thus, if we measure the light reflected from cobalt blue in the various parts of the spectrum, we may produce the colour of cobalt on white paper by reducing in proper proportions the different rays of the spectrum formed by white light, and then recombining them. The colour of a pigment, we may say, is dependent on the amount of the components of white light which it reflects back to the eye.

Further, it will be seen that no matter what the source of light may be—whether the yellowish-white light of gas, the purer white of the electric arc light, or of the sun, or the bluer white light from the sky—the comparative measures of the brightnesses of the different colours reflected from the two surfaces will always be the same. Thus, if the spectrum formed by gaslight be used, and the brightnesses of the different parts of the spectrum reflected from a white surface and from a coloured surface be compared, the comparative values of the different rays thus obtained will be the same as if the source of light had been the sun. To see what will be the colour of a pigment by gaslight, the rays of the spectrum of gaslight must be reduced in the proper proportion found for the particular pigment, and be again recombined, and this will give the colour of the pigment seen by gaslight. In the same way, if the spectrum be formed by sunlight, the different parts of that spectrum must be reduced in exactly the same proportion, and the recombined spectrum will give the colour of the pigment as it would be seen in sunlight. Careful measurements of the various simple and mixed water-colours which are usually employed by artists have been made and are given in another part of the report. The source of light employed was the electric arc light, and the relative intensities of the different coloured rays were measured by a method which was described in a paper recently read before the Royal Society.

In tracing the sequence of phenomena which happen when white light falls on a coloured surface, it is stated that colours may be divided into two classes, those which are insoluble and those which are soluble in water. Many of the soluble colouring matters are precipitated as lakes, and the same arguments hold good for these as for the solid pigments. In the case of an insoluble pigment a ray of white light falls on one of the particles, but only some components of the light can pass through it, and it emerges after its passage as coloured. This strikes the next particle, and part is reflected back, reaching the eye as coloured light, but part penetrates through the next particle. This in its turn is partly reflected back and partly transmitted, and so on. At the same time, however, a certain amount of white light is reflected from the surface of the particles, and mixes with the coloured light, which has passed through one or more particles. Hence the colour of a pigment always contains a certain percentage of white light, together with the coloured light. Thus the colour of Prussian blue is principally due to the transmission through the particles of a large proportion of the violet blue and blue-green rays, together with a small quantity of white light reflected from the surface of the particles to which the original light falling on it had direct access. It may be remarked that when thin washes of these colours are washed over white paper the number of coloured particles are comparatively few, and that the white paper reflects relatively more white light to the eye. A microscopic examination of such a surface reveals this fact in a

very interesting manner. The colour is, therefore, less intense in hue, and whiter. The nearest approach to the real colour of a water-colour pigment is seen when a mass of the moist colour is on the palette, the white light reflected being then at its minimum. The same argument applies to those colours which are soluble and which, consequently, we may take to be continuous. The light which penetrates such a colour will be of the same hue as that reflected to the eye from the paper. The white light passes through the stain, loses certain portions of the original spectrum colours, is reflected from the white paper beneath, and is once more transmitted through the colour, reaching the eye as a coloured light. Thus the colour of the carmine (cochineal) is due to the transmission by the dye of most of the red and a good deal of the blue of the spectrum of white light. The effect of mixing a white with a coloured pigment is to cause more white light to be reflected, and thus to give a pale and less transparent appearance to the colour.

A comparison is then instituted as to the light reflected from colours with that transmitted from them, and it is stated that in the Prussian blue the reflected and transmitted light are very nearly identical, but in the carmine the transmitted light was less than the reflected. The small difference in the first case and the larger difference in the second is due to the fact that the depth of colour in the reflected and transmitted lights was not equal.

Of the effects of absorption, the report says it is a received axiom in physical science that in any body which absorbs radiation, the energy so disappearing performs work of some kind in that body. The work so done is a raising the temperature of the body, a chemical decomposition of the body, or a rearrangement of its molecular condition, as for instance in the iodide of mercury. Each kind of work may be done at the same time, but the energy which is expended on one form cannot be again expended on another form of work. On elements such as carbon, gold, &c., the work done only raises the temperature of the body above that of the surrounding objects, but in chemical compounds, such as nearly all the pigments in use are, there may be besides a chemical decomposition. The chemical decomposition of a colour means a fading or an alteration in its colour, but the raising of its temperature to the small degree which the visible (light), or invisible, radiation to which it is ordinarily exposed can effect, does not alter its composition or colour. That the temperature above that of the surrounding objects to which a colour can be raised, even by sunlight, when freely exposed, is small, is not only shown by theoretical reasoning, but by direct experiment. In the case of a wash of water-colour, the particles on which the radiation falls are very small, and they consequently have a large surface compared with their volume. As the rapidity of loss of temperature in equal volumes under the same conditions is in the ratio of the radiating area, it follows that the loss of temperature by radiation in the small mass is very nearly equal to its gain. In other words there is an equilibrium of temperature established which is but very little higher than the temperature of surrounding objects. When chemical decomposition takes place by light, however, the results are different. The decomposition once effected remains, and the quantity of the matter decomposed increases with the length of exposure. The outside of the particles is first acted upon, and then gradually (as light continues to act) the inner portions are decomposed, until finally the whole particle is changed. Evidently those colours, the effect of light on which is to bleach them, are the most rapidly acted upon. Again, too, the large area of the surface of particles, as in a water-colour, compared with their small volume, is favourable for the rapid effect of the action of light in altering their composition.

As work depends upon absorption, it is important to remember that when the radiation (light) is decomposed into its prismatic components, it is only those rays of the spectrum which are absorbed that can do this work. Thus, if a pigment only absorbs in the red, it is only the red rays which can do work and no others, and so on.

Chemical action in bodies and the action of "light" waves on atoms and molecules are dealt with. As to the light to which pigments in water-colour drawings are ordinarily exposed in a room, it is stated that there is no doubt that pictures are, as a rule, carefully protected from direct sunlight, but it is nevertheless true that the greater portion of the light they receive is reflected sunlight. On a bright day clouds reflect sunlight, and on a dull day the principal part of the diffused light is also sunlight which is reflected according to the laws of geometrical optics from particle to particle, a certain percentage eventually reaching the earth through the clouds. There is, of course, also a fair proportion of the light due to the sky, and this light is bluer than reflected or diffused and weakened sunlight. In cases where the windows of a gallery are in the vertical walls and have an uninterrupted view of the horizon, the blue light reflected is comparatively small, the light near the horizon being distinctly more like sunlight than is that nearer the zenith. In galleries lighted like those at South



Kensington by skylights the light to which pictures are subjected is on the whole bluer. The artificial lights to which water-colours are exposed are gaslight, the arc and incandescence electric lights, and the first and last are very deficient in blue rays.

In conducting the experiments it became necessary to choose the light which would most readily adapt itself to giving a clue as to which colours were affected by exposure in a time which would be measured by months instead of by years. A careful consideration led us directly to avail ourselves of as much sunlight as we could secure in this rather sunless climate of ours, together with the diffused and skylight, when sunshine was absent, which would act less energetically. We are aware that writers have expressed themselves as disinclined to accept deductions as to the fading of pigments when exposed to this bright light of the sun, but they have, as far as we are aware, never given any serious reasons for their disinclination. Their arguments have usually been based upon their own convictions rather than on experimental proof of any kind, or if experimental proof has been quoted from other writers, half the truth or more is most frequently and probably unwittingly concealed. Probably, however, they express what is in the minds of many, so we shall enter somewhat fully into the arguments which decided us to adopt the step we did.

To the eye the hue of the lights mentioned above undoubtedly differ considerably, and unless the cause of the difference had been tracked out experimentally, and with scientific exactness, it would have been unwise to have chosen out any one of them with which to conduct experiments, since the results obtained with it might not be applicable to any other. Happily, however, for such work, the spectroscopic analysis of light furnishes irrefutable evidence that from the results obtained from exposure to one light, correct deductions may be made as to what would happen were the exposure made to another.

The results of the experiments with various colours are dealt with in detail, and include the exposure of colours to light, to dry air, to moist air, to light in presence of hydrogen, to light in vacuo, and also the results of experiments with the colours as they are affected by combustion of gas, heat without light, electric light, &c. Besides single colours the action of light was tried on mixtures of two or more colours, Sir J. D. Linton and Mr. E. J. Poynter and others having been consulted. Whatman's paper was used, and the colours to be tested were applied by a practised hand to the paper in a series of washes. Two strips cut from the same sheet were introduced into a glass tube  $\frac{3}{4}$ -inch in diameter and 2 feet long. The tubes were hung in the open against a wall facing south in full sunshine. One half of each tube being covered with American cloth, the two pieces of identically tinted coloured paper were under the exact same conditions in all respects, except that one was exposed to light and the other was in the dark. The following (table 2 in report) shows approximately the order of instability of the single colours in open tubes exposed in an ordinary atmosphere, beginning with the most fugitive:—

Carmine, crimson lake, purple madder, scarlet lake, Paynes grey, Naples yellow, olive green, indigo, brown madder, gamboge, Vandyke brown, brown pink, Indian yellow, cadmium yellow, Leitches blue, violet carmine, purple carmine, sepia, aureolin, rose madder, permanent blue, Antwerp blue, madder lake, vermilion, emerald green, burnt umber, yellow ochre, Indian red, Venetian red, burnt sienna, chrome yellow, lemon yellow, raw sienna, terra verte, chromium oxide, Prussian blue, cobalt, French blue, and ultramarine ash.

Of these thirty-nine single colours, the twelve latter were not acted upon at all by light, and two others were only after this long exposure to direct sunlight very slightly faded. All these, except Prussian blue, are purely mineral colours. Of thirty-four mixtures tried, only three remained absolutely unchanged; but six containing Prussian blue, although at first altered, after being placed in the dark for six weeks or more, returned more or less to their original colours.

In experimenting with light in dry air mostly the same pigments were used. Thirty-eight experiments were made with single colours, but under this altered condition twenty-two instead of twelve were found to be permanent, principally those colours which in the former experiments were only very slightly faded. In two cases the colour in the open tube was not acted on, while that in the dry tube was; these cases are brown madder and Prussian blue. The colours which were unchanged in dry air, but were acted on in ordinary air, are madder lake, cadmium yellow, Naples yellow, emerald green, olive green, Paynes grey, sepia, and burnt umber. Again, with the single exception of madder lake, all the above which were not acted on in dry air are mineral colours.

For exposure of colours to light in moist air, the paper was saturated with moisture, and was sealed up in tubes containing moist air. Thirty-seven experiments with single colours were made. Only ten colours withstood the action of light under this condition; these were Indian red, Venetian red, burnt sienna, yellow ochre, raw sienna, emerald green, terra verte,

chromium oxide, cobalt, and ultramarine ash. No vegetable colour is in this list; and both Prussian blue and Antwerp blue were entirely destroyed. Twenty-nine mixtures were also tested in a similar way, and only two remained unchanged; these were raw sienna and Venetian red, and cobalt and Indian red.

In a series of experiments made in which the colour was exposed in an atmosphere of moist hydrogen gas, thirty-six were made with single colours, and of these no less than twenty-two remained unchanged; even carmine and crimson lake did not alter, neither did madder lake, Indian red, Venetian red, brown madder, burnt sienna, chrome yellow, yellow ochre, raw sienna, terra verte, chromium oxide, olive green, indigo, cobalt, French blue, ultramarine ash, permanent blue, Paynes grey, sepia, Vandyke brown, and burnt umber.

In exposure of colours in vacuo hardly any colour was affected by light, and action where it occurred was very feeble. Mixtures containing Prussian blue changed, the other colour becoming dominant. Vermilion also blackened. With other mixtures hardly any change occurred. With colours placed in a close cupboard, lighted by gas, and of course free from moist air, hardly any change occurred. Under exposure to electric light, the light falling on the colours is estimated as having an illuminating value of 2,000 candles at a foot off, little change, and in the majority of cases no change, took place with colours or mixtures. The colours selected for testing in this case were those most easily acted on, some in a frame with a glass in front and others in sealed tubes with moist air, being the most favourable condition for fading. The action of heat without light was tested by sealing strips of colours in tubes with moist air and heating them seven hours a day for three weeks in boiling water, all light being excluded. Indian yellow changed very decidedly, a mixture of Prussian blue and gamboge went brown, also a mixture of Prussian blue and burnt sienna and Prussian blue and raw sienna, Antwerp blue, Leitches blue, and permanent blue all bleached. In a second experiment the permanent blue did not change. Indigo and Venetian red also bleached very slightly and became more red in colour, whereas carmine, crimson lake, vermilion, Venetian red, Prussian blue, indigo, sepia, and brown pink underwent no change. Two tubes with rose madder were used, one of them bleached very slightly, the other not at all.

The action which must occur on diluting any colours with a solid white medium, such as Chinese white, is pointed out, but it is stated that but few comparative experiments have yet been made. Mixtures of rose madder and Indian yellow, and of Prussian blue and gamboge, when mixed with Chinese white faded more rapidly than without it, and a mixture of Prussian blue and crimson lake are strikingly acted on, for without Chinese white the mixture becomes blue, but if mixed with Chinese white it becomes of a bright pink colour. The fading of Prussian blue appears to be brought about by the addition of Chinese white. On the general question the deduction is made that fading is chiefly due to the blue rays of light, and that between sunlight and skylight of equal intensity sunlight is the safest, since it contains a far less proportion of blue light than does skylight.

The final results, it is explained, were obtained after an exposure between May 1886 and March 1888, during which time there had been about 3,000 hours of sunshine in all, 2,100 of which we may take it fell on the colours. Making the same estimates as before, we find that this was equivalent to 8,800 hours of mean blue skylight. There would be left about 8,000 hours of light during which no sun was shining. Taking it as before, we should find that this was equal to 6,000 hours of subdued blue skylight, and, when reduced to one-third, would be equivalent to 2,000 hours of mean bright blue skylight. This, with the sunlight, would give a total of 10,800 hours of the blue skylight to which the pigments were exposed, or about 4.8 times the amount which they received between May and August 1866. To produce the final result, therefore, we should have had to expose them in the gallery for at least 480 years, and to the gaslight continuously for 9,600 years. Had we exposed to the whole of the light coming from the southern sky alone, shielding the colours from direct sunlight, we should have had to extend our observations for four years, and if to a northern sky probably for nearer 10 years, since the mean brightness of the latter is considerably less than the former.

Among the conclusions arrived at it is found that mineral colours are far more stable than vegetable colours, and amongst those colours which have remained unaltered, or have only very slightly changed after an exposure to light of extreme severity, a good gamut is available to the water-colour artist.

The presence of moisture and oxygen are in most cases essential for a change to be effected, even in the vegetable colours. The exclusion of moisture and of oxygen, particularly when the latter is in its active condition, as experiments to be described in the next report will show, would give a much longer life, even to these, than they enjoy when freely exposed to the atmosphere of a room. It may be said that every pigment is



permanent when exposed to light "in vacuo," and this indicates the direction in which experiments should be made for the preservation of water-colour drawings.

The effect of light on a mixture of colours which have no direct chemical action on one another, is that the unstable colour disappears, and leaves the stable colour unaltered appreciably.

The experiments also show that the rays which produce by far the greatest change in a pigment are the blue and violet components of white light, and that these, for equal illumination, predominate in light from the sky, whilst they are less in sunlight and in diffused cloud light, and are present in comparatively small proportion in the artificial lights usually employed in lighting a room or gallery. They have also shown that about a century of exposure would have to be given to water-colour drawings in galleries lighted as are those at South Kensington before any very marked deterioration would be visible in them, if painted with any but the more fugitive colours, and that when the illumination is of the same quality as that of gaslight, or of the electric glow light rendered normally incandescent, and of the same intensity as that employed in those galleries, an exposure to be reckoned by thousands of years would have to be given to produce the same results.

## Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

### ADDISON ON ARCHITECTURE.

ACCORDING to Dr. Johnson everybody who desires to write in a style that is elegant without being ostentatious, and familiar without being coarse, should give days and nights to the study of Addison's essays, but it is to be feared that very few now follow the advice of the sage of Fleet Street. One might ask, like Burke in respect to Bolingbroke, "Who now reads Addison?" Extracts from the *Spectator* are published as a school-book—which is an infallible way to make a writer disliked—and an occasional edition of the whole work may appear as part of a series, but opinion now runs in favour of Steele's papers rather than Addison's, as they are supposed to be inspired by a more genial spirit and affection. Whatever may be the eventual decision as to the relative worth of the two essayists, it ought not to be forgotten that the revival of "Queen Anne" was in a measure owing to admiration for Addison. Thackeray, while having a kindly feeling for the foibles of Steele, recognised the superiority of the scholar and moralist to whom poor Dick always looked up as if he were a small boy and his friend a monitor. In Thackeray's lectures, and especially in his "Esmond," the Queen Anne period assumed a new and ideal form, and the public were prepared to approve of anything which recalled it. The novelist having set the example of building a red-brick house, the imitation of the so-called Queen Anne style became easier.

It would not, however, be right to assume that Addison was filled with any affection for the English adaptations of Flemish buildings. He was never a patron of the builder's art. When he was not living in lodgings, or in a college-room, he could not be called the tenant of a house, and after his marriage he was not master when his wife was present. His views on Domestic architecture, assuming that he condescended to think of that subject, are unknown to us and are not to be inferred from any of his actions.

His one essay on an architectural subject (which we now reprint) shows that his ideal building was the Pantheon in Rome, and unless a work was great, uncommon or beautiful, it was not satisfactory in Addison's eyes. In the beginning of the eighteenth century he could discover few buildings in England that might be said to possess the desirable qualities, especially as he was incapable of recognising the beauties of any of the Gothic cathedrals or churches. Addison was deficient in a knowledge of art, but his essay is interesting as evidence of what was thought about architecture by the Englishman whose taste was the finest of his time. The original appeared on Thursday, June 26, 1712, and is part of the series on the Imagination.

*Addite tot egregias urbes, operumque laborem.*

VIRG. *Georg.* ii. 155.

Next add our cities of illustrious name,

Their costly labour, and stupendous frame.—DRYDEN.

Having already shown how the fancy is affected by the works of nature, and afterwards considered in general both the works of nature and of art, how they mutually assist and complete each other in forming such scenes and prospects as are most apt to delight the mind of the beholder, I shall in this

paper throw together some reflections on that particular art which has a more immediate tendency than any other to produce those primary pleasures of the imagination which have hitherto been the subject of this discourse. The art I mean is that of architecture, which I shall consider only with regard to the light in which the foregoing speculations have placed it, without entering into those rules and maxims which the great masters of architecture have laid down, and explained at large in numberless treatises upon that subject.

Greatness, in the works of architecture, may be considered as relating to the bulk and body of the structure, or to the manner in which it is built. As for the first, we find the ancients, especially among the eastern nations of the world, infinitely superior to the moderns.

Not to mention the tower of Babel, of which an old author says there were the foundations to be seen in his time which looked like a spacious mountain, what could be more noble than the walls of Babylon, its hanging gardens, and its temple to Jupiter Belus that rose a mile high by eight several storeys, each storey a furlong in height, and on the top of which was the Babylonian observatory? I might here likewise take notice of the huge rock that was cut into the figure of Semiramis, with the smaller rocks that lay by it in the shape of tributary kings; the prodigious basin, or artificial lake, which took in the whole Euphrates, till such time as a new canal was formed for its reception, with the several trenches through which that river was conveyed. I know there are persons who look upon some of these wonders of art as fabulous, but I cannot find any ground for such a suspicion, unless it be that we have no such works among us at present. There were indeed many greater advantages for building in those times, and in that part of the world, than have been met with ever since. The earth was extremely fruitful, men lived generally on pasturage, which requires a much smaller number of hands than agriculture. There were few trades to employ the busy part of mankind, and fewer arts and sciences to give work to men of speculative tempers, and, what is more than all the rest, the prince was absolute, so that when he went to war he put himself at the head of a whole people; as we find Semiramis leading her three millions to the field, and yet overpowered by the number of her enemies. 'Tis no wonder, therefore, when she was at peace, and turning her thoughts on building, that she could accomplish such great works with such a prodigious multitude of labourers; besides that in her climate there was small interruption of frosts and winters which make the northern workmen lie half the year idle. I might mention, too, among the benefits of the climate what historians say of the earth, that it sweated out a bitumen or natural kind of mortar, which is doubtless the same with that mentioned in Holy Writ, as contributing to the structure of Babel. Slime they used instead of mortar.

In Egypt we still see their pyramids, which answer to the descriptions that have been made of them; and I question not but a traveller might find out some remains of the labyrinth that covered a whole province, and had a hundred temples disposed among its several quarters and divisions.

The wall of China is one of these eastern pieces of magnificence which makes a figure even in the map of the world, although an account of it would have been thought fabulous were not the wall itself still extant.

We are obliged to devotion for the noblest buildings that have adorned the several countries of the world. It is this that has set men at work on temples and public places of worship, not only that they might, by the magnificence of the building, invite the Deity to reside within it, but that such stupendous works might at the same time open the mind to vast conceptions, and fit it to converse with the divinity of the place. For every thing that is majestic imprints an awfulness and reverence on the mind of the beholder, and strikes in with the natural greatness of the soul.

In the second place, we are to consider greatness of manner in architecture, which has such force upon the imagination that a small building where it appears shall give the mind nobler ideas than one of twenty times the bulk, where the manner is ordinary or little. Thus perhaps a man would have been more astonished with the majestic air that appeared in one of Lysippus's statues of Alexander, though no bigger than the life, than he might have been with Mount Athos, had it been cut into the figure of the hero, according to the proposal of Phidias, with a river in one hand, and a city in the other.

Let anyone reflect on the disposition of mind he finds in himself at his first entrance into the Pantheon at Rome, and how the imagination is filled with something great and amazing! and at the same time consider how little in proportion he is affected with the inside of a Gothic cathedral, though it be five times larger than the other, which can arise from nothing else but the greatness of the manner in the one, and the meanness in the other.

I have seen an observation upon this subject in a French author, which very much pleased me. It is in M. Freart's parallel of the ancient and modern architecture. I shall give



it the reader with the same terms of art which he has made use of. "I am observing," says he, "a thing which, in my opinion, is very curious, whence it proceeds that in the same quantity of superficies the one manner seems great and magnificent, and the other poor and trifling; the reason is fine and uncommon. I say, then, that to introduce into architecture this grandeur of manner, we ought so to proceed that the division of the principal members of the order may consist but of few parts, that they be all great and of a bold and ample relieve and swelling, and that the eye beholding nothing little and mean the imagination may be more vigorously touched and affected with the work that stands before it. For example, in a cornice, if the gola or cymatium of the corona, the coping, the modillions or dentelli make a noble show by their graceful productions, if we see none of that ordinary confusion which is the result of those little cavities, quarter rounds of the astragal, and I know not how many other intermingled particulars which produce no effect in great and massy works, and which very unprofitably take up place to the prejudice of the principal member, it is most certain that this manner will appear solemn and great, as, on the contrary, that it will have but a poor and mean effect where there is a redundancy of those smaller ornaments, which divide and scatter the angles of the sight into such a multitude of rays so pressed together that the whole will appear but a confusion."

Among all the figures of architecture there are none that have a greater air than the concave and the convex, and we find in all the ancient and modern architecture, as well in the remote parts of China as in countries nearer home, that round pillars and vaulted roofs make a great part of those buildings which are designed for pomp and magnificence. The reason I take to be, because in these figures we generally see more of the body than in those of other kinds. There are, indeed, figures of bodies, where the eye may take in two-thirds of the surface; but as in such bodies the sight must split upon several angles, it does not take in one uniform idea, but several ideas of the same kind. Look upon the outside of a dome, your eye half surrounds it; look upon the inside, and at one glance you have all the prospect of it; the entire concavity falls into your eye at once, the sight being as the centre that collects and gathers into it the lines of the whole circumference. In a square pillar the sight often takes in but a fourth part of the surface, and, in a square concave, must move up and down to the different sides before it is master of all the inward surface. For this reason the fancy is infinitely more struck with the view of the open air and skies that passes through an arch than what comes through a square or any other figure. The figure of the rainbow does not contribute less to its magnificence than the colours to its beauty, as it is very poetically described by the son of Sirach, "Look upon the rainbow, and praise Him that made it; very beautiful it is in its brightness; it encompasses the heavens with a glorious circle, and the hands of the Most High have bended it."

Having thus spoken of that greatness which affects the mind in architecture, I might next show the pleasure that rises in the imagination from what appears new and beautiful in this art; but as every beholder has naturally a greater taste of these two perfections in every building which offers itself to his view than of that which I have hitherto considered, I shall not trouble my reader with any reflections upon it. It is sufficient for my present purpose to observe that there is nothing in this whole art which pleases the imagination but as it is great, uncommon, or beautiful.



#### A Royal College of Architecture.

SIR,—In conclusion, I desire to protest against Mr. Fleming's illogical method of argumentation, and I feel sorry to have to accuse him of repeated *ignoratio elenchi*. Since I shall not, for the present, again address you on this subject, for the very good reason stated in the commencement of my last letter, therefore I hope no one will think it fair to misunderstand and to so criticise this one particular letter in such a manner as to tempt me to reply. But in any case I shall not presume to further occupy attention on a matter concerning which I deny the privilege of competence to abler men than myself.

The discussion and organisation of extensive university schemes is not my forte. As Mr. Fleming truly says, it would require a paid organiser of no mean abilities. My first two letters were all I had intended, until he interrupted what might have been a truly profitable sifting of the subject, for doubtless others would have enlarged thereon.

My whole scheme rests solely upon the contents of those first two letters, and not upon that casual, though very significant item, "the ventilation of a grievance," as any practised

logician would have known. Now there is nothing in those two first letters which Mr. Fleming has or can disprove; no, nor in anything I have written subsequently. In them will be found the outcome of a practical, personal, and thorough acquaintance with what is wanted, and in a very ordinary and common-sense manner I presumed to suggest a remedy. Mr. Fleming informs me that his Society cannot possibly undertake anything so extensive; the which I thoroughly believe. I never asked it to; in fact, I have already said it is beyond the reach of the Architectural Association.

The whole matter resolves itself into a triangular problem:—(1) Some such provision is needed; (2) it is within the means of unselfish and energetic co-operative efforts; (3) who will do it?

One only of these necessary quantities is absent. Will Mr. Fleming answer me which? In France, that home of architecture and art, given the two first, and the last would immediately present itself. Such would also be the case with her young and willing pupils in the United States; yea, such is already the case in both countries.

Am I to believe that Mr. Fleming really desires me to communicate with the secretary of the Affiliated Societies' sub-committee of the Association (Architectural Association, I presume)? I do not know them. Mr. Fleming says he issued the circular-letter. Should I not write to him? I am in a dilemma. I know not with whom to communicate. In that letter occurs the regal *We*. "The men *we* want to reach;" perhaps "*we*" means the sub-committee, Architectural Association. However, this, with the circumstance of a copy gratis of the Architectural Association "Notes," appears to make it a rather delicate question as to how far, and to what intent, the publication of the letter is private.

If private, as Mr. Fleming claims it to be, then with what additional force does my former remark apply:—"The very vagueness, the want of assurance that a determined effort was about to be made, doubtless caused many business men to little heed what must have appeared to them a well-meaning attempt, but without backbone."\* I wonder not that only fifty replies came to hand. Must I accept the "majority" out of ten per cent. as final? Reason forbids me!

No, sir, I will communicate with neither. I am consistent, and I decline to co-operate with any non-responsible person or persons, since I have already expressed my belief that the resources of the Architectural Association are totally inadequate. Of course, should the Royal Institute of British Architects help them in this matter, then the aspect changes; but under those circumstances there is little doubt that the Royal Institute would be overwhelmed with eager assistance from its own ranks, without me; failing which, here I am, *pro bono publico*.

Further, I am at a loss to understand why Mr. Fleming encourages my ideal of a local society in Worcester, while in the same breath he denounces it as impossible—to the Architectural Association. However, he must not imagine that I dream of a Worcester Architectural Society as apart from the general scheme; it would not thus work, and although his sub-committee may think it practicable, I do not. Mr. Fleming also adds that the Royal Institute of British Architects cannot undertake any sufficiently extensive scheme, and although I would rather not accept this information second-hand, yet, if such be the case, then I gladly lay aside my ideas for the present, and anxiously await that enlargement of the scope of the Architectural Association for which he appeals towards the close of his first letter.† If I cannot get all I want, is it reason to refuse part thereof?

Space prevents me to advise upon the uselessness of a little knowledge of logic—it is not like architecture. Perhaps Mr. Fleming will draw his own inference, and learn in the future to distinguish between the main issue and any apt side reference; and also not to imagine that everybody else usually attempts to float theories which they can neither understand or substantiate.

And now, having done all that in me lies to secure the gracious attention of those most concerned, with many apologies, I remain, yours truly,

Worcester: August 2, 1888. FRÉDÉRIC E. THOMASSON.

#### Contrast or Harmony?

SIR,—Can any of your readers advise me in the following matter? I have enlarged an Elizabethan house for a client, the extension being considerably larger than the old part. Old and new work are of stone from the same quarry—a hard sandstone. The old walls are of course a beautiful dark grey, the new ones very light, but still of an agreeable tint. My client objects to the contrast, and proposes to "reface" the old work, to which I of course object. The only alternative he gives me is that I may darken the new walls. How may this best be done to look well and not interfere with the mouldings?—Yours sorrowfully,

IN A FIX.

\* *The Architect*, July 20, 1888.

† *The Architect*, July 6, 1888.



## SCHOOL BUILDINGS.

**Manchester.**—Building operations for new schools at Monton Green, near Manchester, have just been commenced, adjoining the church erected here some time ago. The schools are intended to be a memorial to the late Mrs. Booth, and other members of a family who have been large benefactors to the church. The building will be faced with stone parpoints and Darley Dale ashlar, and contains large school and classrooms for boys, girls, and infants on the ground floor, with meeting room 64 by 32 feet, and social rooms for the use of the congregation on the first floor. Messrs. Thomas Worthington & John G. Elgood, of Lombard Chambers, 46 Brown Street, Manchester, are the architects, and the general contractors are Messrs. W. Southern & Sons, of Salford.

## CHURCH BUILDING AND RESTORATION.

**Llandovery.**—The memorial chapel to Williams Pantycelyn, at Llandovery, was opened on Tuesday last. The cost of the building was 2,200*l.* Accommodation is provided for about 280 worshippers. The architect is Mr. John H. Phillips, of Cardiff.

**London.**—The new church of St. Philip, just opened in Buckingham Palace Road on a site given by the Duke of Westminster, who also gave 4,000*l.* to the building fund, is for a new parish to be formed out of St. Michael's, Chester Square. The building consists of nave and chancel, 120 feet long by 27 feet wide, and north and south aisles 13 feet wide, north and south transepts, morning chapel, and large vestries, with organ chamber over. The accommodation is by chairs for 850 people, and the total cost will be about 8,000*l.* The walls are faced outside with Gainsborough pressed bricks. Inside they are plastered, and have Bath stone dressings. The core of the walls is cement concrete, bonded with hoop iron. The roofs are of pitch pine covered with tiles, and the flèche, which rises to a height of 100 feet, is covered with copper by Messrs. Ewart & Son. The floors are laid with Messrs. Davison & Creed's patent wood-block flooring; the heating is Grundy's hot-air system. Messrs. Macey & Sons, of the Strand, were the general contractors; Mr. Robinson, of Bloomsbury, made the oak stalls; Messrs. Daymond & Son, of Vauxhall Bridge Road, the pulpit; and Mr. G. W. Milburn, of York, the font. Messrs. Carter, Johnson & Co. did the encaustic tiling; the wrought-iron work and gas-fittings were executed by Messrs. Starkie, Gardner & Co. A peal of seven Harrington's chimes has been fixed in the flèche. Messrs. Demaine & Brierley, of York, are the architects, and Mr. T. W. Creed the clerk of works.

**Old Malton.**—The restoration of the old Priory Church, under the supervision of Mr. Temple Moore, F.S.A., is approaching completion. The church is one of the finest remaining houses of the old order of Gilbertines. About ten years ago the lay rector, Earl Fitzwilliam, spent 3,000*l.* on the restoration of the tower and south walls, and the vicar, the Rev. E. A. B. Pitman, is now endeavouring to carry out an idea suggested by the late Sir Gilbert Scott, to make the restoration thoroughly complete, so that the old church may stand an historic monument of the past for many years to come. The work of restoration is now approaching completion. A solid new lead-covered oak roof has been put on, and the floor of the church has been lowered several feet to its original level, showing the beautiful bases of the finely-carved pillars, almost as fresh as when erected nearly 700 years ago. The walls have been cleared of unsightly plaster, the old furnishings entirely removed, and new (patent) Grundy's heating apparatus inserted; the whole of the floor paved with Lowe's wood pavement in neat design; the windows have been reglazed, those at the west end being filled with coloured glass, whilst the chancel floor and sacarium has been paved with coloured tiles. Other very necessary work has been done, but much more remains to be accomplished in the way of re-furnishing, &c., before the original idea of a thorough restoration can be carried out. The contracts for the chief work—new roofs, floor, &c.—amounted to about 1,950*l.*

**Seacombe.**—The foundation-stone of the church of Our Lady and St. Joseph has been laid by the Roman Catholic Bishop of Shrewsbury. The building will be in Gothic style of architecture. The principal dimensions are as follows:—Length of nave and chancel 125 feet, to be extended to about 135 feet when the porches are built; width of nave from centre to centre of columns, 29 feet; width across aisles, 53 feet; height from floor to nave ridge outside, 60 feet. The hot-air heating apparatus will be supplied by Mr. John Grundy. The building is being erected by Mr. John Shaw, of Priory Street, Birkenhead, from the designs of Mr. Edmund Kirby, architect, 5 Cook Street, Liverpool. Mr. H. L. Whittingham is the clerk of works. The external walls will be of Liscard sandstone facings, with red Runcorn stone dressings to the aisle and

clerestory windows and all other door and window openings. The windows will be glazed with lead glazing, the ceiling of panelled pitch pine, the chancel walls and roof corresponding in height to the nave. There will be seating accommodation in the church for about 600 persons.

**Northampton.**—The restoration of All Saints Church has been taken in hand. Inside the decorative work is being done by Messrs. Smith Bros. The stonework, exterior and interior, will be carried out by Mr. Beardmore, and the painting by Mr. Goy. The east window is to be filled up by a large painting of the Crucifixion, which will be executed by Messrs. Heaton, Butler & Bayne. On either side of this will be painted the Decalogue, the existing form of which will be removed to the west gallery, where will also be placed the pictures of Moses and Aaron. The chancel itself will also be completely restored. The work is being done from the designs of Mr. E. Law.

## GENERAL.

**The Liverpool Arts Committee** have agreed to make a loan of pictures from the permanent collection for exhibition at Wolverhampton.

**Mrs. Warrington Wood**, widow of the late Mr. Warrington Wood, sculptor, has offered to the Warrington Corporation the whole of the original plaster casts of her husband's works. The casts will be conveyed from Rome at the cost of the Corporation.

**Mr. F. E. Kempson, F.R.I.B.A.**, Hereford, has been appointed surveyor of ecclesiastical dilapidations for the arch-deaconry of Monmouth. He was elected surveyor for the arch-deaconry of Llandaff in 1886, and is now, therefore, diocesan surveyor for the whole diocese of Llandaff.

**A Committee** has been appointed to carry out the restoration of Kettering parish church. The probable cost of the work is estimated by Mr. Blomfield to be about 7,000*l.*

**Mrs. Rushton**, of Bowden, has offered a sum of 2,000*l.* towards the erection of a church proposed to be built for the Peel district of Cloughfold.

**At Seville Cathedral** last week one of the pillars gave way, bringing away with it a portion of the roof, and destroying the organ. Two years ago attention was called to the dangerous condition of parts of the fabric.

**Mr. Doubleday**, of Colmore Row, Birmingham, has prepared plans for a first-class family and commercial hotel, which is to be built for Mr. G. Mountford, in Dalton Street, Birmingham.

**An Additional Building**, in connection with the Leeds General Infirmary, is to be erected at an estimated cost of about 30,000*l.*, to make provision for a medical children's ward, a casualty-room, and isolation wards.

**Mr. P. C. Lockwood**, after holding the post of borough surveyor of Brighton for thirty years, has sent in his resignation to the Town Council.

**The Design** of Messrs. Demaine & Brierley, architects, of York, has been selected for a new church and mission hall, for the newly-formed parish of St. Thomas, Kensal Town, London. The estimated cost is 5,500*l.* Five London architects were also invited and submitted designs.

**The Poplar Board of Works** have succeeded in obtaining a rule *nisi* calling on the East and West India Docks Company to show cause why a *mandamus* should not issue compelling them to rebuild bridges connecting the Isle of Dogs with the mainland.

**The Top Stone** of the steeple of St. Michael's Church, Coventry, has been replaced, thus practically completing the work of restoration. The height to the weather-cock is 303 feet.

**Messrs. Worthington & Elgood** have changed their address to No. 46 Brown Street, Manchester.

**A Roman Amphitheatre** has been discovered in a cornfield at Deutsch Altenburg, on the Danube. The state of part of the crop indicated a stony subsoil in the form of a circle, and excavations were made, which brought to light the uppermost gallery of an amphitheatre.

**The Devil's Bridge**, over the River Reuss, near Andermatt, fell in on Tuesday. The structure, a single arch of granite of 26 feet span, was constructed in 1830, 100 feet above the picturesque cascade.

**A Fire** broke out last week in a tenement at West Quay, Port Glasgow. The concentration of the sun's rays through a knob in the glass of one of the old windows is supposed to have caused the fire.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, AUGUST 10, 1888.

## TENDERS ETC.

*As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.*

*Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."*

## EDITORIAL NOTICES.

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## COMPETITION OPEN.

GORTON.—Sept. 15.—Designs are Invited for Public Baths. Mr. R. T. Holland, Clerk to the Local Board, Local Board Offices, Gorton.

## CONTRACTS OPEN.

BARROW-IN-FURNESS.—Aug. 11.—For Building Board School. Mr. John Harrison, 16 Hartington Terrace, Barrow-in-Furness.

BATLEY.—Aug. 17.—For Building Houses. Mr. Thomas Howdill, Architect, 13 Oxford Row, Leeds.

BELFAST.—Aug. 16.—For Erection of Constabulary Barracks at Mount Pollinger. Mr. W. B. Soady, Secretary, Office of Public Works, Dublin.

BELFAST.—Aug. 20.—For Building Sunday School. Mr. James J. Phillips, Architect, 21 Arthur Street, Belfast.

BRADFORD.—Aug. 10.—For Alterations, Old Crown Inn, Ivegate. Messrs. Robertshaw & Son, Architects, 55 Tyrrel Street, Bradford.

BRADFORD.—Aug. 20.—For Altering Salem Chapel for School Board Office. Mr. C. H. Hargreaves, Architect, Craven Bank Chambers, Bradford.

CARDIFF.—Aug. 13.—For Reconstruction of House on the Flat Holmes Island. Mr. W. Harpur, Borough Engineer, Cardiff.

CILFYNYDD.—Aug. 11.—For Building Eleven Cottages and a Shop. Mr. Thomas Roderick, 24 Clifton Street, Aberdare.

CORK.—Aug. 11.—For Heating St. Colman's Cathedral, Queenstown. Mr. G. C. Ashlin, Architect, Sun Chambers, Trinity Street, Dublin.

Craven Arms.—Aug. 14.—For Building Corn Exchange, Assembly Rooms, &c. Messrs. Rogers & Rogers, Craven Arms, Salop.

DERBY.—Aug. 11.—For Erection of Infectious Diseases Hospital. Mr. R. J. Harrison, Borough Surveyor, Derby. Mr. J. Jones, Clerk, Municipal Offices, Derby.

DEWSBURY.—Aug. 17.—For Building Two Dwelling-houses. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

DURHAM.—Aug. 13.—For Building Observatory Ward at Sedgefield Asylum. The County Engineer, Shire Hall, Durham.

EAST BOLDON.—Aug. 11.—For Building Wesleyan Chapel. Mr. W. Milburn, jun., Architect, 35 West Sunnyside, Sunderland.

ELLENBOROUGH.—Aug. 11.—For Additions to National Schools. Mr. J. Clark, Netherhall Estate Office, Maryport.

FOLKESTONE.—Aug. 17.—For Heating Buildings of the Pleasure Gardens. Mr. Seymour Clarke, General Manager, Folkestone.

HALIFAX.—Aug. 18.—For Building Shop and Offices. Mr. S. Wilkinson, Architect, Sowerby Bridge.

HEXHAM.—Aug. 13.—For Supplying and Laying Cast-iron Water Pipes. Mr. Hubert Laws, C.E., 18 Grainger Street West, Newcastle-on-Tyne.

ISLE OF MAN.—Aug. 25.—For Constructing and Erecting Wrought-Iron Girder Bridge, with Two Opening Spans across Harbour at Ramsey. Mr. T. J. Lilley, Engineer, 4 Westminster Chambers, Victoria Street, Westminster.

LEAMINGTON.—Aug. 13.—For Alterations and Heating by Hot Water of Fire Engine Shed. Mr. W. de Normanville, Borough Engineer.

LONDON.—Aug. 26.—For Erection of Buildings at Ambulance Station, Old Kent Road. Mr. T. W. Aldwinckle, Architect, 2 East India Avenue, E.C.

LONDON.—Aug. 28.—For Construction of Foundations for proposed General Post Office North, St. Martin's-le-Grand. Drawings, &c., at H.M. Office of Works, 12 Whitehall Place, S.W.—Mr. W. H. Primrose, Secretary.

LUTON.—Aug. 13.—For Additions, &c., to Workhouse. Messrs. J. R. Brown & Son, Architects, Cheapside, Luton.

PETERBOROUGH.—For Building House. Mr. J. G. Stallebrass, Bamber Street, Peterborough.

SHIPLEY.—Aug. 11.—For Building Banking Premises. Mr. Herbert Isitt, Architect, Queen Anne Chambers, Bradford.

ST. ANDREW'S BRIDGE.—Aug. 14.—For Building Dwelling-house. Mr. Silvanus Trevail, Architect, Truro.

TRURO.—Aug. 11.—For Building Premises. Mr. W. Swift, Architect, 31 Lemon Street, Truro.

WIGAN.—Aug. 15.—For Building Offices at the Gasworks. Mr. J. Timmins, Engineer, Gasworks, Wigan.

WILTON.—Aug. 13.—For Turret Clock for Town Hall. Mr. H. J. King, Town Clerk.

WREXHAM.—Aug. 18.—For Building Parsonage, Boundary Walls, &c. Mr. Edward Jones, Architect, 12 Temple Row, Wrexham.

## TENDERS.

### ACTON.

For Erection of Shops, High Street, Acton, W., for Mr. J. Beauchamp. Mr. EDWARD MONSON, jun., A.R.I.B.A., Architect, Grosvenor House, The Vale, Acton, W.

J. Edwards, Ealing	£4,050	0	0
T. Nye, Ealing	3,939	0	0
Penny & Co., Ealing	3,645	0	0
G. Hooper, Acton	3,553	0	0
G. LYFORD, Shepherd's Bush (accepted)	3,450	0	0



**ASHTON-UNDER-LYNE.**

For Additions to Volunteer Inn, Ashton-under-Lyne. Messrs.  
JOHN EATON & SONS, Architects, Ashton-under-Lyne.  
Quantities by Architects.  
JOHN ROBINSON, Ashton-under-Lyne (accepted) £620 0 0

**BEDFORD.**

For Internal Painting at the Bedford General Infirmary,  
Messrs. USHER & ANTHONY, Surveyors, Bedford.  
Judge & Ball, Bedford . . . . . £130 0 0  
Small & Co., Bedford . . . . . 115 12 0  
KEY, Bedford (accepted) . . . . . 108 0 0  
For Wrought-iron Fence at the Bedford General Infirmary.  
Messrs. USHER & ANTHONY, Surveyors, Bedford.  
Page & Co., Bedford . . . . . £109 14 6  
Kilpin & Billson, Bedford . . . . . 106 15 0  
Bacchus & Ison, Bedford . . . . . 85 0 0  
BAKER, Bedford (accepted) . . . . . 83 15 0

**BRADWELL-ON-SEA.**

For Alterations and Additions to Farmhouse, Bradwell-on-Sea,  
Essex, for Mr. Jos. Willes. Mr. HAROLD O. JACKSON,  
Architect.  
H. Bishop, Southminster . . . . . £120 0 0

**'BRONSEIONT.**

For Alterations to the Carnarvon Cottage Hospital, Bronseiont.  
Mr. RICHARD J. DAVIDS, Architect, Carnarvon.  
Edward Parry, Carnarvon (schedule).

**CARDIFF.**

For Construction of Flushing Tanks, for the Cardiff Corpora-  
tion.  
J. C. Pearson, Cardiff . . . . . £796 15 0  
Ellis & Davies, Cardiff . . . . . 780 0 0  
J. Allan, Cardiff . . . . . 765 0 0  
E. Turner & Sons, Cardiff . . . . . 648 0 0  
T. REES, jun., Ely, Cardiff (accepted) . . . . . 539 0 0

**CHESHUNT.**

For New Conservatory, Lavatory, and other works to Residence,  
Cheshunt, Herts, for Mr. Wm. J. Galloway. Mr. HAROLD  
O. JACKSON, Architect.  
Crompton & Fawkes, Chelmsford . . . . . £330 0 0

**CHESHUNT—continued.**

For Alterations and Additions to Residence, Cheshunt, Herts,  
for Mr. John Crawter. Mr. HAROLD O. JACKSON,  
Architect.  
J. Bentley, Waltham Abbey . . . . . £1,740 0 0  
W. Littlefield, Enfield . . . . . 1,427 0 0  
F. Sanders, Cheshunt . . . . . 1,357 0 0

**HADLOW DOWN.**

For Alterations and Additions (allowing for old materials) at  
Hadlow Grange, Hadlow Down, Sussex. Mr. GEO. H.  
FELLOWES PRYNNE, A.R.I.B.A., Architect. Quantities  
supplied by Mr. R. Henry Hale, Surveyor.  
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Flint & Maddeford	2,449	0	0
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Martin Wells & Co.	193	14	0
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Flint & Maddeford	179	7	0
Loosley	174	18	0

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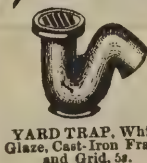
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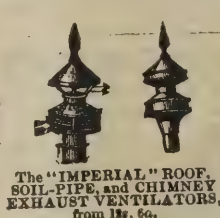
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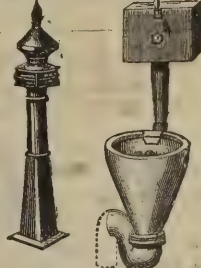
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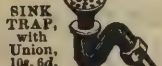
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Harris & Wardrop	320	0	0
J. H. Johnson	319	0	0
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Harris & Wardrop	220	0	0
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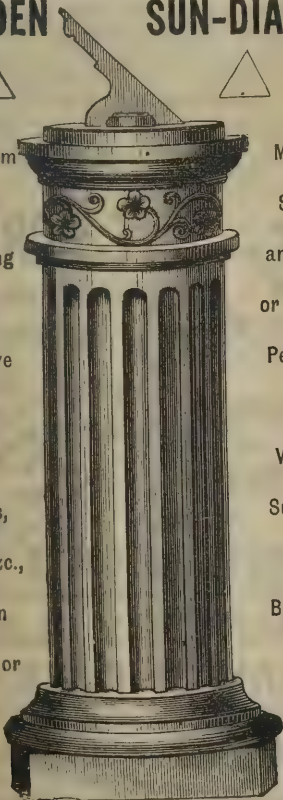
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H. W. Wilkinson & Co., Dockhead . . . £894 0 0  
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E. Gabbott, Liverpool . . . £7,157 0 0  
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J. Williams, Knighton . . . 6,500 0 0  
J. Gethin, Shrewsbury . . . 6,389 0 0  
T. Foster, Abergavenny . . . 6,337 0 0  
Treasure & Son, Shrewsbury . . . 6,288 0 0  
Shillitoe & Sons, Bury St. Edmunds . . . 6,229 0 0  
J. Grosvenor, Ludlow . . . 6,200 0 0  
Edwards, Leominster . . . 6,180 0 0  
J. Everd, Malvern . . . 6,112 0 0  
Horsman & Co., Wolverhampton . . . 6,100 0 0  
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Somerford & Son . . . 342 0 0  
W. Owen . . . 337 0 0  
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For Erection of New Bakery at Rushden, Northamptonshire, for Mr. W. Hipwell. Messrs. USHER & ANTHONY, Architects, Bedford.  
Harrison, Bedford . . . £960 0 0  
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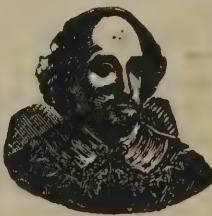
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## TRADE NOTES.

WE are glad to see that Messrs. J. B. Orr & Co., Limited, of 48 Cannon Street, E.C., have done an extensive work at the New Law Courts, Nottingham. Their Duresco has been used throughout the buildings with very great success, some four or five tons being employed.

A NEW small-pox hospital has been erected at Swinton, and special attention has been paid to the ventilation, Messrs. Robert Boyle & Son's latest improved patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

MR. JOHN GRUNDY, of 30 Duncan Terrace, City Road, London, and Tyldesley, Lancashire, has just been instructed to apply his patent warm air apparatus to heat the following buildings:—Crawthorne Church, Hants, under the direction of Mr. A. W. Blomfield, A.R.A.; Cork Lunatic Asylum, Mr. W. H. Hill, architect, Marlborough Street, Cork; Sherborne Abbey, Messrs. Carpenter & Ingelow, architects, Regent Street, W.; Hampstead Conservatoire, Mr. Rowland Plumble, architect, 13 Fitzroy Square, W.; St. Kevin's new Church, Dublin, Mr. T. Drew, R.H.A., architect, Dublin; Tiverton, for warming the Wesleyan Chapel, the Baptist Chapel, and Elm House; Seaforth, for warming the new Catholic Church, Mr. E. Kirby, architect, Liverpool; Haslemere Church, Mr. W. Penfold, architect, Westminster; Somerleyton Church, Mr. Horace Cory, architect, London; Halton Church, Messrs. Jeffery & Skiller, architects, Hastings.

MR. E. H. SHORLAND, of Manchester and London, has recently supplied his patent Manchester grates to the new Board schools, Castle Hill, Edinburgh. This makes the fifth school this year for the Edinburgh School Board which has been warmed and ventilated by means of Shorland's patent Manchester grates.

## WATERPROOFING MASONRY.

ASSUMING that the particulars of a process which absolutely preserves buildings from decay will be of interest to our readers, we give a few lines to the origin and merits of the process introduced to this country many years ago by Messrs. N. C. Szerelmey & Co., and now so successfully adopted. Colonel Szerelmey was an officer of Engineers in the Hungarian army, and during travels in Egypt in the pursuit of his studies concluded that some process must have been known to the ancients for preserving stone surfaces from corrosion and decay. He set himself the task of discovering such a process, and, believing he had succeeded, came to this country in 1855 to submit it to practical test. The time was opportune, for it was about two years after the completion of the new Houses of Parliament, and Sir Charles Barry, the architect, happened to be looking out for some method of preserving the stonework from decay, which had already begun to manifest itself, and also to preserve the ironwork of the roofs from rust. He examined many processes, and favoured Szerelmey's, but the matter being thought of great importance, the First Commissioner of Works availed himself of the best scientific assistance he could procure in an independent investigation. He employed Sir Roderick Murchison, then President of the Royal Geological Society, and the eminent Professor Faraday, and their conclusion, after an investigation extending over two years, was in favour of the Szerelmey process. They summarised its advantages in a report to the House of Commons in 1860. Professor Faraday stated:—"In my opinion the results of the trials (and I may say large experiments) made by Mr. Szerelmey are better than any of the rest, and, so far as one can form a judgment upon the experience of two years, justify the expectation that the process will sustain its character for a lengthened period of time." Sir Roderick Murchison added:—"I have no hesitation in saying that the process of Szerelmey is the best." The result was that the whole of the iron roofs of the House of Commons were painted with Szerelmey's iron paint, and a portion of the stonework was treated with his stone liquid. The Speaker's Court of the building affords very interesting evidence of what may be done in the direction of preserving stonework from decay, because the results of three phases of treatment may there be seen. The ashlar walls were thoroughly treated, and have been preserved; but the string course, which

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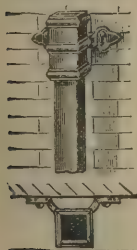
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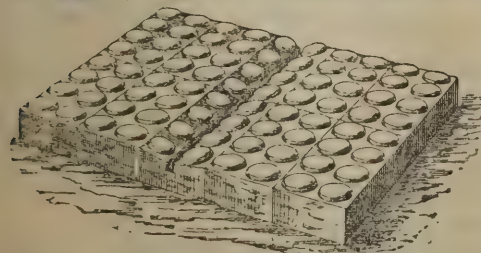
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FLOOR WITH GUTTERING



had previously been saturated with oil, thus preventing the stone liquid from having full effect, was only a partial success. Again, the porch of the Speaker's house, which was added after the other work had been completed, was not treated at all, decorative wash only being applied to it. This suffered very seriously from decay. The actual work done on Szerelmey's process is still uninjured by decay to the present time.

Many other buildings were also treated by the same process at the same time, and with considerable though not invariable success. If the process had not at that time reached perfection, it had, at any rate, shown capabilities worth development.

In 1875 the business came into the hands of the present owners, who at once applied their resources to the development of a material which should be free from objection, and which should be reliable. They aimed at the following points:—  
1. It must be capable of being applied to every kind of stone, without disfiguring it, and, if possible, without altering its appearance. 2. It must be incapable of chemical combination with the stone, for experience had shown that unless this condition was complied with the effect would be useless. 3. It must last at least ten years. 4. It must be easy of application. 5. It must be cheap enough for everyday use. These qualifications have all been attained, for the stone liquid is so simple that anyone can apply it, it is so cheap that everyone can use it, and it can be applied to stone, marble, or brickwork with equally good result.

The third qualification required a most important test—the test of time. Messrs. N. C. Szerelmey & Co. were willing to wait a ten years' public experience of it amongst their customers before claiming success. That period having elapsed, they wrote to their customers, asking for their verdict. Their reports are contained in a lengthy list. In every case it had given absolute satisfaction, and done everything that was expected of it. These reports include the names of several prominent architects.

The Szerelmey stone liquid under notice is a nearly transparent fluid, having a specific gravity somewhat less than that of water. When newly applied it gives the appearance of dampness. This is caused by a film which the liquid leaves upon the surface. In time this film recedes within the stone itself, where it forms an impermeable diaphragm. It is not, of course, possible to say how far it enters the stone, but probably never more than one-eighth of an inch. There is thus a surface of the stone exposed to the atmosphere which is found to harden in the natural way, but which never scales.

The action of moisture, necessary to produce scaling, is prevented by the impervious diaphragm.

Every colour of stone can be treated with the same liquid; and Messrs. N. C. Szerelmey & Co.'s offices at Mowbray House, Victoria Embankment, London, E.C., would be well worth a visit to inspect the numerous specimens of stone, bricks, &c., treated.

The important subject we have raised by this notice we hope will lead to our readers taking an interest in an invention which is open to their inspection and test.

### REGISTRATION OF PLUMBERS.

At the City Guilds Institute, Finsbury, last Saturday, an examination was held under the auspices of the Plumbers' Company for certificates of registration. The practical examination included various branches of leadwork, and the theoretical questions relating to the several subjects of plumbers' materials, house fittings, and sanitation. Plumbers attended from several districts of Middlesex, Surrey, and Yorkshire. The examiners were Mr. Charles Hudson, assistant chairman of the Registration Committee, and Messrs. Clarke, Gilbert, Millis, Nurse, and Webb. Seventy-five per cent. of those attending passed the full examination.

The system instituted by the Plumbers' Company in 1888 has, through the instrumentality of the Manchester and Salford Sanitary Association, been introduced into that city and district, and is now fully organised. The Council, of which Mr. John Holden, F.R.I.B.A., is chairman, and Mr. Fred Scott, secretary, consists of representatives in equal numbers of the public, master plumbers, and operative plumbers. The representatives of the public, appointed at a public meeting in the Town Hall, include the Mayors of Manchester and Salford, chairmen of the Health Committees, city and borough engineers, medical officers of health, the chairman and secretary of the Sanitary Association, architects, builders, and sanitary engineers. The masters and operatives also in public meeting selected their own representatives, and the Council are now prepared to carry out the work of registration in Manchester and Salford and a district of about thirty miles radius, except on the Liverpool side, where the district will extend only to Warrington, Liverpool being another centre. At the last meeting of the Council the first batch of applications were passed for nomination in the Plumbers' Company.

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## THEATRE EXITS AND FIRE RISKS.

A GENERAL meeting of the renters or debenture holders in Drury Lane Theatre was held on Thursday last week in the saloon of the theatre, Major Sharpe presiding. The report of the architect stated that improvements of a considerable nature had been made with regard to the means of exit. The exits were now so numerous and conveniently situated that visitors might feel the utmost possible security. Before the meeting closed it was suggested that the electric light should be introduced into the theatre.

THE cost of the improvements just completed at the Prince of Wales's Theatre, Birmingham, will be over 2,000/. The auditorium has now been entirely cut off from the stage. A brick wall of exceptional thickness extends from the foundations to the roof behind the line of the proscenium arch, and the archway can be closed in ten seconds by a double asbestos curtain, with an iron framework weighing eight tons. Those dressing-rooms which extend beneath the pit and the boxes on the O.P. side are in like manner separated from the theatre by concrete walls, floors, and roofs, braced by short girders. The auditorium itself may now be emptied without haste in a very few minutes. The exits from the different parts of the house have been improved and additional ones constructed. From the gallery are two staircases, one of which, however, strongly built of stone and unusually broad, is much better than the other, and has only the demerit of emptying into the broad exit from the pit. All the doors are kept unlocked, open outwards, and, once thrown wide, secure themselves by a spring attachment from closing again. Behind the scenes the greatest changes have been made. The dressing-rooms, like that portion of the building to which the public is admitted, are separated by a brick wall and asbestos doors from the stage, and are served by an admirable staircase. Their floors are of concrete, laid with wooden blocks, and their fittings are coated with asbestos paint. Formerly the suite of dressing-rooms on the prompt side was not only a portion of the stage, and subject to almost immediate invasion by fire, but was served only by a narrow spiral staircase of wood. In the flies the gas-jets are covered with wire-guards, and the use of naked torches in lighting them has been discarded in favour of a system of automatic illumination. There is also a most elaborate provision of fire-extinguishing apparatus, and the scene-shifters are subjected to regular drills; also there is a direct telephonic communication with the Central Fire Station. The decoration

has been done by Mr. J. Seers, of Broad Street. The architect is Mr. W. Jenkins, of Bennett's Hill. The builder is Mr. Loud, of Selly Oak.

The Theatre Royal, Halifax, is to be reopened on the 20th inst. The alterations have been made from plans prepared by Messrs. Horsfall & Williams, Halifax, and Messrs. Milnes & France, Bradford, and will be carried out jointly by the two firms, under the superintendence of Mr. Williams. The dress-circle will be materially altered—the portion known as the back boxes will be swept away and converted into a crush room about 13 feet by 18 feet, out of which two doors will give access to the circle, which will be carried further back, and furnish extra accommodation. The present main entrance to the theatre will be used for this part of the house exclusively, and a new fireproof concrete staircase from the opposite side of the crush room will give access to the street in case of emergency. A new entrance is making for the pit, to run parallel with the one for the boxes, but divided by a thick brick wall, and the exit on the Shakespeare Street side will be cut off from the gallery entrance by a double brick wall, so the people from these parts will not meet until reaching the street. The new exit door on the Horton Street side will be considerably improved. The gallery is receiving particular attention—the present wood staircase is to be replaced by one of concrete, fireproof—and an exit is to be constructed at a low level on the Horton Street side, from which will run a commodious iron staircase. An iron balcony is also to be erected in front of the building, access being gained from the three windows at the top of the gallery. The stage is to be entirely separated from the auditorium by a 15-inch brick wall, extending from 12 feet below the stage to above the roof, the proscenium being closed by a double iron curtain, worked by hydraulic power, made by Messrs. Elkanah Hoyle & Sons. An iron fire-escape is to be constructed for the stage, and extra dressing-rooms provided.

FETES AT ANTWERP.—In commemoration of the freedom of the Scheldt, fetes will be held at Antwerp from Saturday, August 11, throughout the following week. On the night of Tuesday, the 14th inst., a Venetian water fête upon the Scheldt has been organised by the Chamber of Commerce of Antwerp, comprising a naval procession and general illuminations of the river. In connection with these celebrations return tickets have been arranged by the Great Eastern Railway at reduced rates *via* the Harwich route, available from the opening to the close of the festival.

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## WATER SUPPLY WORKS.

ON Friday last the completion of the new storage reservoir of the Grand Junction Waterworks was formally celebrated. The company, whose present works are situated at Hampton, Kew Bridge, Ealing, Campden Hill, Kensington, and Kilburn, has a district of supply extending from Pall Mall to Sunbury, and the population supplied with water by the company numbers nearly half a million. The number of houses supplied is nearly 55,000, of which 42,000 receive constant service, and the quantity of water annually filtered and pumped into the district amounts to 6,300,000,000 gallons. The original supply of water for this company, which was incorporated in 1811, was taken from the Grand Junction Canal at Paddington. In the year 1819 the source of supply was removed to the river Thames at Chelsea; in 1835 it was taken higher up the Thames to Kew Bridge; and in 1852 it was again removed to the river Thames at Hampton. The storage reservoir is situated on an eminence called Mount Park Hill, and is designed to act as a reserve to meet any emergency caused by excessive drought, large fires, or other contingencies. Its surface extends over six acres, and, with a depth of 45 feet, it will contain 51,000,000 gallons of filtered water. It is lined with Portland cement concrete, and the slopes are paved with vitrified brick. The level of top water is 193½ feet above Ordnance datum, or more than 100 feet above the level of the ground of the Marble Arch, and the water will be supplied from the works at Kew Bridge through a line of pipes 30 inches in diameter. Messrs. John Aird & Sons were the contractors for the work.

On the same day was also inaugurated the new reservoir constructed on Addington Hills for the Corporation of Croydon. Messrs. Kirk, Knight & Co., of Sleaford, carried out the works from plans by Mr. Walker, borough engineer. The water is obtained from a well situate three-quarters of a mile south of Addington village. It is sunk in the chalk to a depth of 200 feet, the surface being 318 feet above sea-level. The storage capacity of the headings and the lower part of the well is about 502,000 gallons. A compound beam-engine of the Woolf type is employed to raise the water, its delivering power being 77,760 gallons per hour. The reservoir will hold 5,000,000 gallons. Its overflow level is 465 feet above sea-level. The total length of mains laid is about 13¼ miles. Last year the consumption of water averaged 2,255,327 gallons per diem. The district for domestic supply is the area of the borough within a two-mile radius from the Town Hall, with about 75,000

people. Luncheon was afterwards served. After the customary loyal toasts, the Mayor went at length into the work done by the Corporation, and spoke of the open spaces and recreation grounds, of the fact that they had learned the secret of ventilating their sewers above the people's heads instead of under their noses, how they had spent 27,700*l.* improving their foot-paths, purchased a freehold farm for irrigation purposes at a cost of 52,000*l.*, widened bridges, spent 3,500*l.* on baths, and how, although they had expended in all 147,000*l.*, the rates were lower than in the days of the old local board.

## THE SANITARY REGISTRATION OF BUILDINGS.

THE Bill dealing with the better sanitation of dwelling-houses, schools, colleges, hospitals, factories, workshops, hotels, lodging-houses, and other buildings within the United Kingdom, prepared and brought into the House of Commons by Dr. Farquharson, Sir Henry Roscoe, Sir Guyer Hunter, and Dr. Cameron, entirely meets with our sympathy, says the *Lancet*, in so far as its general aims and principles are concerned. But we fear that in some of its details it will be found open to objection. The compulsory establishment of "sanitary registration authorities" throughout the kingdom is a most important step, and calls, above all things, for a competent staff of experts in order that justice may be done to the public. An attempt is made to secure such a staff by the initiation of examinations under certain bodies. These include the Royal Institute of British Architects, the Institution of Civil Engineers, the Institute of Architects in Ireland, the Association of Municipal and Sanitary Engineers and Surveyors, and the Surveyors' Institution; but it will be most unfortunate if all these bodies become competing authorities for the issue of certificates in sanitary practice. And if anything is done in the matter an effort should be made to secure a combination of these authorities for the purpose of a single certificate having uniform value. But pending the inauguration of the examinations in question, the Local Government Board are to be required to grant certificates to a body of individuals, some of whom are not really competent, and who will acquire the right to hold a Government testimonial of their fitness merely because they happen at the time of the passing of the Act to hold a certain office, which they have secured without any evidence of their competency to fulfil it. We more than doubt whether the Local Government Board will consent to be placed

## THE FIRE AT THE GRAND THEATRE.

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## RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIR.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 32 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIR.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly,

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in such an invidious position; and we are inclined to think that, having regard to the small number of surveyors, &c., who are well grounded in sanitary knowledge, the Bill should have been tentative in the first instance.

#### PURIFICATION OF THE THAMES.

ALLUDING to a notice in the *Times* of July 26 of a visit by the Society of Engineers and experts to the new sewage-precipitating works for the northern outfall at Barking, Sir Robert Rawlinson writes:—The notice is headed, "The Purification of the Thames." My experience would compel me to substitute the following heading, "For the Continued Pollution of the Thames." The Greeks are reported to have said, "Whom the gods intend to destroy they drive mad." With regard to this sewage-purification question, the Metropolitan Board have on this question gone mad from their beginning, the works they are now prosecuting being the ultimate passion of madness. When the Metropolitan Board was established Parliament put upon them, as its prime duty, the purification of the river Thames, and to this end at first they consulted many of the most eminent chemists of the day as to the use of chemicals for precipitation of the solids and purification of the fluids. To make a long story short, the common results were that no chemicals purified sewage; that the best left seven-eighths of the salts of sewage in the clarified water, *plus* some of the chemicals; and that the clarified fluid, when passed into small streams or rivers, would ferment, become putrid and offensive—these being the results, whatever chemicals or precipitants were used. In some small places, where there is a stream having a swift current, and it is in the country, chemical clarification, when well attended to, is allowed. In other cases, chemical treatment, with subsequent land filtration, is allowed. But at Liverpool the great tidal estuary receives and disperses the whole of the crude sewage. The case of London is exceptional. An enormous population, fully sewered, and having not less than 1 million water-closets or soil-pans, from which excreta to the extent of 12½ millions of pounds every day is poured into the sewers and into the river at a point some ten or twelve miles below London, and some fifty miles from the sea, the tides flowing up and down past the great sewage outfalls and past London each day, constitute a vast difference.

But to the conditions imposed from the first on the Metropolitan Board by Parliament. These were, in short, to remove the

entire volume of sewage from the Thames in such a manner as should effectually free the metropolis from its sewage day by day, and the river Thames from pollution, neither of which has this most unfortunate Board done. At the outset of their work there were many projectors in the field, professing to have at command modes of dealing with sewage so as to purify it at a great profit. There were also persons who professed themselves willing to take the entire volume of sewage down to the Maplin Sands, and there to use it, pouring any surplus into the sea. Surveys and plans were made for sewage conduits to convey the entire volume of sewage, north and south, to land or to the sea, at no cost to the Metropolitan Board. These baits proved so tempting that the Board allowed itself to be turned from its true duty and to try, by negotiating with outside parties, to relieve itself from the obligation for which it was principally called into existence, namely, to embank the river through the metropolis, complete the main drainage, and purify the river, this latter being the crowning work, without which the other expenditures would be in a great degree waste of money.

Before embarking in these enormous works now on hand, the Board cannot have informed itself of the position of the sewage question at this day. I must assume that they do not know what good progress has been made in the use of sewage when applied to land in broad irrigation in England and on the Continent, where the entire sewage of the town is disposed of year by year and all the year round so as not to be a nuisance. There are sewage farms in England sufficient to convince any open-minded persons that where land can be acquired for broad irrigation the problem of what to do with sewage is solved. But on a very large scale, out of England, there is Berlin, where, by pumping, sewage is distributed all the year round over some thousands of acres of land with perfect success, and that which is done for Berlin may be done for London.

Between the metropolitan sewage outfalls and the sea sewage conduits may traverse fifty miles of agricultural land, opening out from 50,000 to 100,000 acres of land hungry for sewage, which, if applied, would find employment for thousands of labourers, and add fivefold to the productiveness of the soil.

The Metropolitan Board say that they are carrying out the recommendations of Lord Bramwell's Commission. I say they are not, and I am in a position to say that I know they are not. But, apart from all dispute and argument, time will show that the 50 acres of sludge-tanks and works will be 50 acres of an abominable nuisance; that the mud barges will be costly

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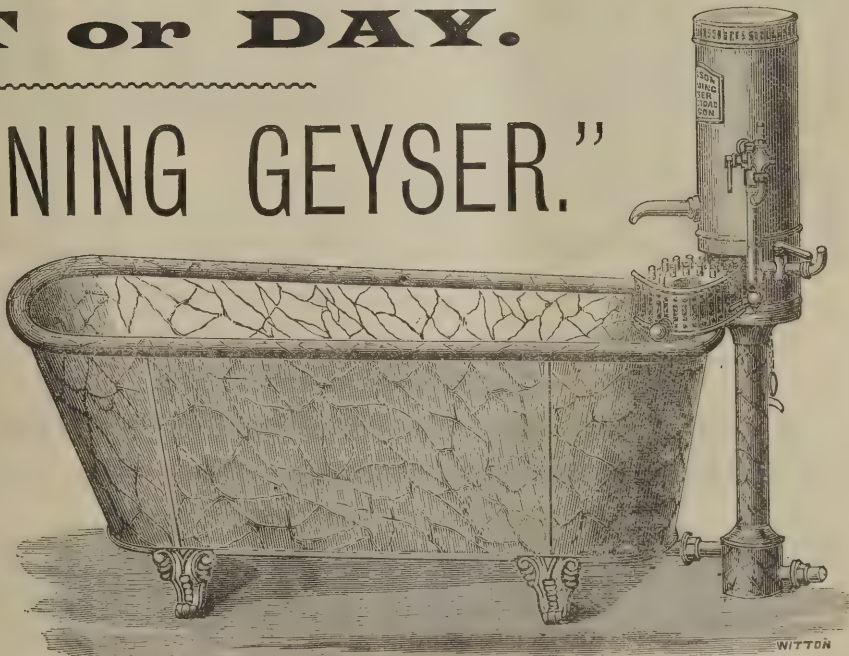
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incumbrances to the river; and that the working expenses will be enormous, and all waste. The sewage of the metropolis cannot be less than 200 million gallons per day. The new works are to treat 90 millions of gallons per day. What is to be done with the 110 millions over and above? If this moribund Board had been well advised it would not so recklessly have plunged head over ears into the present costly mess, in the face of all previous warnings and of the recommendation of the last Royal Commission, especially appointed to take evidence and to report upon this notoriously vexed question.

How the Government can have permitted it is difficult to imagine. Recent inquiries and revelations must, however, show that wisdom does not dwell in Spring Gardens.

#### EXTENSIVE SALE OF BUILDING SITES AT FRINTON.

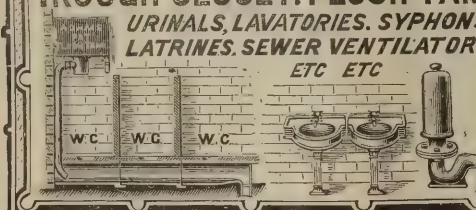
ON Monday, the 30th ult., Mr. Richard J. Collier, of Milner's Buildings, Finsbury Pavement, conducted a large sale of freehold building land at Frinton, the new seaside resort on the east coast, situated between Clacton-on-Sea and Walton-on-the-Naze, at which an estate of upwards of 100 acres in extent has been purchased by the Marine and General Land, Building and Investment Company, who have laid out the estate for building upon, several new roads having been formed, together with an esplanade facing the sea upwards of a mile and a half in length, in front of which is a spacious turfed promenade running the entire length of the esplanade. The estate stands upon high ground, considerably above the beach or shore, with a commanding view of the German Ocean. Already several high-class houses have been erected along the esplanade frontage, and also in several of the new roads, whilst building is now going forward on different parts of the estate. The Tendring Hundred Water Company, whose district includes Walton-on-the-Naze, Clacton, and several surrounding parishes, have nearly completed the laying down of water-mains along all the newly-formed roads, and amongst other works to be carried out is an ornamental pier, and also a sea wall running the full length of the cliffs and esplanade. A special train from Liverpool Street took a numerous party to Frinton to attend the sale, and the rain having cleared off, with a charming sunshine, the visitors, on arriving at their destination, inspected the newly-formed marine locality, large numbers parading the promenade and esplanade for some hours previous

to the commencement of the sale, which took place at the recently-erected Queen's Hotel. The plots offered were ninety-seven in number, including several shop plots and a large hotel plot facing the sea. The plots submitted were all unusually large ones, varying in their frontages from 30 to 120 feet, and in depth from 100 to 170 feet. On the sale commencing, the biddings became close and spirited, and a large proportion of the plots offered were sold at prices ranging from 30% for the smaller lots to 60%, 80%, and 100% for those having a larger area. The plots on the East Cliff, facing the sea, and situated on that part of the estate described as the Crescent, having frontages of 100 feet and depths of 170 feet, were sold for 125% each. For the large hotel plot, facing the West Cliff, having frontages of 200 feet, 410% was offered, but being below the reserve was bought in at 450%. An angular plot, close to the sea, containing 3½ acres, and described as suitable for a lawn-tennis ground, was sold for 395%. The total proceeds of the day's sale amounted to 2,400%.

#### INCORPORATED TRADES OF CALTON.

THE management and administration of the properties of the ancient Barony and Incorporation of Calton were, the *Scotsman* says, formally transferred to the Edinburgh Town Council on Monday, when a meeting of the Town Council Committee took place. The meeting was presided over by Baillie Turnbull. Among the articles laid before the meeting were—(1) Ram's horn mounted as a snuff-mull, having the Incorporation arms engraved on a silver plate, and surrounded with silver bands bearing the names of the Conveners since 1810, when the horn was presented to the Incorporation by Mr. Simon Cunningham; (2) large and handsome table snuff-box, in silver, with gold plates on top, bearing the City arms, &c., an inscription on the box intimating that it was presented for the use of the Con- vener, and as a mark of respect, on occasion of the formal opening of the Convening Hall, on April 15, 1819; and (3) the Seal of the Incorporation. In this connection mention was made of the following properties now in the Convening Rooms as worthy of the attention of the Town Council:—1, Lord Balmerino's chair, a fine specimen of the antique, in perfect preservation and order; and 2, the three official chairs, in Spanish mahogany, having the arms of the various trades beautifully carved by the late Mr. John Steell. Although in one aspect the proceedings involved the handing over of pro-

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perties of comparatively little importance, consisting chiefly of the burying-grounds in Waterloo Place and in Regent Road and the Convening Hall and Rooms, yet the transaction is significant as the closing act in the history of an institution venerable by antiquity, and surrounded by many interesting associations. The Incorporation was originated by Lord Balmerino, the owner of the estate and barony of Calton or Caldtoun, and dated back to 1631. For many long years the community living within the bounds of the barony led an isolated existence as a barnacle burgh attached by locality and interests to the city—exercising rigidly the rights of exclusive trading, and managing all their own affairs (municipal, police and parochial) by means of the Baron Baillie and the officials of the Incorporation; but the sweeping away of a large number of dwelling-houses and other buildings in 1814 to make way for the new Calton Road and Bridge, the change in public feeling consequent on the advance of Liberal notions, and, finally, the passing of the Act of Parliament of 1846 repealing the right of exclusive trading, wrought a great change in the Incorporation, and the body has since existed very much as a territorial mutual benefit society, which during the whole course of its career, as well as in its closing years, has conferred many and substantial benefits on its members, their widows and children. The membership having become all but extinct, and the last widow having dropped off the roll, it became necessary for the Incorporation to take steps for transferring the management and administration to some body having perpetual succession, and the Town Council are now taking over all its properties and becoming responsible for its obligations. The circumstance of the grounds having been so long used for cemetery purposes demands their suitable maintenance and upkeep in all time coming. The hall and grounds occupy prominent positions, and form important architectural features in the approach to the city from the east, and they cannot be in better hands, as securing the amenity of the city, that in the custody of the Town Council. There is, too, a peculiar fitness in the properties falling into the hands of the Town Council, the superiors of the old barony and proprietors of the lands of Calton, which they purchased in 1724 from John, Lord Balmerino, and James, Master of Balmerino.

As many citizens and others have private tombs and spaces and are otherwise interested in the grounds, it will be satisfactory for them to know that their rights of interment are in no way interfered with; their case formed one of the special points stipulated for by the Incorporation. The following

names may be taken as representatives of the several classes of the now silent denizens of the grounds:—Of civic dignitaries there are Lord Provosts Allan, Alexander Henderson, and Kincaid Mackenzie, besides a long line of bailies, town councillors, and municipal functionaries; John Sinclair, town clerk of Edinburgh, and clerk to the ancient barony of Calton; Isaac Bayley, of Manuel, long clerk to Heriot's Hospital; and Archie Campbell, principal city officer—a figure of such importance in his day as to be immortalised in "Kay's Portraits." The Church of Scotland is represented by Dr. David Ritchie, of St. Andrew's Church, and Professor of Logic in the University; the Free Church by Dr. Candlish (who is interred in his father's tomb in the old ground); the Episcopal Church by Bishop Teviot; the United Presbyterians by Dr. John Brown and others; and the Roman Catholics by their tomb in the new ground, in which are interred the Rev. Alexander Gordon, a man of great erudition, and others of their clergy. Law and Justice are represented by the following Lords of Session:—Sir William Miller, of Glenlee, and Lords Gillies, Ivory, and Adam Gifford. Medicine has some illustrious names—Professor Sir Robert Christison (interred in the tomb of his father, Professor of Humanity in the University), Dr. James Begbie, Andrew Fyfe, surgeon, and his son Dr. Andrew Fyfe, Professor of Chemistry; Dr. Adam Warden, Aurist to the Queen; Dr. George Wilson, Lecturer on Chemistry and Professor of Technology; and Professor Dick, founder of Dick's Royal Veterinary College, who, and his father before him, were members of the Incorporation. Literature and art embraces the names of Baron Hume, the historian; Dr. John Brown, author of "Rab," &c.; Archibald Constable and Blackwood, publishers; David Allan, historical painter; and Robert Stevenson, C.E. Histrionic art is supported by the names of William Woods, who at the beginning of this century was the leading and favourite actor on the Edinburgh stage; and Charles Mackay, who, as his stone indicates, was better known as "Bailie Nicol Jarvie." There is a strong list of architects, and several of them were members of the Incorporation—Robert Burn, David Bryce, David Nisbet, John Neill, Robert and Richard Dickson, Lewis Alexander Wallace, and Charles Macgibbon. The profession of arms is upheld by many noble sons of old Edinburgh who distinguished themselves in the various branches of the service.

Their good swords are all rust,  
Their bodies gone to dust,  
Their souls are with the saints, we trust.

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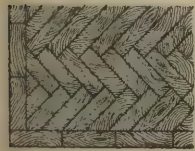
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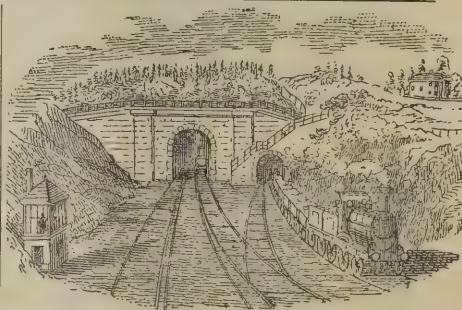
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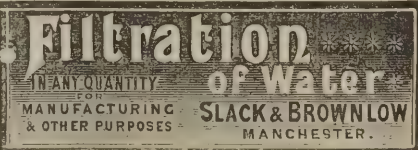
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## BREWERY ENGINEERING.

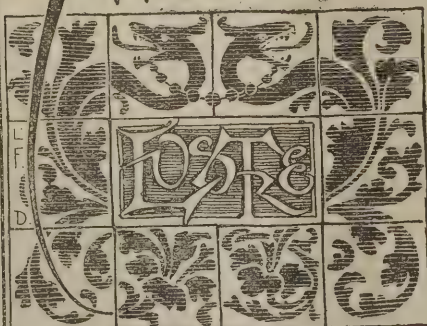
At the Congress of the Institution of Mechanical Engineers in Dublin last week, Mr. Samuel Geoghegan, engineer to Guinness's Brewery, read a paper on the tramways and rolling stock in the establishment. As the business of the establishment increased, it became necessary to extend the premises, and the ground which lay between James's Street and the Liffey was purchased in 1873 with the view of bringing the brewery into direct communication with the port by means of steam barges. The traffic, not only within the old and new premises, but also between them and between the new premises and the river and the railway terminus, was effected by the construction of a double system of tramways, namely, a tramway of 5 feet 3 inches gauge, the same as the Irish railways, for communicating with them from the new premises, and a tramway of 22-inch gauge for the work within the brewery, and for communication between the higher and lower premises. This narrow-gauge tramway and the rolling stock for working it form the special subject of the present paper. The working of the broad-gauge waggons with a narrow-gauge engine, developed by the requirements of the traffic, is novel, and may be considered under the four following heads:—1. Design of line; gradients and curves. 2. Permanent way; points and crossings. 3. Rolling stock; locomotives, waggons, and haulage trucks. 4. Traffic and signals. In designing the line the author set himself to comply with the following conditions:—That as far as possible all the traffic within the brewery should be worked by steam power; that the levels should be connected by gradients not exceeding 1 in 40, and with as easy curves as practicable; that the weight of the engines should be as great as could be obtained upon their limited wheel-base, as the loads to be hauled were considerable, and in addition the gradients were heavy, the curves sharp, and the wheels small; and that the rolling stock should be of as great a capacity as a width of 5 feet and a headway of 6 feet would admit. The first difficulty was the difference of level to be surmounted within a limited area. To meet this a hydraulic lift had at first been employed, by which the waggons were raised or lowered, one by one, between the two levels. This was a slow and costly process, involving the separation and making up again of the trains. A great advantage would accrue from connecting the two levels, without exceeding the set gradient of 1 in 40. To meet these conditions a spiral tunnel might be constructed, and proved to be perfectly feasible. The height of the tunnel is 7 feet 3 inches

from the rails, the width 7 feet 10 inches, and the thickness of arch 18 inches. A short connecting tunnel was formed at the bottom by driving a heading and lining with brickwork in the usual way.

On issuing from the tunnel at the top the line takes a short stretch to the left, forming a junction with other lines; and then returns, passing again over the tunnel in the open, thus forming a third lap; and finally runs out on the level of the brewery yard about 35 feet above the rail level at the bottom entrance to the tunnel. The remaining 15 feet of rise, from the quay up to the bottom of the spiral, is effected by means of a zigzag incline from the quay up to the mill stream. This road crosses the mill stream twice, continuing the incline by a small brick viaduct up to the bridge over Cooke's Lane. The bridge is on the same level as the entrance to the tunnel under James's Street. For the sake of quickness and convenience in working the line is constructed with curves, no points being used; so that a train can be run from the lowest to the highest level, and over the whole extent of the premises, without shunting or changing the engine to the other end of the train. On the small line the permanent way has undergone some changes, more particularly at those parts where it has been laid with rails above the ground level, which has been done at places where there is not any horse traffic or much other traffic. The first rails were as light as 16 lbs. per yard, and the weight has since been increased to 46 lbs. per yard. In the laying out of the line, triangles have been so worked in as to form easy means of turning a train whenever required, without uncoupling. Owing to the small radii of the curves in the triangles, very little ground space is occupied for this purpose. Both narrow and broad-gauge roads are now entirely without turntables, with the exception of one only, which is used for placing the engines and waggons over their pits in the running shed. As there is horse traffic over the broad-gauge rails on which the railway waggons run, these rails are grooved, and the waggons run on the flanges of the wheels in the grooves instead of on the tread, thus keeping the tread of the wheel well clear of the pavement and avoiding the use of a guard-rail.

The total length of the line is about four and a half miles. At first the points and crossings were made out of the rails themselves, as on the broad-gauge railway lines. But experience soon demonstrated that, in order to make a good permanent job, they must be something more than a mere reduction in proportion from the sections used on broad-gauge lines.

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The present rolling stock comprises nine locomotives and 177 waggons. The first locomotive ordered weighed only about two tons, and is suitable only for light work. It has the defect that, owing to the gearing being so close to the ground, it is very difficult to keep in order when working full time. Geared engines were then procured, weighing about five tons, and, owing to their increased hauling power, were found very useful; but the absence of springs rendered them costly in repairs and hard on the road. They were also slow in speed, and somewhat troublesome in starting. The next class, weighing six tons, and having outside cylinders, proved better adapted to the traffic. They have circular ends for foot-plates, and have also water tanks for condensing the exhaust steam. The motion being all outside, made it very accessible for cleaning and repair; but being so near the ground it got very dirty, and the wear on this and on the horn-plates from the same cause necessitated very frequent adjustment. The difficulty in finding an engine suitable for the duties required was overcome by designing an entirely new form of engine, which should combine the best points of each and avoid their defects. A good arrangement with springs could be made by placing the cylinders and crank-shaft horizontally above the boiler, and the motion could be communicated through vertical coupling-rods from the crank-shaft to the main driving axle, the upper and lower axle boxes being connected together by a link which would keep the centres at a fixed distance.

In the carrying out of this design sundry difficulties presented themselves. The first of these was the connecting together of the upper and lower crank-pins in such a way as to allow for the oscillation of the two shafts due to defect in the road, without interfering with the true bearing of the brasses on their respective pins. The question arose how much oscillation it would be necessary to allow for; and it was considered that a play of  $\frac{3}{4}$  inch would be sufficient to allow. In the inclined position due to this amount of play, it is astonishing how much out of line the two shafts appear. To overcome this difficulty the author adopted the expedient of thinning down the ends of the coupling-rods near the crank-pins, so as to allow of their springing, while at the same time making them sufficiently broad to retain the necessary sectional area for strength. The second difficulty was the adjustment required for the wear that was likely to take place in the top axle-boxes, owing to the thrust of the vertical coupling-rods, in addition to that due to the forward and backward thrust of the pistons. This has been overcome by the arrangement of brasses. As

the vertical and horizontal thrusts, and consequent wear, are on the whole about the same, the side cod-pieces are made to a right angle, so that when adjusted they close in the bearings equally both vertically and horizontally. A third difficulty was how to avoid the use of horn-block guides, which had been found to be a constant source of trouble and expense. The pull of the engine, the side oscillation, and the thrust of brake-blocks had all to be provided for. The arrangement adopted has been found to get over this difficulty. The axle-boxes of the carrying wheels do not slide in horn plates in the usual way, but have vertical play to the extent that the spring-frame will allow; and the brass linings are turned as parts of a cylinder, for allowing the axles to adjust themselves in case of an unequal lift on either side of the engine. This bogey has to transmit the pull of the drawbar only, and not the forward and backward pressures from the pistons.

A manufacturing firm is differently situated from a public carrying company in having to provide only waggons adapted to its own requirements, which are more clearly defined and more easily ascertained than when the wants of every description of traffic have to be met. In the case of an existing establishment where the old buildings were not laid out for such a contingency as a railway, the necessarily sharp curves and narrow openings, and probably low headways, will very much affect the design of rolling stock. In the present instance 5 feet in width, 8 feet in length, and 6 feet in height, on a wheel base of 3 feet, were the limits not to be exceeded with the four-wheel tip waggons. The object of this arrangement is to get as large a body as possible, and at the same time a sufficiently great angle for the complete discharge of the load. When loading with materials to be shovelled from the ground level, the fastenings are pulled out of the catches by the chain at the side opposite to the loading; and a slight additional pull causes the rollers to rotate, which they readily do, being urged by the extra weight of the upper part of the body. For discharging a load it is only necessary to pull the chains attached to the spring catches until the body is released, and then to give it a slight tilt; and as the centre of gravity is high, the body will tip itself over until the springs are caught by the top of the frames, in which position the sloping side of the waggon gives a sufficient angle of discharge for all brewery materials or products. In addition to these four-wheel waggons for carrying in bulk, waggons are also required for the larger materials which could not be accommodated on four wheels with such a short base. For this traffic a platform waggon mounted on two

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bogey frames is used. Its weight is about 28 cwt. The bogey is made simply of two longitudinal timbers resting on the axle-boxes, with a piece of transverse plate bolted across, to which is rivetted the centre carrying the platform beams. It was thought advisable to put in side rollers, so that in case of excessive load on either side the roller will come into play. The coupling bars are at the same height, and the same in every respect as those used on the four-wheel waggons, and are fixed to the bogeys and not to the body of the waggon.

The haulage truck is an apparatus designed to enable the existing small engines to be employed, thus saving the expense of two shunting locomotives of the 5-feet 3-inch Irish gauge, and avoiding the need of a second shed. It was considered that for the slow speed required one of the small locomotives would be quite equal to the work to be done, and thus far the plan is found to answer its purpose well. The engine is lifted by hydraulic power upon a broad-gauge haulage truck having four wheels, on which the wheels of the engine rest; and on the counter shafts carrying these wheels are pinions, gearing into spur wheels on the shafts of the truck carrying wheels. The total traffic at present is about 1,500 tons per day. In most cases the roads have been laid out at the brewery with the view of working in circuits.

Signals are scarcely needed with such slow speeds and short runs, and are used in only two places, namely, a little outside each end of the spiral tunnel. The following will explain the working:—First, should a driver entering at one end find that the lever at his end is over with the weight looking towards him, he knows that the line is blocked, and he waits till the driver who has blocked it clears it again, which is done on leaving the opposite end from that at which he entered by catching the hanging rope attached to the wire. The pulling of this stretched wire, which is done while the train is in motion, will pull over the blocking lever at the entering end, and will thus clear the line, which cannot be effected by pulling at the lever itself at the outgoing end of the line. The driver who has been waiting then follows, having first blocked the line again himself at the entering end. Second, should a driver coming to the signal find that the lever is apparently in "line-clear" position, he tries to block it; but should he be unable to pull it over, he knows that there is some one coming in the opposite direction who has thrown the opposite lever over to block. He then backs into a siding to get out of the way of the driver coming in the opposite direction, who when he comes to the rope hanging from the stretched wire catches it and so clears the line.

The first driver then throws his own lever over to block and proceeds. Third, should two drivers come to the signals at the same time, one at each end of the line, then whoever pulls his lever over first has got the road to himself. As the men know that their situations, and perhaps their lives, depend on the regular working of the signals, there is found to be no trouble with them. In the case of local traffic, like that of the cask-washing and the removal of grains and malt, a conductor accompanies the train, shifting the points and signalling with the flag; and when passing through the public thoroughfares he carries out the requirements of the Board of Trade and other public authorities.

#### EMPLOYERS' LIABILITY.

AN action has been brought by a workman named Pearson, of Hoole, in the Chester County Court, against Messrs. Neill & Sons, of Manchester, contractors, who had the contract for building the new goods station at Chester. In November last the workmen were engaged excavating foundations, and in order to keep the banks from collapsing they drove in piles. At first the piles were driven in with a hammer, but as this destroyed the timber iron caps called "dollys," to fit on top of the planks to prevent them being damaged while being driven, were used. Four men were engaged at the pile-driving, two being in the hole and the other two on a platform, the one striking and the other holding the "dolly" on to the top of the post. On the occasion in question the plaintiff was in the hole, and the workman had struck a blow at the post and was raising the mallet again when he knocked a "dolly" off the next post, and it fell on Pearson, who sustained such injuries that he was still suffering from nervous shock. After the accident the defendants had a rope fastened to the "dollys," so that if they were knocked off the top of the posts they would not fall more than a yard. The Judge said it would be a very dangerous thing to lay down that, because the defendants took steps to prevent a recurrence of the accident, they thus admitted their liability. The machinery was undoubtedly defective, because fastening a rope to the "dolly" made it effective. The minds of the employers were open to the dangerous nature of the plant, because they gave orders that the "dollys" were to be held on while the post was being driven, on pain of instant dismissal of the workmen. He therefore thought there was a defect in the machinery, and he thought it involved negligence; therefore

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he should give judgment against the employers for 75% and costs, and stay execution for a month on payment of 10% to the workman.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

10876. William Hardcastle, for "Attaching lines, cords, or chains to window-sashes, shutters, and lifts." July 27, 1888.  
10880. James Gush, for "Improvements in the method of fixing sliding windows in their casements to facilitate cleaning from the inside." July 27, 1888.  
10960. Edw. Tippell Newton, for "Improvements in and relating to surveying and levelling instruments." July 28, 1888.  
10990. Charles Shewbrooks, for "Improvements in the construction of roofing tiles." July 30, 1888.  
11001. Sidney Turner, for "An improved instrument and apparatus for use in the mechanical reproduction of writing, drawings, and other delineations." July 30, 1888.  
11019. Walker Moseley, for "Improvements in electric bells." July 30, 1888.  
11027. Robert Muir Petrie, for "An improvement connected with draw and push bolts for furniture, doors, windows, and the like." July 30, 1888.  
11029. Ann Knevet, for "Improved apparatus to be used in connection with domestic firegrates." July 31, 1888.  
11030. Joseph Pulsifer, for "A mechanical sketching device for artists." (Complete specification.) July 31, 1888.  
11056. George Forbes, for "An appliance for increasing the draught in boiler chimneys." July 31, 1888.  
11085. Richard Isaac Kiln and Charles Henry Kiln, for "Improvements in roller blinds and fittings therefor." July 31, 1888.  
11093. Henry Harrington Leigh, for "An improved automatic fire alarm." (Complete specification.) July 31, 1888.  
11219. William Perry and William Henry Reed, for "Improvements relating to roofs or covers for ricks and the like, to scaffolding, and to means for raising and lowering the same." August 2, 1888.

11223. Thomas Mace Cannon and James Osborn, for "Improvements in or connected with dust-pans." August 2, 1888.

PROVISIONAL SPECIFICATIONS ACCEPTED.

17261. William Henry Hazlewood, for "Improvements in blind racks." December 15, 1887.  
4787. William Rabbit, for "Improved automatic apparatus for extinguishing fire." March 29, 1888.  
5808. Archibald Campbell Ponton, Benjamin Lewin Moseley, and Crompton Chambers, for "Improvements in the manufacture of artificial marble, granite, or other stones." April 18, 1888.  
9377. Ralph Edwin James and Alfred Haley, for "Improvements in apparatus for heating water for bath and other purposes." June 27, 1888.  
9442. Mark John Lansdell, for "An improvement in the manufacture of set squares, T-squares, and other analogous appliances." June 28, 1888.  
9648. Joseph John Phillips, for "An Improved sanitary trap gully for streets and other places." July 3, 1888.  
9788. James Higson Jolly, for "Improvements in and connection with locks." July 5, 1888.  
9792. Walter Stephenson, for "Improvements in door-closing apparatus and door-checks." July 5, 1888.  
9826. Isaac Kirkbride, for "Improvements in apparatus for raising or lowering window sashes, and holding them in any desired position." July 6, 1888.  
10180. Joseph Henry de Fonseca, for "Improvements connected with water-closets and urinals." July 13, 1888.  
10308. John Turner, for "Improvements in smoke-consuming apparatus." July 16, 1888.  
10331. Robert MacIntyre, sen., for "Improvements in preventing or consuming smoke, and in economising fuel in steam boiler and other furnaces or fires, and in apparatus connected therewith." July 17, 1888.  
10467. George Holmes, for "Improvements in night latches and other spring locks." July 19, 1888.  
10473. Julius Schlesinger, for "Improvements in the manufacture of cement." July 19, 1888.  
10673. Richard Wright, for "Self-locking window-sash fastener." July 24, 1888.  
10715. William Henry Luther, for "Improvements in the construction of corrugated sheet metal for roofing, and such like purposes." July 24, 1888.

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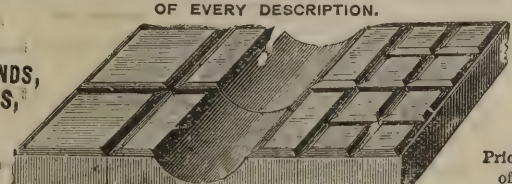
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## COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of this journal, give notice at the Patent Office in the prescribed form of such opposition.

13258. William Henry Dutton, for "Revolving door-post or other revolving posts for public buildings or theatres." September 30, 1887.

13782. George Willsmere, for "An improvement in dust-bins." October 11, 1887.

9234. John Howard Cartland, for "Improvements in the manufacture of bolts for doors and other similar purposes." June 25, 1888.

9271. Alfred Coleby Ernery & Wm. Henry Tylor, for "An improved appliance for use when jointing pipes." June 25, 1888.

9532. John Rippon, for "Improvements in the manufacture of fire-lighter." June 30, 1888.

## PATENTS SEALED, AUGUST 3, 1888.

3950. John Insham, for "Improvements in or relating to domestic fireplaces." March 16, 1888.

5591. For "Improvements relating to apparatus for operating hydraulic lifts or elevators." April 16, 1887.

7835. Joseph Sinclair Fairfax, for "Improvements in boilers, flues and furnaces, and in the plates used in constructing the same." May 28, 1887.

9398. George Edwards, for "Improvements in expanding apparatus useful for fire-escapes, scaffolding, ladders, observatories, piers, pontoon and other bridges and the like." June 11, 1887.

9694. Fredk. Wilfrid Scott Stokes, for "Improvements in the continuous manufacture and burning of cement." July 11, 1887.

10042. Alfred Julius Boulton, for "Improvements in or relating to roofs and roofing material." July 18, 1887.

10132. Henry Lewis Doulton & Mark Marshall, for "Improvements in the manufacture of spiral tubes, rods, pedestals, chimney-pots, architectural moulding and such like articles of terra-cotta or other earthenware, and in apparatus to be used for that purpose." July 19, 1887.

## ABRIDGMENTS OF SPECIFICATIONS RECENTLY PUBLISHED.

"Automatic door closer and check." No. 12291. 1887. William Frazer, 49 Oxford Road, Finsbury Park.

*Claim I.*—Combining with a concealed door-spring or check, or a door-spring and check combined of hinged or knuckle flaps, jointed as described and represented; which are firmly secured to a door and door frame, and with a knuckle snug of the one part passing through a gap of the other part. (Eight other claims follow.)

"Improvements in fireproof curtains for theatres and other buildings." No. 12328. 1887. A. Melville, Grand Theatre, Birmingham. This invention consists of composing the curtain of slag wool (silicate cotton), which is stiffened by wire netting or such-like contrivance placed either on one or both sides of the slag wool. When wire gauze is used the slag wool may be interwoven with it.

*Claim I.*—The use of slag wool (silicate cotton) in any form for fireproof curtains.

*Claim II.*—A fireproof curtain constructed of slag wool (silicate cotton) in combination with wire netting, &c.

"Draught-proof reversible window." No. 8011. 1888. W. W. Clayton, Nydd, near Ripley, Yorkshire. This invention is to prevent draught in windows where the two or more sashes are in the same vertical plane and open on pivots. When closed these sashes are fixed tightly together and to the frame by means of a rack fixed in the frame.

*Claim I.*—The way in which reversible window sashes are secured and rendered draught-proof by means of racks, as shown on drawings.

*Claim II.*—Making the sashes to shut one immediately above the other so that they are in the same vertical plane, and made damp-proof, as set forth on drawings.

*Claim III.*—The mode of holding open the sashes at any angle by means of the spring lever peg or alternative fastening, as shown on drawings.

"Improvements in ventilating apparatus." No. 8385. 1888. J. McConachy, 53 Ardgowan Street, Port Glasgow.

*Claim I.*—A ventilating panel constructed substantially as described, &c.

*Claim II.*—A ventilating shaft provided with improved ventilating panels at its upper part, and divided internally by radial partitions substantially as hereinbefore described, and as shown on fig. 4 of the accompanying drawings.

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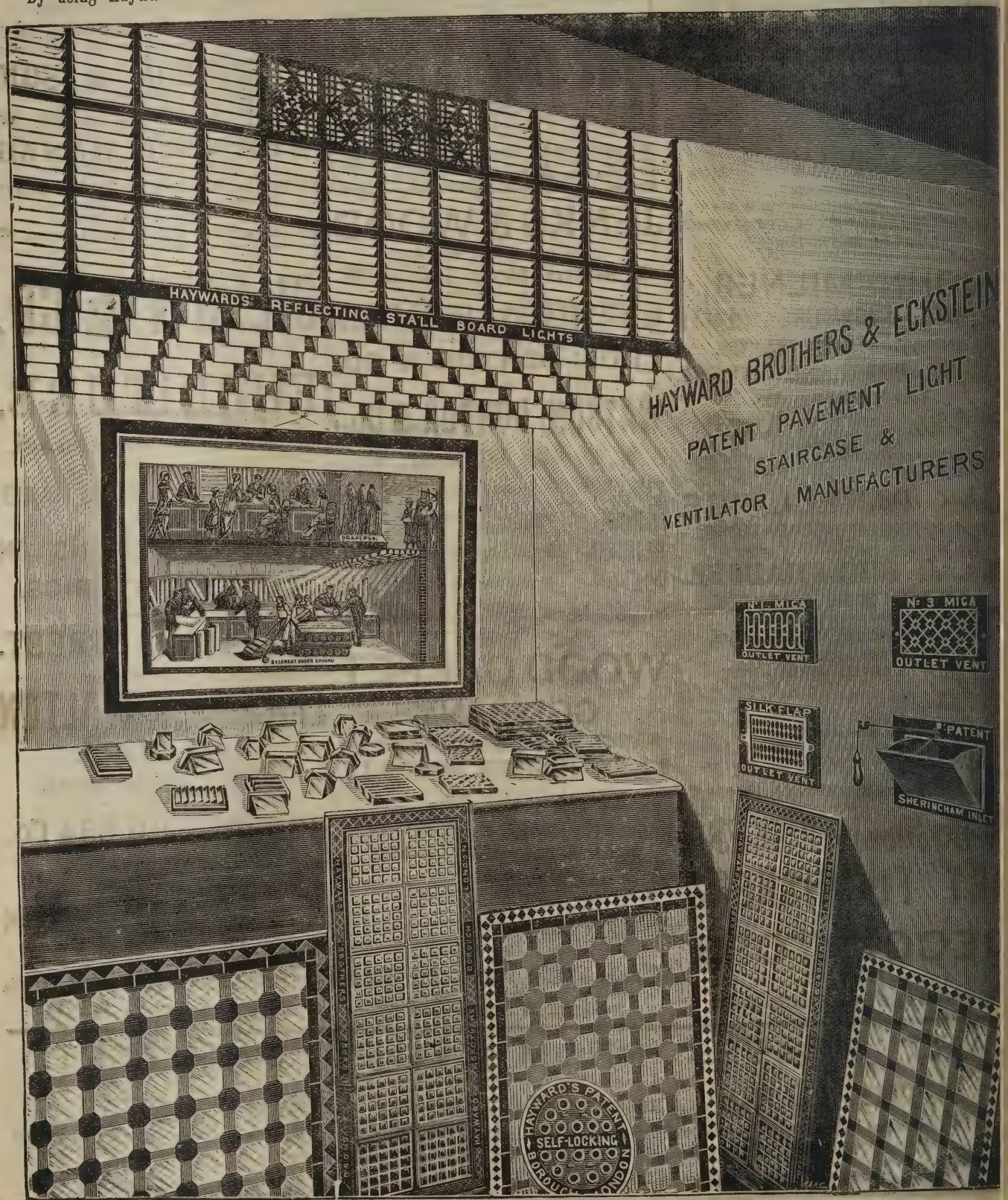
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# The Architect.

## THE WEEK.

AT last week's meeting of the Bath City Council, Mr. RADWAY, one of the councillors, stated that Major DAVIS, the city architect, had given copies of his papers on the Arms of Bath to *The Architect*. The meaning of the assertion was, we suppose, that Major DAVIS had incited this journal into opposition against the Council. The councillors may possess some means of discovering what is done inside the houses of Bath, but if Major DAVIS was observed making up a parcel of his writings for *The Architect* they never reached our office. We have a right to ask Mr. Councillor RADWAY what evidence he has of the act of Major DAVIS? Is he making use of imagination, like the men who devised the amazing Arms of Bath which Major DAVIS tried to set aside?

THE first commission given by M. LARROUMET, the new director of Fine Arts in France, was to M. PAUL SÉDILLE, the architect, and M. OLIVIER MERSON, who stands in the front rank for wall-painting. The commission is for a doorway to the section of the Exhibition of next year which will comprise examples of pottery and tapestry, from the Government factories of Sèvres, the Gobelins, and Beauvais. The gates will be designed by M. SÉDILLE, and M. MERSON will supply the studies for the figures in mosaic, symbolising the arts of tapestry and mosaic, which will be introduced at the sides.

THE two pictures by M. MUNKACSY, *Christ before Pilate* and *Christ upon Calvary*, which have gone the round of English provincial towns, are now the property of M. VANAMAKER, who has paid 20,000*l.* a piece for them. It seems an enormous price, for the scene at Calvary did not extend the reputation of the artist.

A DECISION has at last been given on the question whether clay is a mineral, and Glasgow is relieved from all fear of destruction of a part of its reservoirs. In 1871 the Corporation paid 11,000*l.* for land on which it was proposed to construct a reservoir and other works. In the conveyance all coal and other minerals are reserved to the seller. A seam of clay for bricks was worked on the neighbouring ground by the successor of the seller, and he claimed the right to follow the seam and work, in spite of any obstacle offered by the waterworks, unless he received 10,000*l.* It was necessary to take an action in the Scottish Courts, and in the first instance it was decided by the Lord Ordinary in favour of the Corporation. On an appeal the Court of Session with one dissentient decided against the Corporation. The case was therefore brought to the House of Lords, when the majority decided in favour of the Corporation. The one dissentient was Lord HERSCHELL, of whose ability as a lawyer there is no question. The result is exactly what we anticipated several months ago. In a mineralogical sense, and, we might say, in a microscopical, clay could sometimes be considered a mineral; but in the sense in which the word is used in Courts it could not have that acceptance.

CONFERENCES on copyright are not exhilarating to anybody but the speakers. There is, however, a chance that the one which opens next month may, through the influences of the surroundings, have less of the qualities which are supposed to be inherent in anything relating to the Dismal Science. A Congress in the Senlis Gallery of the Doges' Palace of Venice should certainly show some signs of grandeur in order to be worthy of the place. On Saturday, September 15, the inauguration of the Copyright Conference will take place. Then there will be a discussion upon the new copyright proposals of America, which are another example of the ease with which this country can be hoodwinked in its foreign relations. It will then be considered whether any improvements can be made in the foolish recommendations of the Convention of Berne.

The relations between authors and publishers will be discussed, and a model form of contract will be exhibited. The success of the Congress will be celebrated in a characteristic way with the aid of fireworks. It is worth remarking that the French artists will not allow themselves to be befooled by conferences of fussy men who are seeking after notoriety. They have lately held a meeting at which it was declared that their interests were more menaced than ever by the Americans. So much plain speaking is not to be expected in England, where there is unbounded faith in congresses and conventions.

M. BAUDOUIN, whose decorative frieze for one of the schools of Paris, and paintings in the theatre of Rouen, have been reproduced in *The Architect*, is again successful in the competition for the decoration of the Mairie of Arcueil-Cachan. His design was well deserving of acceptance from the poetic spirit which was manifested in it. Of all the pupils of M. PUVIS DE CHAVANNES, not one has been more successful than M. BAUDOUIN. But he is no copyist, for his style is distinct from his master's in everything except in a recognition of the relation between poetry and painting. It is a pity there is no French LESSING to write a discourse upon the paintings of the master and pupil. The second prize was awarded to M. BRAMTOT, and the third to M. VIMONT. Examples of the paintings of both have been illustrated in *The Architect*.

Now that the Post Office Department of France has at last taken possession of the building which for years could not be used owing to the difficulty of finding suitable lifts, a question arises about the disposition of the part of the site of the Tuileries containing the wooden sheds which served for the temporary chief post-office for Paris. It will not do to have the sheds exhibited to the visitors who are to appear next year. Some officials desire to convert the site into a garden, but others have a grander scheme, and want to have the entire site of the Tuileries used for a colossal memorial of the Revolutions. It was intended to apply for a grant to enable the place to be transformed, but the Chambers did not wait to discuss the subject. One thing is certain, that some improvement, although it may be only temporary, must be effected before next year.

OPERATIONS have begun this week for carrying out the improvement designed by a private benefactor, as we lately noted, on the waste ground on the western side of the Law Courts, and the ground has been invaded by workmen with an imposing array of wheelbarrows. The work is expected to be completed in about five or six weeks' time. Unfortunately the winter will by that time be getting near, so much of the enjoyment of the place as an ornamental garden and open-air lounge must be postponed for another year.

THE fate of relics in Scotland is not always happy. Persons, it seems, are willing to possess them if possession does not necessitate pulling out the purse. A week or two ago there was found in the foundation of an old house a fragment of a sculptured stone that in days gone by had formed part of an altar tomb in Arbroath Abbey. An inscription on an effigy is rare, but there was lettering on the collar of the torso, and this has been deciphered by Dr. JOSEPH ANDERSON, of the Edinburgh Museum of Antiquities, as forming the words, "HIC JACET ALES . . . GARDI"—part of the inscription being obliterated. The date of the stone is put down as about the end of the fifteenth or beginning of the sixteenth century, and several names of ALEXANDER GARDYNE appear in the Abbey chartulary about that period, pointing probably to the identity of the tomb. The stone, however, disappeared on Saturday from the yard of the builder of the new Inverbrothock Church. As it weighed about three hundredweight, it must be imagined that only the most enthusiastic devotee of archæology could have been inspired to annex it. At Dalmeir, it is stated, a workman some twenty years ago found a Roman monumental stone with well-preserved inscription, but as no one was found to contribute a shilling to the man for his time, an American secured it for Chicago.



## THE FADING OF WATER-COLOURS.

WHEN it was announced by Sir J. C. ROBINSON that the water-colours in the South Kensington Galleries were gradually fading, no visitor was prepared to say that anything was ever done to resist the transformation. One might go through the galleries of the Museum all the year round without meeting with an officer who seemed to watch the effects of sunlight or gaslight upon the drawings. At the National Gallery a visitor may always expect to be disturbed while he is gazing on a picture. Sir F. W. BURTON apparently is always thinking of his treasures, and rushes in with a magnifying glass from time to time in order to ascertain whether the change of a cloud may not produce an effect upon a particular picture. If his scrutiny is satisfactory he goes away smiling. But at South Kensington there is no longer any resemblance of the old enthusiasm. It is now to all appearance conducted on the principle adopted in the ordinary Government office, which is to avoid trouble at all cost. If a visitor has need of information, he will do well to consult the constables rather than the permanent officials.

With all their knowledge of the contents of the museum, it was not to be expected that the policemen could discern any changes which time, gas, or electricity could produce in the water-colour drawings, and of course the public knew enough about the value of the official statements. There was so little confidence in the administration, that the mere assertion by one expert of a deterioration in the drawings was followed by the appointment of a Special Commission.

The first report which has appeared is from the scientific advisers, and, like most documents of the kind, it is of a roundabout character, and facts which are universally known are announced as if they were discoveries. When it is found that the reporters are puzzled at the beginning as to why a pigment is coloured, or, in other words, why a pigment is a pigment, a reader will be apt to throw the report aside. But that sort of speculation must be taken as part of the scientific procedure in an inquiry, as in the ancient systems of conducting war there are no short cuts. We must make allowance for the preliminary posturing, or take no notice of it, and draw what is practicable from the researches.

It may be said that the conclusions of the experts show that the fading of water-colours is an extremely slow process unless under special conditions. It would take a century at South Kensington to produce any marked alteration in water-colour drawings, supposing they were subjected for that time to sunlight, and they must be exposed for thousands of years to artificial light to produce a similar effect. The latter statement will be a surprise to many, and, for our part, we believe injury to the paper of the drawings would be accomplished in a lesser time. But the experiments by Dr. RUSSELL and Captain ABNEY will be sufficient to allay a panic among collectors, although there may be some misgiving about assuming that the condition of thousands of years hence can be inferred from the effect produced by light on a series of washes by a practised hand on WHATMAN'S drawing-paper. We may conclude that no fear of a diminution of value will keep people from buying water-colour drawings. The estimates of the time allowed for the permanency of water-colours may be over-liberal, but, with all deductions, enough remains to give security to buyers. We may therefore conclude that the patronage of a form of painting which may be said to be English will remain as before or become more general.

It is plain, however, that colours do not fade in an equal degree, and after a number of years a scheme of colour on a drawing may be changed. But it is not impossible that cases may arise when the change will be advantageous. The experiments, also, will appear to be unfavourable to the system of using opaque and transparent colours together. Twelve mineral colours were found to withstand the action of light, and it is easy to imagine the difference which would be presented by a drawing in which they were used along with transparent colours which are more amenable to light. Another result is that Chinese white not only diminishes the permanency of any colour with which it may be combined, but it ceases to be white and therefore changes the other colour. Prussian blue, crimson

lake and Chinese white become a bright pink instead of a bluish purple. These circumstances were observed before, but the report will give them scientific precision.

But the number of colours which may be considered as permanent is remarkable. Out of thirty-nine colours in open tubes which were exposed to the atmosphere, twelve were not affected and two in a slight degree. When the same colours were exposed in dry air twenty-two were unaffected. In a moist atmosphere the number fell to ten, but in an atmosphere of moist hydrogen gas the number again rose to twenty-two, and when the trial was made in vacuo there was hardly any change. It is even laid down as a rule that all pigments are permanent when exposed to light in vacuo.

It must be remembered that the conditions under which the experiments were made did not entirely correspond with water-colour painting. If every artist could lay on his washes once and for ever like the practised hand employed by the Commission, the results would be conclusive. But water-colour drawings are not always produced in that way, and what is needed are experiments with works of another kind which are more than "a series of washes." It would appear from some of the experiments that most danger arises from combinations of colours which are mixed by the artist himself. In one experiment, all the combinations of which Prussian blue was an element were transformed. But it cannot be expected that prepared colours will ever be produced to suit all circumstances. The artist must always be to some extent his own colour-mixer.

But the inquiry will not be complete if it is restricted to an analysis of colours. It would be well to inquire whether drawing-papers exercise no influence. Considering how varied are the sources from whence materials for paper are derived, is it not unreasonable to suppose that the paper is always innocuous, and is without effect on the pigments which are applied? Another subject might be whether the combination of colours by different makers will produce a result the same as that when the cakes or tubes of the same maker are used. There are colour makers who are supposed to be most successful with certain colours; one, for instance, always produces excellent crimson lake and Prussian blue, but it is not impossible that they would not ally themselves in a friendly way with the products of a rival maker.

There are many other points which will suggest themselves to the artists on the Commission as requiring investigation. Nowadays commissions are not restricted by rigid conditions, and although the primary purpose of the inquiry was whether the water-colours in the South Kensington Museum had become less valuable, it is easy to give a wider interpretation to the words of the direction by which the investigation was initiated.

The report is an additional testimony to the value of the electric light as a means of illumination in galleries. It was found that with colours most easily acted on, and when placed under conditions most favourable for fading, no change took place in the majority of colours and mixtures. This conclusion cannot fail to be used by the advocates for the opening of the National Gallery at night. For it will be said that oil-colours must excel water-colours in permanence, and when the danger of fading with the latter is infinitesimal, with oils it need not be taken into account. But a special inquiry will have to be made on the subject, and it would be best to allow the trustees of the National Gallery to select the chemists and members of the Commission.

The report does not give any suggestion which may be utilised by architects when designing galleries or rooms which are to hold pictures. The nearest approach to one is in the part which says that the presence of moisture and oxygen are in most cases essential for a change to be effected even in the vegetable colours, and the exclusion of moisture and of oxygen, especially oxygen in an active condition, would give a much longer life to the vegetable colours than they enjoy when freely exposed to the atmosphere of a room. It is not difficult to operate on the moisture, but with free oxygen it is otherwise, and it is to be hoped that more will be said on the subject in future reports. In an inquiry of the kind, it might be supposed that questions of lighting and heating would arise, and, therefore, the presence of an architect on the



Commission would be an advantage. Architects are not in favour at South Kensington, and they were ignored in forming it.

### NATIONAL GALLERY, DUBLIN.

SOME of the recent purchases for this gallery have now been hung. First there is a full length portrait of John Fitzgibbon, first Earl of Clare, the Lord Chancellor of Ireland of the time of the Union. This fine picture, which was recently purchased from the Fitzgibbon family, at their seat, Mount Shannon, in the county of Limerick, was at the sale erroneously attributed to Sir Joshua Reynolds, but is no doubt in reality the work of Hugh Hamilton, who was at the time it was painted in the full enjoyment of his reputation as the chief portrait painter in Dublin. He is represented standing in full Chancellor's robes, holding the official purse in his right hand, and appears to be speaking somewhat energetically about a paper on the table beside him, to which he points. For an historical collection of this kind the picture is an acquisition of importance, the subject being a prominent figure in Irish history, and the portrait having the qualities of thorough authenticity and artistic excellence, the latter also exemplifying the native talent of the time.

Next there is a portrait by Sir Joshua Reynolds of Richard Burke, the only son of the Right Hon. Edmund Burke, whose premature death at the age of thirty-six brought his father's career to an end, and broke his heart. The picture represents a young man of almost effeminate beauty. As a painting it may be said somewhat to lack finish, and probably was commenced and put aside to make way for the one now in the possession of Earl Spencer, and from which an engraving was made for Burke by James Ward, which so satisfied him that after receiving a few impressions of it for his own use he returned the plate to the engraver as a gift. A good impression of it from the Chaloner-Smith collection is here placed near the picture for comparison. Until it appeared at Christie's its existence was unknown, and it is likely to be the only portrait of young Burke except the one above mentioned, and a replica of it in the possession of Lord Fitzwilliam.

A portrait represents King William III. as a boy of about eight or nine years of age. It has always been attributed to Cornelius Janssen, but is more likely an old copy of the original, which is known from a contemporary engraving. It comes from the Hardwicke collection, and was probably brought to England by one of the family who was sent as ambassador extraordinary to the Hague early in the last century. Near it is a quaint contemporary portrait of Robert Dudley, Queen Elizabeth's Earl of Leicester, appointed Lord Deputy of Ireland the year of his death. In another part of the room is a pastel drawing of Philip Earl of Chesterfield, of the "Letters," Lord-Lieutenant from January 1745 to October 1746. It is the work of William Hoare, commonly called Hoare of Bath, where he flourished in the days of its glory, and was famous for his coloured crayon or pastel portraits, of which this is a first-rate specimen.

Oil portraits of Lord Carteret and of the Marquis Camden have also been added to the list of Viceroy's represented in the collection. The former is by Hudson, the master of Reynolds, and comes from the Hanbury-Williams family. The latter is by Sir Thomas Lawrence, as well as a portrait of the Right Hon. John Wilson Croker, which is looked upon as one of the painter's masterpieces. The picture came from Lord Lonsdale's collection, and has been engraved in mezzotint by Samuel Cousins. Illustrating another phase of Irish genius will be found the portrait of Quin, the Irish actor, in his part of Falstaff, in a group from a scene from the play of "King Henry IV." It is painted by Francis Hayman, R.A., a contemporary of Hogarth. In the same category is the little head of Macklin in the part of Shylock, by Zoffany.

### ARCHITECTS' DRAWINGS AT EXHIBITIONS.

AN article on the "General Indifference to Modern Architecture," from the pen of Mr. G. Washington Browne, of Edinburgh, appears in the current number of the *Scottish Art Review* :—

Mr. Honeyman, in his able article on "The Exhibiting of Architectural Drawings," has, Mr. Washington Browne says, struck deep at the root of the lack of interest in such exhibitions. If this lack of interest were confined to architectural drawings it would be a matter of comparatively little regret, as an architect would no more desire to have a final judgment passed upon his artwork from a conventional drawing representing his building from one fixed point of sight, than he would desire to have his deportment judged by a *carte de visite* representing his person in one single aspect. He could equally well afford to dispense with both representations, or, if you

prefer it, *mis*-representations. The indifference of true lovers of art to architectural drawings is an unpleasant fact that architects must admit, with more or less reluctance, according as they feel it touches their art; but they might endure this neglect with calmness did it measure the full extent of the indifference. I fear, however, the evil is a deeper and more serious one—that it is not limited to architectural drawings, but extends to architecture itself.

Before we can accept the theory that the deserted condition of the architectural gallery is to be wholly accounted for by the absence of the buildings themselves, we must be persuaded that, were it possible to have them present, they would be studied by all true lovers of art with an interest and an affectionate regard equal to that bestowed upon the paintings in the adjoining galleries; or that, in the places where they stand they are so studied and lingered over. I am not sanguine enough to believe that they are so. Do the various buildings that are within the grounds exercise this attractive influence? And I seek to apply the question to two buildings only, which are most favourable to that view of the question. Is the Bishop's Castle regarded with that loving interest that a local building called back into life from the grave of past centuries might be expected to excite, were we to accept Mr. Honeyman's theory? Is the clever reproduction of a Dutch House, in which Van Houten's cocoa is dispensed, studied or lingered over with one tithe of the affectionate regard bestowed on a single picture of Maris or Israels? And yet these have much in them to attract the curious—a more numerous multitude than true lovers of art. But it may be urged that these are not real, that they are but representations, neither cleverer nor better than many of the architectural drawings, and equally false as far as true art is concerned. Then surely the University Buildings on Gilmorehill are sufficiently real; and how many of the refined and cultured men who enter its gates daily study or think of it as a work of art, though seeing it just where it stands? The Royal Exchange is sufficiently real; and how many of the wealthy merchants who pass under its noble portico regard it, or think of it, as a work of art? Yet many of these men are art patrons, with worthy sculptures in their halls and exquisite paintings in their rooms, and who shall say they are not, many of them, true lovers of art? And what shall we say of gifted and successful painters who are content to live in houses innocent of architectural art? or of Royal Academicians voting for the election of Architect Associates on hearsay, without a knowledge of or opinion concerning their artwork? Surely this, that even true lovers of art do not love all the arts equally; and there are many reasons, technical and other, why architecture must always have fewer admirers than the sister arts of painting and sculpture. Architecture is their elder brother, more practical and hard-headed than they, and less lovable than the softer, fairer sisters.

There seems, then, to be a weightier problem requiring solution than that Mr. Honeyman has dealt with, and which bears much the same relation to his that the substance does to the shadow. Will modern architecture bear the test of attractiveness which Mr. Honeyman applies to the exhibition of architectural drawings? And if it will not, is the inference inevitable, "it is falsehood that intervenes"? If the test and inference are true as applied to architectural drawings, can we escape them when applied to architecture? Or is the test unfair and the inference untrue in one or both cases?

It appears to me that the lack of interest taken in architecture outside the profession, whether it be in conventional drawings or in the buildings themselves, is due in large measure to the absence of any personal identity of the architect with the artwork he produces. The personal identity of the artist with his work, of the producer with the thing produced, is a special characteristic of modern life and thought. The value attached to a picture attributed to a great master is determined rather by the presence or absence of an authentic signature than by the intrinsic merit of the picture itself. The personality of the architect is seldom thus identified with his buildings, and this has much to do with the lack of interest taken in them by lovers of art as well as by the general public. Add to this that a building is not the work of the architect's own hands in the immediate and direct sense that a picture or a statue is the handiwork of his brother artists of the brush and chisel, and his personality becomes more obscure, and the interest in his work diminishes proportionately. Why should not the architect inscribe his name on his building as the painter does on his canvas, or the sculptor on his marble and bronze? It is done in France, and the French take a deeper and more real interest in architecture than we do. How many of those merchants or students we spoke of know the name of the architect of the building they frequent, or would be interested in remembering it, though they heard it? Yet one never looks at a painting or a statue without asking, "Who is it by?" Erase the names from the canvases in the picture galleries, and how much of the interest vanishes with them?

Let me not be understood to say that by inscribing the architect's name upon the corner of our buildings, general



interest would at once be excited in architecture. The interest would not be immediate, and I have already indicated my belief that interest in architecture will never be so general nor so deep as in painting and sculpture. But I submit that the absence of a personal identity of the architect with his work has much to do with the lack of interest in this important department of art.

### MASONS' MARKS.\*

THE substance of this paper was prepared many years ago at a time when I found myself interested in the subject whilst engaged in work on a building in the North of England, where upwards of 1,000 masons were employed, and each man working in the sheds had a separate and distinct mark, a register being kept by the chief foreman wherein every man's name and mark were entered side by side.

The system in use at the present day amongst masons is that each man, as he finishes his work at the banker, places his mark upon the stone before it leaves the shed. The banker is the stone bed or bench upon which a mason works when squaring the rude material and forming the finished article. In the Coventry Guild accounts of 1461 the benches in St. Mary's Hall are called bankers. These marks have hence been called banker marks, and perhaps the name is more appropriate than that of masons' marks, as the setters, who are usually selected from amongst the best workmen, make no marks upon the stone. The object of the register of marks, and the necessity of the marks being placed upon the various stones, is that the setter whilst erecting the walls is able to distinguish the work of individual masons, and if he finds anything wrong with the stonework can complain to the foreman, who will ascertain to whose account the error is chargeable. Masons' marks are now placed upon the top bed of the stone, and hence do not appear upon the face of our new buildings, but in times past, when Gothic architecture flourished in England, from later Norman, Perpendicular, and even to Tudor periods, the marks were for the most part placed upon the face of the stone, to be seen and inspected; but with the decline of Gothic architecture they appear to have disappeared from the face of buildings.

On leaving Manchester, in 1872, I found leisure to look up the subject in this locality, and the eleven sheets of marks before you represent, for the most part, those upon certain Warwickshire buildings within a few miles of Coventry collected at that time. There appear several kinds of marks in this district; first, a mere rude scratch of from 4 to 6 inches in length, and from 3 to 5 inches in breadth, made of various easy shapes, and formed by sharply drawing the edge of the chisel upon the stone. These are found upon the buildings to the west of Caesar's Tower, on Gaunt's Perpendicular work, and the so-called "Saintlow Tower" at Kenilworth Castle, and at Bubenhall Church. They are probably the work of restorers, and not of the original masons who first erected the buildings. Secondly, there are the more finished marks, smaller in size, of from 1 to 3 inches by half an inch to 2 inches, assuming correct forms and lines shaped into letters, numerals, squares, crosses, arrows, and various other characters. At Kenilworth they appear upon Leicester's Gatehouse and Leicester's Buildings (1570 to 1575) in considerable numbers, and also upon various parts of the castle restored by the Earl of Leicester in those years. They are found upon Berkswell and Foleshill Churches, and of a slightly larger size upon the walls of the crypt under the banquetting-hall (1392) at Kenilworth Castle, and exceedingly small upon the inner walls of the tower of St. Michael's Church at Coventry (1373 to 1395). These marks are, for the most part, worked in the centre of the face of the stone, unless the stone has been cut to make it fit in the course. They appear both under and above the plinth, and from the base to the top of the buildings. A third kind of mark is upon the Coventry town walls (1355 to 1415), and consists of marks in the shape of crosses and arrows, of sizes of 6 inches by 3 inches, cut deeply in the stone. A fourth kind is the hanger or line mark, peculiar for its length of line, which has a figure or character at one end, whilst the other end is generally turned up or down. These kind of marks are found on Berkswell Church, and at Kenilworth Castle upon the White Hall (1392), and the base of the staircase projection at the angle of Leicester's Buildings, which was probably the original Saintlow Tower built about 1390, and formed part of an older erection than Leicester's Buildings. Fifthly, there are also circle marks of from 5 to 16 inches in diameter, some plain and some with rays radiating from a central point. Circles with segments of circles and other circular form marks appear. These large marks greatly disfigure the stone upon which they are drawn; but smaller examples occur at St. Mary's Hall, Coventry (1394 to 1414), upon Hawkesworth's Porch to Leicester's Gatehouse,

Kenilworth, and upon Astley Church font. The sixth kind are double-pointed marks, generally in letters, as at the buildings west of Caesar's Tower, Kenilworth, and Berkswell Church and in monogram marks upon Foleshill Old Church.

Having thus briefly gone through the principal kind of marks found in the district, it may be as well to particularise the various characters met with, and then say something about masons' marks in general. Plain cross marks of two strokes only are common and occur at Kenilworth Castle, on Leicester's Buildings, circular staircase to ante-room, Leicester's Lobby and Gatehouse, and upon the Water Tower; also upon the Kenilworth Priory barn at Temple Balsall, Berkswell, Exhall, Corley, Astley, Baginton, and Sowe Churches. Two of these occur on one stone at Leicester's Buildings, which is unusual. A cross of three strokes occurs on Leicester's Gatehouse, and upon the circular staircase to ante-room. A cross-mark of four strokes occurs at Offchurch Church, whilst a similar one at Lichfield Cathedral has one of its ends terminating in a crook. There is a cross of two strokes more deeply cut on the buildings west of Caesar's Tower, and upon the projection to Leicester's Buildings, at Kenilworth, whilst there is a cross fitted, with the thin points meeting at centre, upon the buttress of corridor leading to the crypt under the banquetting-hall at Kenilworth. On the Coventry walls is a plain deeply-cut cross-mark with equal members; the same appears with the leg extended, and the same mark with legs in the shape of an inverted V occurs, and also one having two strokes on the left side. A regular formed cross-mark, with legs, occurs at Kenilworth, in the crypt under the Great Hall in Leicester's Gatehouse, and in the base of the staircase projection to Leicester's Buildings. Deeply cut cross-marks, with the points terminating in dots of various forms, occur upon the Perpendicular work of the banquetting-hall and recess adjoining at Kenilworth Castle, St. Mary's Hall, Coventry, and Exhall Church (near Coventry). At the latter place are several interesting specimens close together, upon the west side of the tower, the lower parts of which are enclosed within a circle. There is an interesting panelled stone with a masons' mark at Exhall, a sketch of which is shown on sheet No. 9 of drawings. On the walls of the Presence Chamber, Kenilworth, is a cross with an angle under it, similar to those at Chester Cathedral. The square cross form with ends turned up towards the left occurs at the Priory Gateway, Kenilworth, whilst at Temple Balsall and Stoneleigh Church the ends of the cross are stopped or barred in some or all of its members.

Masons' marks are represented hereabouts by sixteen letters of the alphabet; some letters are rarely used, whilst others, as N, R, and Z, are often repeated; but alphabet marks are not found to be largely used on most buildings. Sometimes a double W occurs, as at Kenilworth Old Church; at Wyken and Sowe Churches a W has dotted ends; at other places the ends are barred; on the buildings west of Caesar's Tower, Kenilworth, an R has double points. Numerals are not often represented; there is a small figure 1 at St. Mary's Hall, Coventry, and the figure 4 occurs on the buildings to the west of Caesar's Tower, and on Lunn's Tower, Kenilworth; a 1, Ryton Church, and on St. Mary's Hall, Coventry, doorway to crypt. There is a figure 8 in Dudley's Lobby, Kenilworth. The hour-glass mark occurs at Berkswell Church, Leicester's Buildings, and Dudley's Lobby, Kenilworth. The pentacle or five-pointed figure exists in numbers upon the north end of the stables at Kenilworth Castle, sometimes with plain points, at others dotted at the terminations. The hanger or line marks are peculiar, and the terminations at the end are strange, as will be seen in the drawings. Arrow marks appear upon St. Mary's Hall, St. Michael's Church tower, and the city walls at Coventry; upon Foleshill Old Church, the oriel window of the banquetting-hall at Kenilworth Castle, and at Temple Balsall Church. There are many other figures representing squares, angles, and various geometrical figures, as the drawings will show.

We have thus run through the chief kinds of masons' marks found upon the buildings in the Coventry and Kenilworth districts, and now proceed to offer some remarks upon the marks in general, first premising that masons' marks are found in all civilised countries—on the Pyramids of Egypt, the Anglo-Roman work of Hadrian's Wall (second century, England), the temples of India, and the walls of Allahabad, walls in Syria, the church of St. John at Jerusalem, on Greek and Roman temples, and the wall of Carthage. The explorer has even found them upon the squared stones left and not used at the quarries by King Solomon, and in a tumulus in the island of Zetland, in Mexico, Persia, Lycia, Mesopotamia, and Asia Minor. Most of the great ruins, castles, manor-houses, cathedrals, and churches of England, Ireland, Scotland, France, Germany, Switzerland, Austria, Spain, Portugal, the Tyrol, and Italy, show these marks upon their walls. They occur upon the finished stones only, generally upon the outer walls, from base to battlement. Through the world many of them agree in character, many of the same figures being universally produced. We may well be at a loss to comprehend why these

\* A paper read by Mr. T. W. Whitley, of Coventry, on Wednesday evening, the 8th inst., at the meeting of the Royal Archaeological Institute, Leamington.



precisely similar marks should have been adopted in different countries, unless we attribute them to some widespread organisation, some system adopted by and coming from a central source or authority. In England few if any marks appear on very early Norman work, and I may hazard an opinion that their origin, in a great measure, was fostered, if not attributable, to the guilds of masons, whose members used them.

Now, with reference to these guilds and their foundation, the Pope issued a bull shortly before the year 1200, granting powers to bishops and others to build churches, and to attach to them a certain number of "liberi muratores," or "free-masons," which had great effect upon church buildings at the time. The purpose of these workmen was to direct and execute the more ornamental parts of buildings, and Bishop Lucy, building his cathedral at Winchester in 1202, instituted a confraternity to last five years, and almost simultaneously masons were at work upon Wells (1213), Salisbury (1220), Worcester (1218-30), Peterborough (1233-46), Lichfield (1235), Durham (1230), Ely (1235), Lincoln (1240), York (1227), and many other places in England, encouraged by the clergy to band together. The greater lords and gentry soon obtained the services of these early guild masons to build their castles and manor-houses. The guild masons spread far and wide, becoming travelling masons, amongst whom were many foreign workmen, coming and going from place to place, where they had lodges or guilds, sometimes settling permanently, where sufficient work could be obtained, each mason in the guild having his mark. It is not known in what year the masons first obtained a guild in London, but the Masons' Company, springing from the guild, had its existence in the time of Edward III. At Coventry there was a Masons' Company at an early date, but it never was large in numbers. In 1448, out of a total of 603 armed men supplied by the twenty-three City companies, in a call during the wars of York and Lancaster, the masons only supplied seven men, the average being twenty-six for each company. In the play acted before Queen Elizabeth, at Kenilworth, in 1575, valiant Captain Cox, a mason of Coventry, appeared, and was probably engaged in the Earl of Leicester's extensive additions at that time just completed. It does not seem, as has been thought by some, that there was a system of symbolism in these masons' marks, and that each character had an hidden meaning. In this country the stones were picked at random by the setter, and worked indiscriminately into the walling, and thus sometimes the mark is upside down and sometimes on its side, as the setter's will or the necessity of the case required. If they had been symbolical, greater care and regularity would have been used in their arrangement in building the walls.

The marks have nothing whatever to do with the Freemasonry of to-day, and there is little to be solved about them. Kings, lords, and gentry had their arms and badges to distinguish themselves and their families, the merchant had his mark, by which in later times his goods were known, the porcelain manufacturer placed a mark upon his manufactures, and we have shown the purpose for which these marks are now used on large works. They were the forerunners of trade-marks, and diffused by travelling masons. We know that even beggars and tramps in our day have marks which they leave in different ways, to distinguish good, bad, and indifferent places for their companions to call at, whilst the Bedouin Arabs have marks which they place on tent or wall, by which their tribes are known and distinguished the one from the other. Upon examination of the stonework of the Norman Keep of Kenilworth (circa 1130), no masons' marks are found, but the late Mr. Godwin (who was the first to direct attention to the existence of these marks) alludes to one representing a letter W, but this was probably upon the restored parts of the buildings to the west thereof. I have, however, found marks upon late Norman work at St. John's, Chester, Offchurch Church, Beaudesert Church, and Berkswell Church, but they may be upon restored parts. These marks, as has been said, I venture to suggest as more or less attributable to the members of the masons' guilds or companies. Every man, after serving his apprenticeship and becoming free of his guild, had a mark allotted him, and the mark when placed upon the stone not only served the place of individual recognition, but was sometimes for the purpose of payment when piecework was done. Their occurrence is evidence of a great building society having been diffused through the country, which had a common object and purpose. Where large quantities of the same mark are found, as the N at St. Michael's Tower, Coventry, or the R and X at Leicester's Buildings, it seems probable that all the stones thus marked were not the work of one workman alone, but of several working in common in the sheds, and the figure was adopted for the payment of taskwork. It is likely that most of these stones were worked and marked at the quarry, and brought to the building for use as required. It is rarely that two marks occur on any one stone. In that case, probably, two men worked upon it, for some reason. Instances occur at Beaudesert Church and at Kenilworth. Where a large body of

men were employed on a building, it was often to their benefit to prepare the stones by piecework, Gothic stonework being of small, and of an innumerable quantity of stones, with considerable work thereon. To enable the builder to give payment to the numbers employed in an easy way, without error (for we cannot suppose that in the early days, when few masons could write, that a very elaborate system of book-keeping existed), the time being calculated by the day, and not by the hour as now, as the men finished the stones they placed their mark upon them to show the work done, and were paid accordingly. The marks, too, were a kind of rude heraldry, the secret shop marks of the trade, by which not only was one mason known to the others, but the marks were in some cases handed down from father to son, and by these marks the members of the family, or shopmates working together, could, in some cases, be distinguished by various additions being added to the chief or foreman's mark. The marks upon the Coventry city walls appear to illustrate this. Taking the foreman's mark as a cross of equal members, another person has a similar cross with a longer leg added, another with legs slanting right and left, added to the foreman's mark, another with two slanting strokes thereto, and another with the two slanting strokes without the first or foreman's mark appears.

Masons not only used their marks upon the stones they worked, but placed them upon the various instruments of their trade, for in an excavation at Newminster Abbey, near Morpeth, in 1878, a hone or sharpening stone was found, upon which was a masons' mark. In many instances, by careful attention, the approximate number of masons engaged upon a building may be found by counting the number of marks thereon. There are no less than thirty-six distinct marks upon Leicester's Gate House, Kenilworth, which are mostly repeated upon Leicester's Buildings, and discernible upon other parts of the Castle, which the Earl of Leicester enlarged in 1570, at the great cost in those days of 60,000*l.* to render the place suitable for the reception and residence of Queen Elizabeth; but upon these buildings we find many stones unmarked, side by side with those having marks thereon. Were these left so by accident? It would be necessary to engage non-guild or non-company masons and local masons to hasten on the work, and thus the existence of non-marked stones may to some extent be explained. The stones of some buildings have no marks shown whatever. Were all the worked stones left without the marks the work of non-society men? Then some were the work of apprentices, who would have no mark. The number of apprentices that a master mason could have was regulated by constitutions. The stonemasons of Strasburg in 1459 were to have but three each, and we find that "he may set to work fellows of the same lodge—that is, if the Lord so permit"; but we are told that if "he have more buildings than one, then shall he have no more than two apprentices on one building, so that he shall not have more than five apprentices upon all his buildings." In one of the earliest English documents where the word "Freemason" occurs, viz. in the building contract of 1435, where William Horwood, "master mason," contracts with Richard Duke of York, "to neyther sett mor or fewer Freemasons, rough setters, no boys thereon, but such as shall be ordeigned" (that is, non-members of the Company), from which it appears that "unordeigned" masons were sometimes set on at the work, the "rough setters" being local men and "stone wall or hedge builders," and the "boys" apprentices. Some local instances there are where old stones, having no mark on the face, have been found to have one upon the upper bed similar to the work in our time. We find that as some buildings advance in height the marks become fewer in number as the building progresses, whilst there are many marks in the lower courses and few in the top. But this is not always the case, and St. Michael's steeple contains marks from the ground to the top of the tower. The thirteen modern marks shown on drawing No. 7, which were placed by the masons working this year at St. Michael's Church restoration upon the top stone of the spire, fixed on August 1 last, may be of interest. A knowledge of these marks is useful to the archaeologist. For instance, on careful examination we find that the marks upon Leicester's Buildings, Kenilworth, and the projection or angle buttress adjoining thereto, are of quite different kinds, and this leading to re-examination of the buildings we find the projection is part of an older tower; again, the old stabling at Kenilworth Castle has been much disturbed, and the existence of marks on the northern end point out the unaltered part of the wall there. They may also help to fix the date of the erection of buildings in some cases. Perhaps I have devoted more time to this subject than it deserves, but, at all events, I hope to have shown that the subject is of interest. It is possible that if the various marks in the Midlands were collected together, with the known dates of the various buildings they are upon added, a more definite conclusion could be come to as to the object, use, and meaning of these characters, and it would throw considerable light upon the working of the builders to whom we owe the ancient and historic buildings of our native land.



## ART TRAINING FOR JEWELLERS.

THE arrangements between the Birmingham Jewellers and Silversmiths' Association and the committee of the Municipal School of Art, for the opening of art classes for students between the ages of twelve and twenty have been completed. The following scheme has been accepted as an experiment for two years:—(1) A special room to be set apart for the Jewellers' Association class, in the Board Schools, Ellen Street, Birmingham, the students to be taught by a separate master or masters, on definite lines, preparatory to the study and practice of artistic design, suited to the trades in which the students are engaged. (2) Every student to be entered by and through the Jewellers' Association, and to have the option of attending the classes five nights per week during the autumn and winter terms, but to undertake to attend at least three nights per week as a condition of being allowed to study. (3) The education of the Association students to be free, except so far as the cost of drawing materials, which they will themselves provide. To secure this the committee propose that the Association shall subscribe one-half the cost of the education of the students, the employer in each case providing the remaining half. The School of Art committee have met this case by placing the entire fee at 3s. the autumn, and 2s. 6d. the winter term for each Association student. These fees must be paid in advance. The plan is to commence in September, on condition that forty students are prepared to take advantage of it. The committee hope that a great impetus will thus be given to the character and position of the trade in its artistic developments, as well as a new interest awakened in their occupations on the part of jewellers themselves.

## THE LATE MR. JOHN M'LEOD.

THE death of Mr. John M'Leod, of Hope Street, Glasgow, at the age of fifty years, took place last week at his residence, Overcliffe, Dumbarton. Mr. M'Leod, who was a native of Dumbarton, and son of Mr. William M'Leod, joiner, saw miller, and timber merchant, The Saw Mills, Dumbarton, started business as an architect many years ago, and his career has on the whole been successful. His professional attainments were of a high order, and his services were therefore constantly in demand. He has designed many public buildings in Glasgow, including the Christian Institute. In Dumbarton he acted as the burgh architect, and designed many public buildings, chiefly in the way of schools and churches. His latest effort in the latter direction was the West Bridgend U.P. Church, a structure characteristic of his work for his professional skill and ability. Knoxland School in Dumbarton is also one of his buildings. Deceased was of a modest, unassuming disposition, greatly respected by all who shared his friendship. For some time past he has been in rather indifferent health, but the end came somewhat suddenly, having been seized with a very violent illness, which baffled all medical skill. Mr. M'Leod received his professional training from Mr. Spence, of Glasgow, after which he went to London, where he was engaged under Mr. G. E. Street.

## TESSERÆ.

## French and English Windows.

SIR G. G. SCOTT.

THE Romanesque windows were simply openings with round heads, the jambs and arches being either perfectly plain, moulded, with or without enrichment, or the jambs shafted. These windows were most usually isolated, but were here and there grouped into couplets, triplets, &c., or made to form portions of continuous arcading. In the early days of the Transition the windows remained unaltered, otherwise than as to the general refinement of their details. Later on the arches were made pointed, and their proportions somewhat elongated; and even in the fully developed Early Pointed style—properly so called—the window differs little in principle from that of the Romanesque period, though in fact it assumes a widely different form, through its carrying towards their ultimate results of the principles of grouping began during the previous styles, and those of refinement and elongation incidental to the Transition. It is in carrying out these principles to a still greater extent that the Early Pointed of England differs from that of France. It is really the same style, and no important feature can be pointed out in the one country which is not to be found in the other; but just as the Germans, by dwelling longer on the Romanesque style, rendered it more refined and perfect than elsewhere, the English, by the continued retention of the unmullioned window, systematised its use in a manner not equalled in other countries. I see no difference of principle in the fenestration of the Early French and the Early English Pointed styles; in both the principle was the

decoration and combination of single lights. Nor do I see that in England this was done in a manner essentially differing in any respect from what was common in France. The great difference was the far greater width of the French openings, which often rendered their windows inelegant in proportion, while it offered a noble field for stained glass. The characteristic of the English windows, on the other hand, was narrow and tall proportions, and a greater amount of enrichment of the jambs and arches, though none of these are by any means constant features. Sometimes we find in English work lightness carried to a vicious extreme, as in the beautiful but frail eastern transept at Worcester; though in the majority of instances it retains a masculine firmness and solidity, as in the east end of Whitby.

## Etymology of "Fret."

S. BEAZLEY.

When I mentioned the triangular *frette* of the Saxons, I had not met with the following etymology of the word, and the probable origin of the ornament, in Turner's "History of the Anglo-Saxons," which, as it is pleasant to derive all our decorations from objects in nature, I am particularly pleased at having seen. *Fratwan* is the Saxon word for adorning a building, and *fratw* for the ornament itself. From these words, *frette* is naturally derived—and *fratan*, meaning the teeth of fish, so nearly resembles them, that the triangular ornament of the Saxons most likely had its origin from the Saxon custom of stringing marine teeth.

## Points of View and Visual Angles.

C. R. COCKERELL.

"The architect," says Wren, "ought, above all things, to be well skilled in perspective, for everything that appears well in orthography may not be good in the model, especially when there are many angles and projectures; and everything that is good in model may not be so when built, because a model is seen from other stations and distances than the eye sees the building. But this will hold universally true, that whatsoever is good in perspective, and will hold so in all the principal views, whether direct or oblique, will be as good in great; if this only caution be observed, that regard be had to the distance of the eye in the principal stations." In this last particular the methods of the different masters have varied materially. For instance, Vanbrugh always supposed himself at a distance of 500 to 1,000 feet from his buildings, consequently his sky-line and contour are well studied, but his details wholly neglected, and the pleasing effect of his buildings in approaching them; whereas Adam supposed himself from 50 to 100 feet only from his buildings; consequently they have no contour from a distance, but are full of elaborate detail on the approach. The visual angle, extending at most to 45 deg., should be carefully applied to the points of distance, and the scale of the drawing or study should be correctly adjusted to this distance, so that no misconception should arise. A study for a building to be seen at 100 feet distance only will be on a large scale, and occupy the whole height of the paper, whereas, seen at 500 feet, it may be only one-fourth that size. The Greeks were consummate masters of this branch of optics, as we should doubtless have known had Aristotle's work on taste been preserved to us. The terms synoptic and eusynoptic correspond with the points of view which all their arrangements were calculated to afford. The Parthenon and the Temple of Jupiter Olympius—indeed, almost all the great temples—were approached on the angle, the peribolus and the propylea by which they were enclosed concealing great part of them, until they could be contemplated to the utmost advantage from a synoptical point of view. The plans of Palmyra and Baalbec and those of Rome, preserved to us by Palladio, are lessons in these respects demanding the most careful attention. It is obvious that street architecture, being seen chiefly in flank, should be treated otherwise than buildings at right angles with the point of view, as triumphal arches or terminations to the vista. In the fifteenth and sixteenth centuries perspective delineation became a new art in the hands of Lombardi, Bramante, Peruzzi, Raphael, and lastly the renowned Pozzi; and though Vitruvius assures us that in the fifth century B.C. Agatharcus wrote a treatise upon perspective, it is probable that the ancients never arrived at the skill attained by those masters. But perspective calculation applied to architecture, and the adjustment to the point of view was undoubtedly better understood practically by the ancients than ourselves, as their remains abundantly prove. The vista which shortens the length and discloses the end at once—the exposure of the entire object staring from a distance as well as near—the placing colossal objects in colossal places, are all modern mistakes. The temple at Luxor, the colonnade at Palmyra, are deflected in angles, so that the bounds are concealed, the successive columns disclose themselves by degrees, and the length seems interminable. The temple is partially hidden, and excites the imagination from the promise of its roof, entablature, and capitals, until it is permitted to be seen



in its overwhelming majesty. The columns of Trajan and Antonine are placed in confined positions, and the effect is tenfold. Palladio was remarkable for the adjustment of his building to the position, of which the Town Hall at Vicenza is one of the most remarkable examples. Vignola is said to have made his studies of his buildings at the points of view from which only they could be seen. It is quite certain that Sir W. Chambers was less master of this part of his art than of many others. Any one visiting the front of Somerset House, in the Strand, is satisfied with its scale and sufficiency in all respects; but when he enters the spacious quadrangle, and looks on the back of the same building, he experiences some disappointment—he finds the scale too small for the size of the quadrangle; but much more, when he observes the same proportions from the opposite side of the river, he deplors their littleness and want of mass and feature, the petty dome in the centre, and the confusion of chimney shafts which disfigure the roof. Had Vanbrugh disposed the river front, we should have seen those chimney shafts united in towers; the whole outline or sky-line would have been marked and varied with emphatic features, suited to the scale of the river and the majestic position given to the building.

#### Why Mortar Hardens.

G. R. BURNELL.

Until very recently it was held by most engineers and architects, by myself amongst others, that the solidification of mortars took place in consequence of the absorption of carbonic acid gas by the lime during the process of crystallisation; but it has been fairly objected to this theory, that the quantity of carbonic acid gas contained in the atmosphere which could be brought into contact with a large body of cement would not suffice to saturate the latter. The generally received opinion on the subject now is that limes harden simply in consequence of the combination with water which takes place during the slacking, and that the rapidity of the setting, and the permanence of the newly-formed hydrate of lime, depends upon its being combined with some other salt: the pure hydrate of lime in fact is soluble; the hydrated silicate of lime is tolerably insoluble, but it forms slowly; whilst the hydrated double silicate of lime and alumina, or of lime and magnesia, are practically insoluble. The facts actually observed seem to confirm these views, and they certainly enable us to account for not only the different modes of setting observable in different limes, but also for some of the more gradual actions which take place in that material, and the effects reciprocally produced by the mixtures of various ingredients. In the case of the now generally used Portland cements, and in that of underburnt lime, some very curious phenomena may however be observed, which appear to indicate that the simple laws mentioned above do not comprehend all the conditions which may arise; so that the above theory itself must only be considered as a step towards the attainment of a complete one of a more general character. The phenomena to which I thus allude are connected with the obscure subject of the chemical actions which take place under the influence of high degrees of temperature, and we shall have occasion to refer to them in the sequel.

#### The Treasures of Olympia.

E. CURTIUS.

The second temple in the order of size, though prior in time, is the Heraion, situated in the northern half of the Altis—a Doric temple, with six columns in front and sixteen on the sides. It has thrown new light upon the subject of the ancient temple architecture of the Greeks. Here is a building originally designed for the reception of votive offerings, and which accordingly had in the interior two rows of small chambers, like chapels. The entrance was in the southern long façade. In the lapse of centuries it was completely transformed, and we can see how the original wooden pillars were, one group after another, replaced by columns of stone. The entablature was probably always of wood, hence the extraordinary width (considering that the columns are Doric) of the intercolumniation of the portico. Henceforth the history of Hellenic architecture must begin from the temple of Hera at Olympia. Finally, the ground-plan of a third temple, surrounded by columns, has been discovered. This, the Metroön, or sanctuary of the mother of the gods, stood in the northern half of the Altis, just below the terrace of the treasures. This building we must regard as simply a place for keeping votive offerings. There were other buildings erected specially for the purpose of holding these votive offerings, namely, the *thesauroi*, or treasuries. Such buildings were familiar to us already from descriptions of Delphi and Olympia, but none had ever been discovered. Now the entire row of treasuries described by Pausanias is exposed to view, their main features preserved so far as they escaped ruin in Roman times. They were edifices built after the manner of temples, and two of the more important of them—namely, the treasury of the Syracusans, erected by them after the siege of Carthage, and that of the Megareans—are easiest recognised. The latter building had

one of its pediments decorated with a representation of the war of the giants, and of these sculptures considerable remains have been found. They display a style more ancient than that of the *Æginetæ*, and add materially to our knowledge of temple sculpture. Among the treasures must also be classed the Philippeion, the rotunda of marble built by Philip of Macedon after the battle of Chæronea, and which was filled with statues of his family. This is the oldest Grecian round temple whose date we are able to determine. Its ruins are in a tolerable state of preservation, and lie to the west of the Heraion, while to the east of the same the remarkable structure built by Herodes Atticus has intruded itself among the treasures. It occupies a semicircular niche cut into the foot of Mount Kronion, and was designed to hold a series of twenty-one marble statues representing the families of Antoninus Pius and Herodes Atticus. In two projecting round temples were statues of Antoninus and his wife Faustina. In front of this building there was a large walled basin, from which spring-water from the hills in the rear was conducted through the Altis. On the margin of this basin stood the figure of a bull, on which Regilla, wife of Herodes, had an inscription carved, to the effect that she, as priestess of Demeter, had consecrated the waterworks to Zeus. The building was an imposing structure, erected in the year 170, but it was impossible to complete it without injury to the treasures on each side. There is no doubt that one of the most notable buildings of Olympia, the double treasury of the Sikyonians, was destroyed to make room for it.

#### The Pont de l'Alma, Paris.

F. FOWKE.

The piers of this bridge are founded on concrete and masonry, laid by means of caissons, and such was the rapidity with which the rubble work of the arches and spandrels was executed that but three-and-twenty days elapsed from the time of commencing the springing of the arches until the opening of the bridge to the public. It must, however, be borne in mind that this opening for traffic took place before the ashlar facing was applied (this not having been carried up simultaneously with the rubble), before the centres were struck, the footpaths paved, or the parapets commenced. One of the most interesting points in connection with the construction of this bridge is the method employed for striking the centres by means of cylinders filled with sand; the employment of this method does not produce the slightest change in the construction of the centring itself, as the cylinder is simply substituted for the wedges on which the centres are supported. The apparatus consists of a cylinder of wrought-iron, 12 inches in diameter and 12 inches high, which is placed in a vertical position on a wooden platform, on which it is prevented from slipping by a circular piece of wood,  $\frac{3}{4}$ -inch thick, nailed to the platform, and fitting the interior diameter of the cylinder. Near the base of the cylinder, at four equi-distant points of its circumference, are bored holes an inch in diameter, which are stopped by corks introduced from the interior of the cylinder, which is then filled to within 2 inches of the top with sand previously dried and passed through a fine sieve; and into the space thus left is fitted a solid piston or plunger of wood, coinciding exactly with the interior diameter of the cylinder, and about 10 inches high; the whole apparatus, which is thus about 20 inches in height, is then introduced under the centres in lieu of wedges; and M. Bouziat, by whom this method has been invented and applied, gives the following account of the process of striking the centres:—"In striking centres, at a given signal, the corks closing the orifices in the cylinders are withdrawn by an iron rod a foot long and 0.31 of an inch in diameter, pointed at one of its extremities, and flattened and turned up at the other; the sand then issues slowly until it has formed a little cone opposite each hole, and stops. When everything is ready, the engineer gives the order to lower from  $1\frac{1}{2}$  to 2 inches; then, by means of the iron rods, the men remove the cones of sand, and help its escape with the curved end in the event of its having got wet during the process of the work, until the piston shall have descended the distance required, which will be noted by a scale attached to each piston. The workman then allows the little cone of sand to accumulate, and waits a fresh signal, and in this way the centre descends gradually, and detaches itself uniformly from the arch without shaking it. It will be seen that, being completely master of the operation, leisure is given to make all necessary observations, so as to be assured that all goes on well, or to take measures should the contrary be the case. At the Pont d'Austerlitz, commenced May 20, 1854, and opened for traffic on November 8, the centres were struck in two hours, and it might have been performed in still less time by placing a man to each of the cylinders, so as to lower all the centres simultaneously. Each arch of the bridge was supported by thirty-six principals, and the enormous weight of both the masonry of the arch and the metal of the roadway bore on the centres, they not having been removed until after the opening of the bridge to the public."



## NOTES AND COMMENTS.

M. JOSEPH ALBERT TOURNAIRE, a pupil of M. ANDRÉ, has been the enviable winner of this year's Prix de Rome for architecture. He is a native of Nice, and was born in 1862. M. SORTAIS, who is two years older, has gained the second grand-prix. He also obtains the consolation prizes of 2,000 and 500 francs. M. HUGUET was third in the competition. The subject assigned was a legislative palace. After his residence of four years in Rome, M. TOURNAIRE will receive 3,000 francs a year for three years—being a prize that was founded by the Countess of CAEN, who believed that assistance was never more welcome to an artist than during his early years of practice.

A CATALOGUE of engraved gems in the British Museum has been compiled by Mr. A. H. SMITH, in the Department of Greek and Roman antiquities. The bulk of the collection, over two thousand pieces, was formerly the property of the Duc de BLACAS, and of Signor ALESSANDRO CASTELLANI. It is now exhibited in the room adjoining the Department of the Coins and Medals. The Duke purchased the whole of the Strozzi collection, from Rome. The finest specimen in the collection is a head of AUGUSTUS, a sardonyx  $5\frac{1}{4}$  inches in length by  $3\frac{3}{4}$  inches in breadth. The ground, or layer of the stone out of which the head rises, is of a fine russet colour. A head of MEDUSA forms the centre of the shield which covers the breast. The Emperor has a band or fillet round his head, on which are various precious stones.

It is expected that the room in the Barbizon farmhouse which served as an atelier for J. F. MILLET will not be destroyed like the other parts of the house, but will be converted into a museum. But it can only have a circumscribed interest. Admirers of the painter will hereafter like to know what kind of rooms served for him during the time when he was not at his easel. The atelier is not the most interesting part of the house at present, and, when standing by itself, it will be simply a prosaic room. If the French Government interposed, the whole house could be saved; but that course will not be followed, as MILLET was never an official painter.

A MELANCHOLY account of the state of the woodwork in the Government House, which the Viceroy with his party was to occupy on the occasion of his visit, was furnished by a correspondent in Simla to a Bombay paper. The pillars supporting the galleries are of deodar instead of in teakwood, as they ought to be, and are all split and rotten-looking; the doors are falling asunder, or have never been properly fixed together; the window-frames, mantel-shelves, doorposts, lintels, pillars, and panels are all slanting in various degrees and directions, but are in many cases "off the level" to a very marked degree. The flooring is good in the Viceroy's study only. Everywhere else there are great gaps between the boards, in some of the staircases so wide as to admit of a finger being thrust between the planks.

THE Commission on Historic Monuments in France, of which PROSPER MERIMÉE was the first director, has exercised a sort of despotic sway over all the ancient buildings in France which can be supposed to possess an historic interest. Last year a law was passed which conferred on the Commission a control over buildings and other structures of less importance. An inventory is to be made—with or without the consent of the proprietors—of the objects which have any historic interest, and although the preservation or restoration of them does not devolve upon the State, it will be illegal for any one to alter them or repair them without the sanction of the Minister of Fine Arts. Furniture may be included among the historic works.

THE Parliamentary Buildings Commission of Melbourne lately recommended that Mr. KERR, who is the architect-in-chief at Parliament House with a salary of 600*l.*, should receive an addition of 400*l.* a-year on account of his work in connection with the new buildings. The Public Works declined to approve of the recommendation. The Parlia-

mentary Buildings Commission therefore resolved to solicit the Government to place a handsome sum on the Estimates as a gratuity to Mr. KERR, who has for many years back rendered eminent services to the State. The Commission also resolved to proceed at once with the carrying out of the alto-relievo designs by Mr. MACKENNA, awarding premiums to the following competitors for sculpture:—Bronze lion: First premium, 50*l.*, Mr. J. S. MACKENNA; 25*l.*, Mr. F. W. COMMONS. Allegorical figures: First premium, 40*l.*, Mr. M. B. FORTI; second premium, 20*l.*, Mr. E. R. KRETZSCHMAR. Alto-relievo panels: First premium, 20*l.*, Mr. A. B. MACKENNA; second premium, 10*l.*, Mr. E. R. KRETZSCHMAR.

A PORTRAIT of Queen MARGHERITA of Italy, painted and burnt in on glass by Professor MORETTI of Perugia, has been added to the many attractions of the Italian Exhibition in London. It has taken the artist two years of constant labour to complete this masterpiece, and the King and Queen of Italy on viewing it personally congratulated Professor MORETTI on his work.

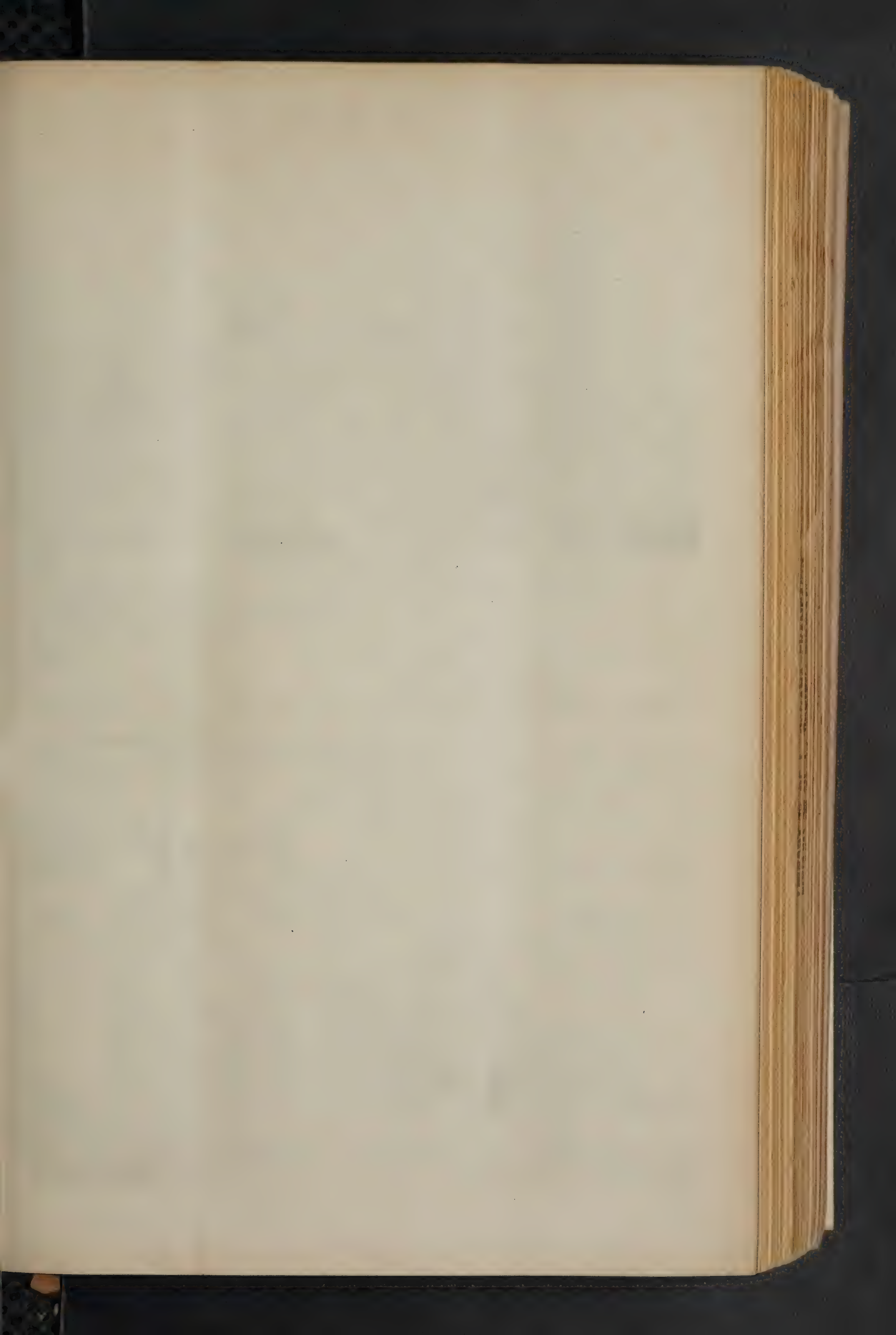
M. BOSSAN, of Lyons, who died recently at La Ciotat, was the designer of one of the most remarkable of modern churches. We refer to Notre-Dame de Fourvières at Lyons. In size it exceeds the cathedral of that city. It was commenced in 1876, but owing to the liberality of the citizens it was soon completed. The style is Romanesque, but the architect was not hampered by precedents, and it cannot be denied that many details are over heavy. The interior of the church is rich in sculpture.

THE British consul at Mollendo has sent an account of the starting of a limited liability company for working the old burial-grounds of the Peruvian Incas, and the authorities in Lima have, it appears, granted a concession for the purpose. It is supposed that the grounds will yield treasure in the shape of antiquities, valuables, &c. The prospective company, or "Licensed Society of Tomb-Riflers," for that appellation has already deservedly been used to describe them, it must be supposed will be more interested in making a dividend than in conducting archaeological research. The only valid reason for such searches is that they are likely to be fruitful in archaeological discoveries, and add to the store of historical knowledge. Explorations cannot be carried on without funds, but those who contribute money look for quite another return than cash for their investment; neither can explorations be conducted archaeologically except by trained men.

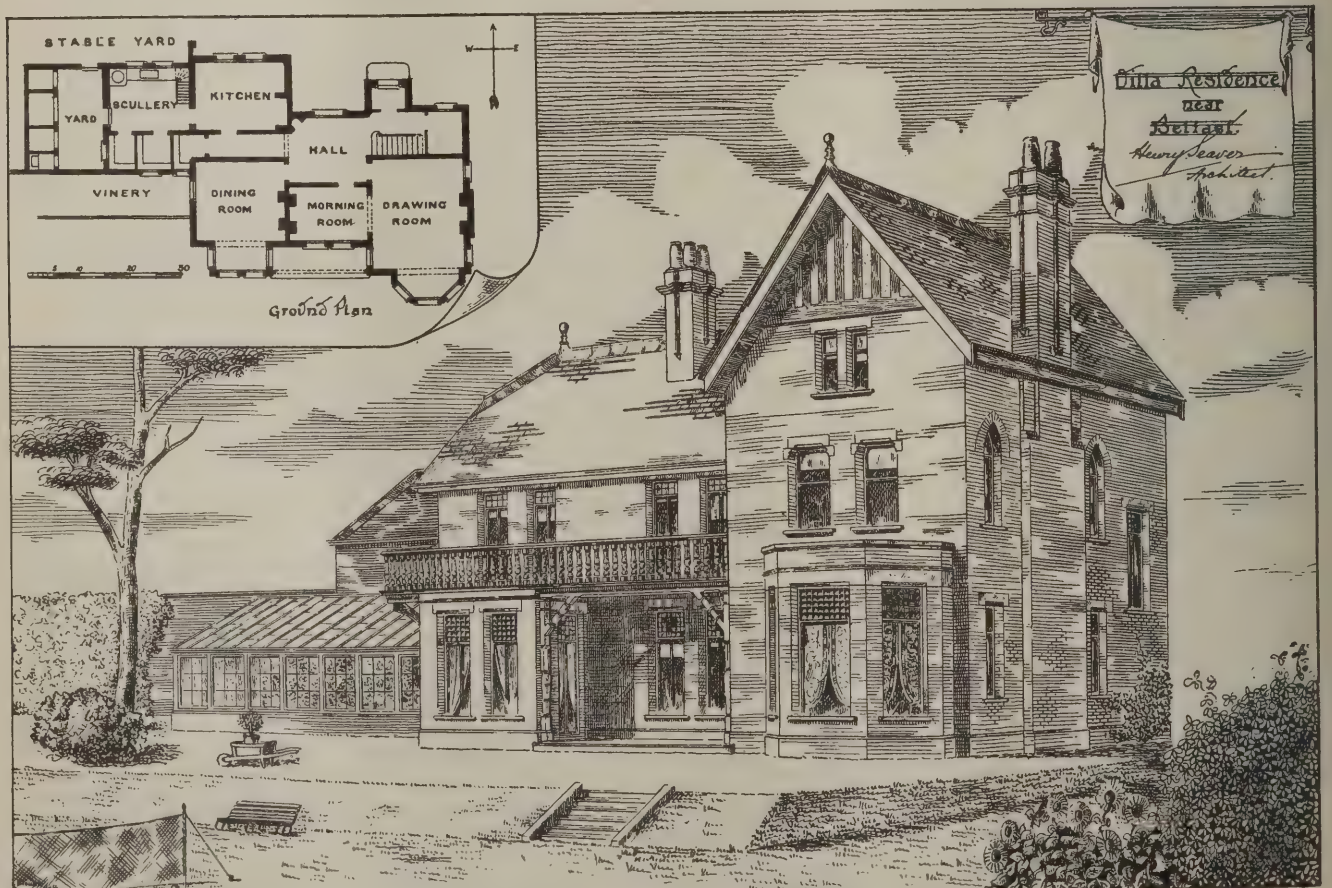
THE unearthing of the ancient amphitheatre in German Altenburg, a town between Vienna and Presburg on the Danube, is proceeding. As we stated a week or two back, the peculiar growth of the corn led to the discovery. It was the opinion of Professor HAUSER, who is conducting the Carnuntum exploration, that the corn-field covered the site of an ancient amphitheatre, the varied shades of green in the growing corn marking out the elliptical lines of the structure under the ground. The bottom of the arena has been reached, and a pavement found in perfect condition, and a paved road leading to the camp of Carnuntum.

A MEMORANDUM on the proceedings which are advisable in places attacked or threatened with epidemics, which has been drawn up by Dr. GEORGE BUCHANAN, F.R.S., has been issued to sanitary authorities by the Local Government Board. It is stated that it is of more than common importance that the statutory powers conferred upon sanitary authorities for the protection of the public health should be well exercised by those authorities, acting with the advice of their medical officers of health. The memorandum relates to occasions of emergency. Therefore the measures suggested in it are essentially of an extemporaneous kind; and permanent provisions for securing the public health have, in express terms, been but little insisted on. It is to be remembered, however, that, in proportion as a district is habitually well cared for by its sanitary authority, the more formidable emergencies are not likely to arise in it.

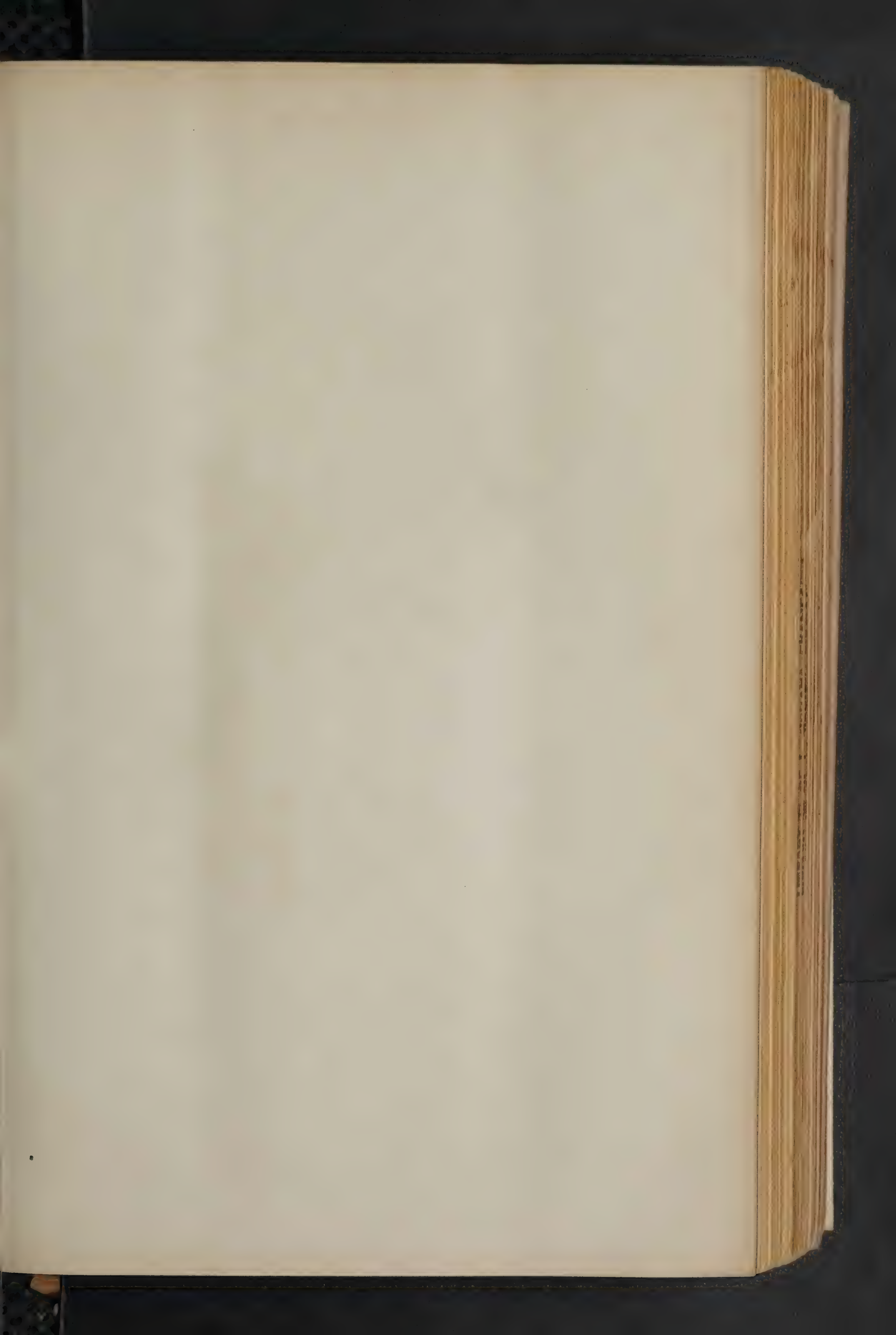






















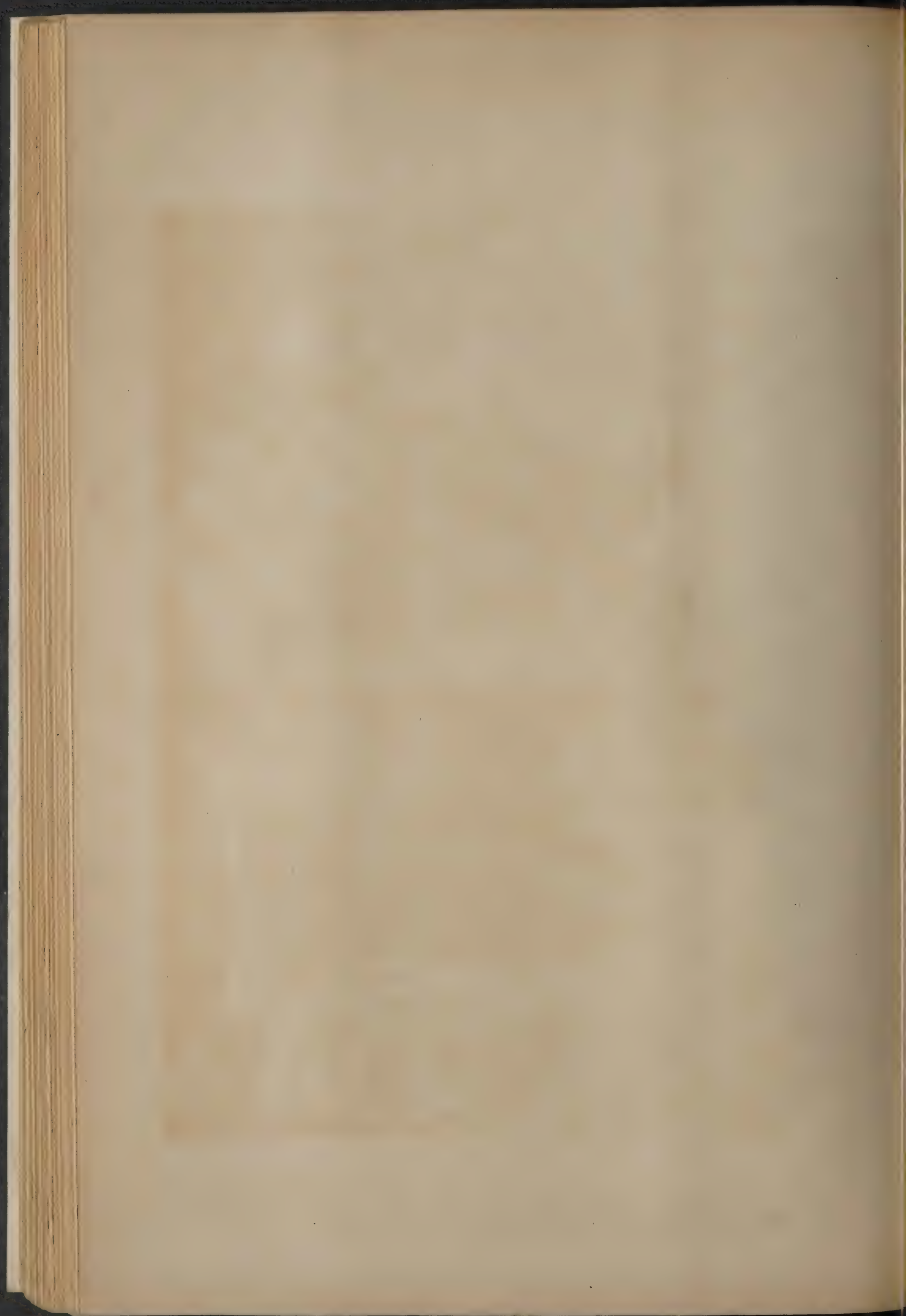






"INK-PHOTO," SPRAGUE & CO., 22, MARTIN LANE, CANNON ST., LONDON, E.C.







The Architect. Aug. 17<sup>th</sup> 1888.

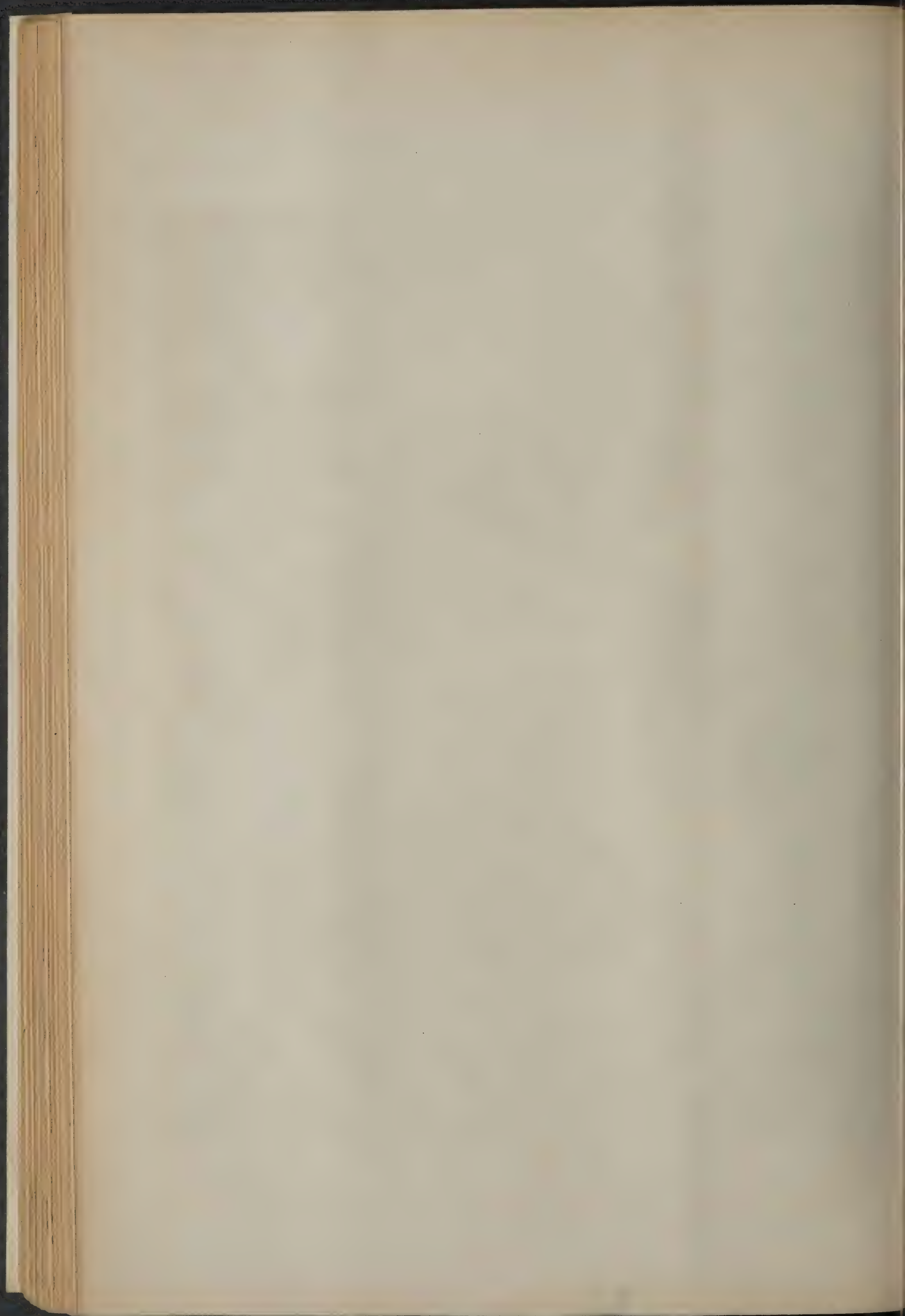


THE PHOTO. BRIDGE & CO. LTD. 15, WHITE ST. LANE, LONDON, E.C. 4.

HOUSE AT FALLOWFIELD, N<sup>o</sup> MANCHESTER - FOR DR. EMRYS-JONES.

EDWARD & FRANK HEWITT, Architects.

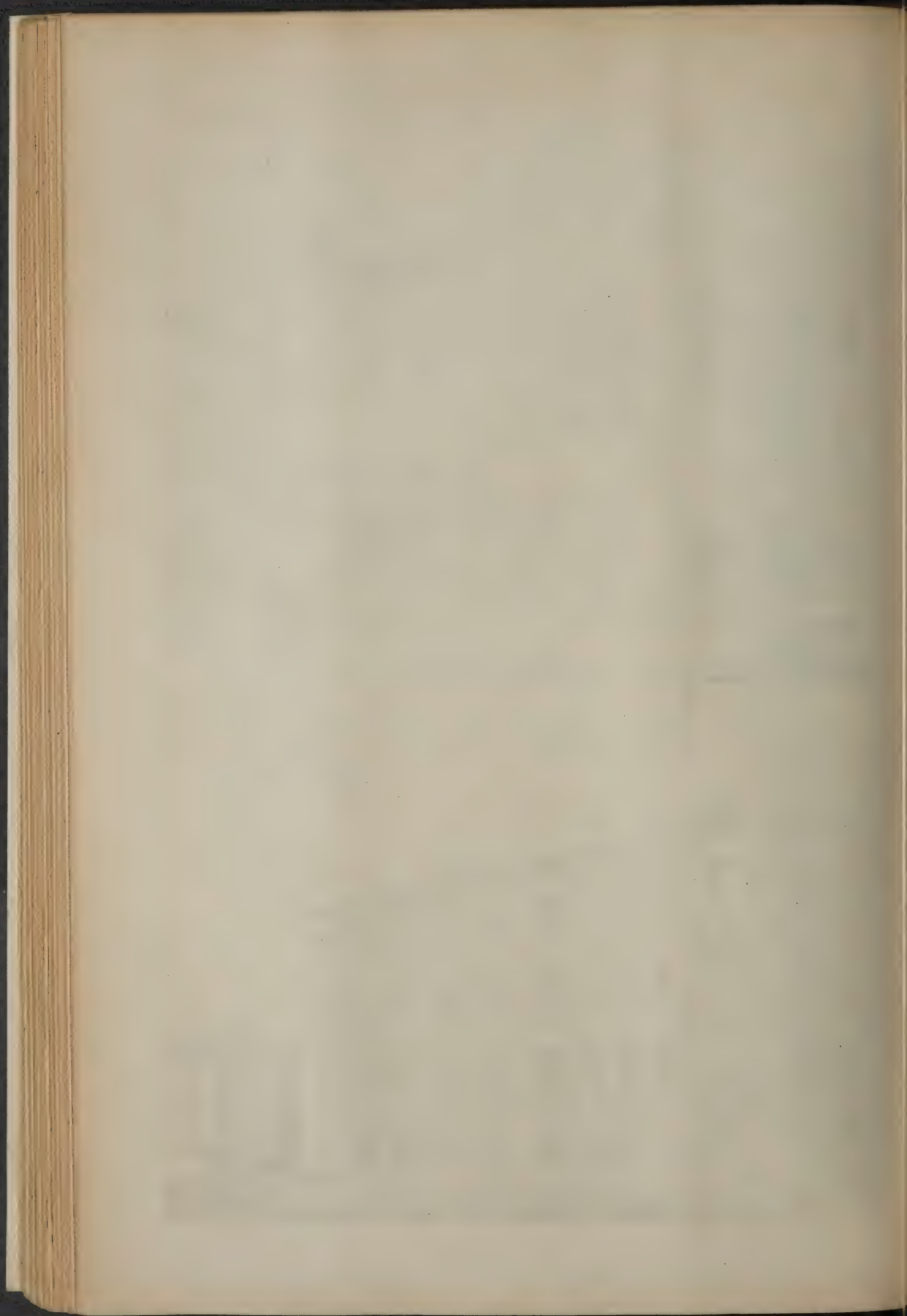














# ILLUSTRATIONS.

A COUNTRY VICARAGE, SAYERS COMMON, SUSSEX.

**T**HIS vicarage, which is now completed, has been erected for the use of the vicar of Sayers Common, a village a few miles from Brighton. It has been planned to afford as much convenient accommodation in accordance with the rules for parsonage houses laid down by the Ecclesiastical Commissioners as the funds available would allow; and as both this body and the Governors of Queen Anne's Bounty have contributed towards the cost, everything has been arranged to meet their requirements. The style is, as will be seen, an adaptation of the typical Sussex homestead pattern, the materials used being the local red bricks and tiles with oak barge-boards and fittings. The work was very satisfactorily carried out by Mr. NORMAN, of Burgess Hill, from the designs of Messrs. C. E. CLAYTON & E. BLACK, of North Street, Brighton.

HOUSE AT FALLOWFIELD, NEAR MANCHESTER.

**T**HIS house has just been completed for Mr. D. EMRYS JONES, and is situated in a finely-wooded position which adds considerably to the general effect. As will be seen from the plan all the entertaining rooms face south and west. It is from this aspect the drawing is taken. The external brickwork is built of picked white headers relieved with red Ruabon quoins—arches, strings, chimneys also being of red Ruabon. The plinth is formed of deep blue Staffordshire bricks, the roof being covered with EDWARDS'S red tiles, and ornamented with scalloped bands. The general contractors were Messrs. BROWN & SON, of Salford. The whole of the work (including internal fittings and decorations) was carried out under the superintendence of the architects, Messrs. EDWARD & FRANK HEWITT, of 9 Albert Square, Manchester.

## ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 12.—SAN BERNARDINO, PERUGIA.

A SUBURBAN HOUSE.

VILLA RESIDENCE NEAR BELFAST.

**T**HIS house, now in course of completion for the Rev. FRANCIS M. GRAHAM, M.A. (Oxon), occupies an elevated site at the Knock, Belfast, overlooking the Castlereagh Hills. The materials used in its construction are red perforated bricks from the Ormean works, with stone dressings from the Dumfries quarries. The internal joinery work is carried out in selected yellow and pitch pine. The contractors are Messrs. H. & J. MARTIN, Limited, of Belfast and Dublin; and the architect, Mr. HENRY SEAVER, of Royal Avenue, Belfast.

HOUSE AND SHOPS, HEADINGLEY.

**R**ECENTLY erected on the Otley Road, these premises are fronted with hammer-dressed wall-stones with Harehills dressings, and were built for Mr. JOHN RAYTON by Messrs. W. THOMPSON & SONS, the revolving shutters being supplied by Messrs. ATTWOOD & Co. Mr. T. BUTLER WILSON, of Leeds and Harrogate, was the architect.

UNION OFFICES, BLACKBURN.

**T**HESE offices, which are now approaching completion, have been erected from the plans and under the supervision of Messrs. STONES & GRADWELL, architects, Blackburn. The design was selected in a competition confined to the architects in the Blackburn Union, Mr. HIBBERT, of Preston, being the architect called in to assist the guardians in making a selection. The plans received the approval of the Local Government Board without any alteration whatever being suggested. Provision is made

The buildings being erected at Sundridge Park are for Mr. W. Drown, and not for Mr. Deacon, as stated in description of illustration in August 3.

for the clerk to the union and for the relief (indoor and outdoor) of the paupers of the union. There is a large Board-room to seat eighty-one, including officers and reporters. Adjacent to this room are committee-rooms for rural sanitary authority, assessment purposes, &c. On the top floor are offices, store-rooms, &c. Caretaker's residence is also provided. The front and return is all of dressed stone, the remainder of brickwork with stone dressings. Glazed bricks have been freely used, both for exterior and interior walls. The whole of the floors are fireproof, finished either with granite finish, mosaic or wood blocks. The heating is by means of hot water on the low-pressure system. The ventilation is being carried out by Messrs. ROBERT BOYLE & SON. The works have been carried out by local contractors. The architects are at present engaged in designing the furniture intended for use throughout the building, and the whole is expected to be completed this year.

## GLASGOW ARCHITECTURAL ASSOCIATION.

**A**T the monthly meeting of the Glasgow Architectural Association last week, Mr. J. Keppie, president, in the chair, a paper was read by Mr. A. N. Prentice on Early English Architecture. Mr. Prentice observed that as there were few remains of Domestic work of that period, he would confine himself to the Ecclesiastical. Taking Lincoln Cathedral as his model, he gave an interesting description of the various characteristic features of the style. In his remarks he made special reference to the importance attached to the western doors. Naves, arcades, screens, pinnacles, the iron hinges, bases, and the round abacus were subjects of instructive remarks. He dealt with the sculpture work, showing its claims to artistic merit, and of its importance to the buildings where it was found, generally being part of the design. Mr. William H. McNab opened a discussion, which was taken part in by a large number of members. The paper was illustrated by sketches and photographs. A hearty vote of thanks was awarded to Mr. Prentice for his paper.

## EDINBURGH UNIVERSITY.

**T**HE sanction of the Edinburgh Dean of Guild Court has been obtained by the Senatus Academicus of Edinburgh University to remove the iron railings and parapet wall at the South Bridge front of the University buildings, to make the space between the parapet wall and the wall of the building up to the present line of the footways, and to pave the new surface with natural-faced Caithness pavement or nidded white Hailes stone. Alterations—though not of a structural character, and therefore not requiring the authority of the Dean of Guild Court—on the Chambers Street front are also contemplated. The three bays placed at intervals about the first floor level of that front will be scabbled over and polished, while the joints and beds will be rusticated to correspond with the beds and joints on the east front. The ornamental string, which at present extends only to the bay nearest the South Bridge, is to be continued along the whole length of the line. In giving warrant for the South Bridge work, Lord Dean of Guild Gowans remarked that it would effect an immense improvement. The plans had been prepared by Dr. Rowand Anderson.

## BRITISH ARCHÆOLOGICAL ASSOCIATION.

**I**N view of the forthcoming congress of this Association, which is to be held in Glasgow, a meeting of the committee took place on Friday evening. Mr. John Honeyman, F.R.I.B.A., presided, and there were present Archbishop Eyre, Rev. G. S. Burns, Sir Michael Connel, Messrs. Mitchell, Scott, Conbrough, J. Dalrymple Duncan, Black, and Marwick. The Marquis of Bute, president of the Association, it was stated had received intimation that the Queen and the Prince of Wales had consented to become the patrons of the Glasgow Congress.

The draft programme of excursions and meetings was gone over and approved. On Monday, August 27, there will be a brief reception in the City Chambers, after which the visitors will proceed to Langside, where the Lord Provost will hand over the custody of the Battlefield Memorial to the Preceptor of Hutchesons' Hospital. The members of the Congress and others will be entertained to lunch by the Langside committee. The cathedral will be inspected, and its architectural features described by Mr. John Honeyman, president of the Glasgow Archæological Society. The opening dinner will take place in the evening. On Tuesday the party will proceed by train to



Bothwell Castle, and a visit will also be paid to Bothwell Church. The members will then go by train to Craignethan Castle, the "Tillietudlem" of "Old Mortality," on which a paper will be read by Mr. J. Dalrymple Duncan, F.S.A. Scot. At the evening meeting the inaugural address will be delivered by the Marquis of Bute, K.T., president of the Association. On Wednesday members and their friends will proceed by train to Larbert, where carriages will be ready to convey them to inspect the Tapock Broch, which will be described by Mr. Dalrymple Duncan. They will then drive over the Battlefield of Bannockburn to Stirling, where the castle, church, Argyle's Lodge, Mar's Work, and the other antiquities will be examined. Return to Glasgow by train in time for evening meeting in Corporation Galleries for the reading of papers. On Thursday the party will proceed by steamer to Rothesay. On arrival the ruins of the castle will be inspected and described by Rev. J. K. Hewison, M.A., F.S.A. Scot., and Mr. E. P. Loftus Brock, F.S.A. The members and their friends will afterwards be entertained to lunch at Mount Stuart on the invitation of the Marquis of Bute, president of the Association, and arrangements will be made to visit the standing stones of Lubas, the vitrified fort of Dunagoil, and the chapel of St. Blane. On Friday members and their friends will proceed by train to Paisley, where the abbey will be inspected, and its architectural features pointed out by Mr. E. P. Loftus Brock, F.S.A. The party will then return to Glasgow, and visit the collection of antiquities in the Bishop's Castle and the Hunterian Museum. Evening meeting in Corporation Galleries for reading of papers. On Saturday members and their friends will proceed by train to Doune, where the ancient castle will be inspected, and a paper on its history read by Mr. Dalrymple Duncan. The Roman Camp at Ardoch will then be visited and described by Professor Young, and by invitation of Mr. Matthew Bulloch the party will be entertained to luncheon at Ardoch House. An examination of Dunblane Cathedral, under the guidance of the Rev. A. Ritchie and others, will conclude the day's programme. On Monday members and their friends will proceed by train to Bonnybridge Station, whence the party will follow on foot the line of the Antonine Wall to Falkirk. From Falkirk they will go by train to Linlithgow, where the ancient palace and church will be visited and described. Closing meeting in Corporation Galleries at 8 P.M. On Tuesday, September 4, the party will visit Dunfermline, and in the evening the Association will be entertained at a conversazione by the Town Council of Glasgow in the Corporation Galleries.

#### PERMANENCY OF WATER-COLOURS.

SOME further notice of the report by Dr. Russell and Captain Abney in its scientific aspect may be interesting. In the analysis of white light by the prism, besides the radiations which are visible, and which are called "light," there are other radiations which co-exist with the visible radiations, and though invisible to the eye may have to be taken into account. Of these invisible radiations some lie beyond, or, as it is generally termed, below the red in the spectrum, and some beyond or above the violet. Those which are below the red, and have a longer wave length, experiment has shown to possess more energy or capacity of doing work than all the radiation ("light") above the red. As to how the comparative energies of the radiations, visible and invisible, forming the spectrum can be measured, it will suffice to say that by allowing the different parts of the spectrum (light and dark) to fall on an undecomposable substance (lampblack) which can absorb them all, or very nearly all, the measurement by thermo-electric means of the rise in temperature of the lampblack produced by the different parts of the spectrum gives a comparative measure of the energy of radiation of these parts. It must be remembered that the energy of the slice of white light decomposed by the prism, and which includes the invisible radiations, is the sum of all the energies of the different radiations of the spectrum.

The diagrams given in the report serve to explain the measurements. They show, for instance, the comparative energies at different parts of the spectrum of sunlight, the electric (arc) light, and an incandescent light which is the same as that of gaslight; the luminosity of the different rays of the spectrum of sunlight on a day in July, of the electric light, and of gaslight, showing the comparative brightness to the eye of the light at the different parts of the spectrum.

In the scale for the electric (arc) light is seen the portion of the curve of the visible part of the spectrum, together with its luminosity curve, showing that the brightness of the visible spectrum bears no sort of relation to its energy. The brightest part of the visible spectrum is in the yellow; whilst the point of maximum energy is just below the red. Had the luminosity and energy curves of any other source of radiation been used, exactly the same result would have been arrived at. Dark rays, when falling on a pig-

ment, behave in exactly the same manner as those which are visible; some disappear, and others are transmitted, and, though they give no colour to the pigment (it would appear of the same colour if they were excluded), are just as much in the reflected light as those rays which are visible. The light which is transmitted through a pigment is of the same general character as that reflected, and the same holds good for the dark rays. By the scale drawn up in the report an idea is given of the total rays which are transmitted and reflected by Prussian blue and carmine as measured, not by their brightness but by their energies, and it is seen that in the Prussian blue there are very few rays in the red, yellow, and green, which are transmitted and consequently reflected, but that in the dark rays again there is a transmission of radiation. In the case of carmine more of the red is transmitted, and less of the dark rays. The energy existing in the invisible region beyond the violet is very small, but since all radiation consists of a wave motion in what physicists have called the ether, it may happen, and does indeed happen, that the wave period of this portion of the spectrum is of such a nature as to cause a destructive vibratory motion on the atoms of the molecules of the pigment on which the light falls. This action had to be considered. All radiation, visible and invisible, is not reflected or transmitted through the various pigments, and the question arises as to what has become of the rays which are apparently lost. The radiation, which is not reflected from the colouring matter, has disappeared in passing through it; in other words, the pigment has absorbed certain of the radiations, visible and invisible, and with close approximation to the truth it may be said that the rays absorbed are complementary to those reflected. Hence in Prussian blue the rays absorbed are principally in the dark part of the spectrum, and in the red and yellow, and partly, but in a minor degree, in the green, blue, and violet. Similarly in carmine, the rays absorbed are principally in the dark part, the yellow and the green, of the spectrum, and less in the blue and violet of the spectrum. In the case of any body absorbing radiation, the energy so disappearing does work in that body, and in the case of chemical compounds, such as nearly all pigments in use are, there may be besides a chemical decomposition, which in colour means a fading or alteration. In estimating the chemical action effected on a body by radiation, there are two factors to be taken into account, viz., the intensity of the radiation acting, and the time during which it acts. To obtain the same amount of action in two cases, the product of these two amounts must be the same. Thus, if a certain tint be exposed to an intensity of radiation which may be called 100, and bleaches in it, say, one hour, then if a similar tint be exposed to an intensity 1, it will require 100 hours' exposure to it to effect the same bleaching. This has been fully proved by experiment. There is an idea abroad that if the light be very feeble a bleachable colour, no matter what length of exposure be given, will not fade. This, however, is not the case. The same proportion of the total energy absorbed by the body which, with an intense radiation, effects chemical decomposition, is expended with a feeble radiation in doing the same kind of work. To appreciate this, allusion is made to what the deductions from scientific experiment led the investigators to believe was the manner in which light acts on the molecules of which a body is composed.

In a compound body, the molecules must at the very least consist of two ultimate atoms, and these oscillate to and fro from one another, each atom having its own constant time of completing an oscillation, the molecule itself oscillating in a period of its own. The time of these oscillations is not to be measured even by millionths of a second, nor the extent of the oscillation by the millionths of an inch, but by standards far smaller. A ray of light of any pure colour is due to a continuous series of oscillations or waves of a known and measurable length in the physicists' "ether." If it happens that the time of oscillation of some "light" wave agrees with the time of oscillation of one of the atoms, the length of swing of the oscillation of this last is increased with each beat of the ether, till, if the number of beats of the ether be sufficiently numerous—that is, if the light be allowed to play upon the molecule long enough—the length of its swing is increased till finally the atom will swing off from the molecule, thus changing its composition. This liberated atom may join itself to the molecule of some other matter which may be present, such as oxygen or water. The amount of increased swing the waves of light can give the atom depends on the amplitude of the waves (the amplitude in a wave in the sea is the height from trough to crest), the square of which is a measure of their energy as it is of the intensity of the light. To take a very familiar example, suppose we have a heavy church bell hung without any friction on its supports, and without any resistance to its motion, and that when vibrating freely it would make a complete swing once in a second. Suppose to the end of the bell rope was attached a small horizontal plate, and that at intervals of a second 1,000 grains weight of water fell from a fixed height on to the plate, the bell would gradually oscillate.



and finally the oscillations would become so great that it would ring. If instead of 1,000 grains falling from the same height we had one grain of water falling every second it would take 1,000 times longer before the bell rung, and if it was  $\frac{1}{1000}$  of a grain of water that fell every second it would take 1,000,000 times as long before it rang. The work done by the dropping water may be looked upon as the work done by the amplitude of the wave, and the church bell as the atom, moving without friction and without resistance.

It will also be noticed that it is only those rays whose waves beat in unison with the oscillation of the atom which increase the swing of the atom. The wave motion is then destroyed, and that particular ray disappears, *i.e.*, is absorbed. It must be recollected that the visibility of any change effected on a body merely means the number of molecules altered. In feeble light the numbers altered in a given time are much fewer than when light is intense. We have a good instance of this in a photographic plate, where the effect of the exposure for  $\frac{1}{100000}$  of a second to sunlight on a salt of silver is invisible to the eye, whilst a second's exposure is rendered visible. We know, however, that  $\frac{1}{100000}$  of a second's exposure to sunlight has chemically altered some minute portion of the silver salt on which it fell, as what is termed development proves it. Again, we have a further definite proof in the case of certain colours that the smallest intensity of radiation if sufficiently prolonged effects a chemical change in them. In photographic processes the chloride of silver is only sensitive, roughly speaking, to the extreme violet of the visible spectrum. When any one of certain colours which are fugitive are applied to stain the silver chloride, and the part of the spectrum which the colour absorbs is below the violet, then after exposure in the spectrum on applying a developer, as it is called in photography, the action of the spectrum in decomposing the colour of the dye is shown by a deposit of silver taking place in that part which the colour absorbs. Thus, if carmine (cochineal) be applied to the chloride of silver an action will be shown to take place in the green where the colour, as will be seen, absorbs. It must be remembered that without that colour no such deposit would be possible. The spectrum of sunlight will cause this phenomenon to appear in a few seconds, and the spectrum of skylight, or of candle-light, will equally cause it if the exposure is prolonged. That is to say a feeble radiation (light), if sufficiently prolonged, will give the same effect as a radiation (light) which is several thousand times as intense. And it further demonstrates that chemical decomposition takes place in a colour long before such change is visible to the eye.

The heating effect on a body may be taken to be an increase in the amplitude in the oscillations of the molecules rather than of the atoms (though the two are closely-connected), pointing to the fact that the shorter wave-lengths which have a greater rapidity of oscillation are those which would be most likely to increase the amplitude of the oscillations of the atom and thus to produce a chemical change in the body.

In analysing by a prism the different kinds of light, it is found that in the visible spectra so obtained no colour is absent, but on comparing the intensity of the same colours in the different spectra it is found that there is a variation. Comparing the spectrum of sunlight at midday in May with gaslight, it is found that there is considerably less violet, blue, green, and yellow light in the latter than in the former, and in light from a blue sky considerably less red and yellow. The intensities of the spectrum colours of sunlight near midday in May are not very different from those of the electric (arc) light, while the intensities of the colours of the incandescence electric light when rendered normally incandescent are a very close approximation to those of gaslight. The light of the gas, and therefore of the incandescence electric lamp, is yellower than that of sunlight, and therefore of the electric (arc) light, owing to the increasing diminution of comparative intensity of the colours from red to violet, whilst the light from the sky is considerably bluer than that from the sun. It has been recently shown how by cutting off the electric arc light (or from sunlight of known composition) the proper proportions of the different spectrum colours, the exact hue of gaslight or skylight can be produced. The difference in hue of the light from any of the sources considered is due to an excess or defect, but not to a total absence of intensity of the different parts of the spectrum. As regards the dark rays of the spectrum the same argument holds good. A diagram is then given which shows clearly the different proportions of dark rays in sunlight, the arc light and gaslight. In light from the blue sky the proportion of dark rays is much smaller, and no very accurate measurement of their intensity has been made, but as the rays below the red do not cause chemical change in any of the pigments tried, this want of accurate knowledge is of no great moment.

Since, then, all sources of light emit the same rays, but of different intensities, which can be measured, it follows that if we know which rays are chemically active, and the amount of work which, when of a certain intensity, they perform, we can,

from the work done by the light from one source, deduce the work that would be done by another. The most perfect manner of noting the action of light would be to expose for a given time the pigments to the action of the spectrum formed by an unvarying source of light, and to measure the amount of chemical action (fading of the colour in most cases) which had taken place in every part of the spectrum. When the relative intensities of the different parts of the spectra from other sources of light compared with this standard spectrum were known, then the length of time during which it would be necessary to expose the colour to any one of them to produce that same total effect could be calculated. Unfortunately for the experiments, even in full sunlight, which is the most powerful light to be worked with, months are often required to effect a visible chemical action on some of the pigments; it was therefore useless to take a narrow slice of light, say  $\frac{1}{10}$  inch in width, and  $\frac{1}{2}$  inch in height, and form a spectrum with it on a surface of coloured paper 4 inches in width and  $\frac{1}{2}$  inch in height, and wait to see when the bleaching took place.

To avoid this impracticable method resort was had to the use of coloured glasses to ascertain the part of the spectrum which was most active in producing the fading action. The glasses used were red, green, and blue. It may be well here to say something regarding what is meant by the terms red, green, blue, &c., as applied to glasses. It is a very popular idea that light coming through coloured glass is really white light, which is in some way transmuted into red, green, blue, &c., as the case may be. There is no transmutation. The effect of colour is merely produced by the abstraction of certain rays, or of a proportion of them, from the white light by the material of which the glass itself is composed.

In this case practically the visible spectrum was divided into three parts, and in every case where any fading took place it was always found beneath the blue glass, very much less often and to a far less degree under the green, and only twice under the red glass, and was then barely perceptible. The blue glass also allows most of the dark rays beyond the violet to be transmitted. Experiment has shown that these rays are chemically active, but not to the same degree as those which are visibly transmitted through the blue glass. This might be expected, as their energy or capacity of doing work is far less.

As to the proportion of dark rays which pass through the different glasses, they are nearly entirely transmitted through the red glass, very slightly through the blue and green glasses. Had the fading of the colours we have examined been due to the dark rays, it ought to have been shown beneath the red glass far more than under the green or the blue glass. This was not. Therefore, it may be said that the blue, violet, and ultra-violet rays are those which are by far the most active in producing a change in the pigments experimented on. As the intensity of the different rays of the spectrum coming from the different sources of light have been measured, it follows that the total intensity of the rays from each source of light transmitted through the blue glass can be calculated. These total intensities may be taken as a close approximation to an inverse measure of the time to which the colours would have to be exposed to produce an equal result as regards fading.

It might properly be objected that although it has been shown that the dark rays do not affect chemical decomposition, it has not been proved that the heating effect they have on a pigment might not aid the rapidity with which the decomposition takes place. Direct experiments were undertaken with this object in view. The backs of papers coloured with pigments proved in the investigation to be fugitive were placed in contact with a tin containing boiling water and exposed to light, together with similar papers merely resting against wood. Some few of those colours which are affected by heat without light in an atmosphere saturated with moisture did fade with very slightly greater rapidity where exposed as above, but with the majority the rate of change was, if anything, slower. Further experiment has also shown that if the dark rays be cut off from sunlight by proper means, the rate of fading in colours freely exposed is not diminished. In the experiments in the open tubes, which were described previously, the temperature was only a very few degrees higher than the temperature of outside atmosphere, and therefore the experiment made by heating the pigmented paper by contact with a vessel at the temperature of boiling water was an extreme example of the effect of heat. The results of experiments show that damp is often a factor in the rapidity of fading, and as heat tends to lessen the moisture present in the paper and pigment, it might be expected that in the majority of cases fading would result more slowly when the pigment was heated, whether by radiation or by heat applied as above.

That fading should principally take place in the blue rays was to be expected, from experiments that have been conducted with other objects, and is of great practical importance. It has been already stated that it is only those parts of the spectrum which are absorbed by a colour that can do work on it. Of all colours, the reds, yellows, and greens absorb principally in the



blue part of the spectrum, and the blues much less. Hence we may expect that the former pigments would fade more rapidly than the latter if they are fugitive. And, what is more important, it locates the action of the spectrum to the region which is least luminous, and which varies enormously in the different kinds of light to which pigments are exposed. Of the different kinds of daylight, viz., sunlight and skylight, to which water-colours are exposed, sunlight is the safest when reduced to equal intensity, since it contains a far less proportion of blue light than does skylight.

From a consideration of the amount of exposure given to the pigments is deduced, within limits, the time that would be taken to produce a similar effect in the light to which they would ordinarily be exposed. Between the middle of May to the middle of August, that is, from the time when the exposures were first made to the time when the first series of readings were made, there was registered at Kew Observatory 705 hours of bright sunshine, and at Greenwich 652. We may therefore take it that there were about 675 hours of the same bright sunshine at the place in which our colours were exposed. Not only, however, did they receive this sunshine, but also the light from the sky. The total number of hours of effective daylight which they received in the same time was about 1,700 hours. A fair comparison can be made between sunlight and skylight from the results obtained by experiment. When the sun is bright, we may take it that the sky is not overcast, but is fairly clear, and if, by photometry, we may measure the brightness of the total light from the sky and of sunlight, and of the skylight separately when illuminating a surface placed vertically, and facing the direction towards which the papers were exposed, we can calculate the ratio of the brightness of sunlight and skylight. It would be manifestly of little use to take measures of the whole of the components of the light, for, if we take a unit of light of blue sky and a unit of sunlight, we have much more blue light in the former than in the latter. And, as it is the blue rays that have been shown to be effective in acting on those pigments which do fade, the photometry had to be confined to these rays alone. The average intensity of the blue rays in direct sunlight (*i.e.*, with the receiving surface held normally to the direction of the sun's rays, is attained very nearly at 330; thus in the middle of August it is about 63 of that of the maximum. In the case of the tubes, however, the pigments were not exposed, so that the surface was normal to the direction of the sun's rays, but always with the surface vertical. As they were cylindrical, it might, at first sight, have appeared to be a matter of some difficulty to say whether the photometric measurements should be made with a vertical surface facing east, south, or west. A reference to the tubes themselves, however, solved the question, as it was found that the greatest fading took place in that part of the paper which was parallel to the building against which the tubes were hung, and it was this direction in which the surface of the photometer to be illuminated was placed. The conditions of exposure required that the effect should also take into account the reflection from the glass, and this was duly attended to. As a result, it was found that though the illumination by the sun near mid-day of a vertical surface facing 20 deg. east of south was on an average nearly 4.5 times more intense in blue light than was the sky, yet there was a steady diminution in the ratio after about three hours on each side of when the maximum was attained, owing to the greater inclination the paper had to the solar rays and also to the increased reflection from the glass from the same cause. It may be fairly taken that the average intensity of the blue of sunlight throughout the day is close upon 275 that of the average light from the sky. Although the sun soon after its rising shone upon the pigments, yet at about 3.30 in the afternoon they were shaded from the sunlight, and this reduces the number of hours' sun which they received to about 500 hours. The above average value of sunlight to skylight was taken with a knowledge of this fact.

The conclusion is thus arrived at that when the sun was shining for 500 hours, the pigments received blue light equal to 1,875 hours of that of a blue sky fully illuminated when the sun shone on them. Besides this, the pigments received 200 hours of blue sky towards sunset when the colours were in the shade, which may be taken as about equal to 50 hours of average skylight illumination. The light from a sky which is cloudy has very much the same composition as sunlight itself, as repeatedly proved. Supposing, however, that the light was half due to blue sky and half to that of sunlight, this is equivalent to the pigments being exposed for 600 hours to light of the same composition as that of a blue light from the sky and 600 hours to light of the same average composition as sunlight. Now for equal units of illumination skylight is almost exactly twice as rich in blue rays as is sunlight. Therefore, the 600 hours to which the pigments were exposed to degraded sunlight is equivalent to 300 hours of light of the quality of skylight. Hence it may be taken that the pigments were exposed when the sun was not shining to 900 hours of light of the same quality as that coming from the blue sky, but inferior in illumination. Measures taken

show that the light coming from the sky at the time of year when the exposures were made varies from  $\frac{3}{4}$ ths to  $\frac{1}{10}$ th, and sometimes less in brightness of that coming from an unclouded sky, the measurements being taken at the same time of day. If we assume that the average illumination of an overcast sky is  $\frac{1}{10}$ th of that of a blue sky, we shall not be far wrong. Applying this factor, we find that the pigments were exposed for an equivalent of 300 hours of average bright blue sky beyond that to which they were exposed when the sun was shining. It may therefore be said that the pigments received a total illumination equivalent to 2,225 hours of average blue sky, which is made up of the 1,875 hours, the 50 hours, and the 300 hours. This of course is only an approximate estimate, owing to the very variable quantities dealt with, but still it will give an idea of the illumination by the blue rays which were effective in causing the fading. A calculation is made as to the approximate amount of illumination which a picture hung in a gallery, such as those at South Kensington, would receive during the same period. No direct sunlight would be admitted, and therefore the illumination due to the direct light from the sun would be eliminated. Photometric measurements show that the blue light illuminating a picture in these galleries varies between  $\frac{1}{10}$ th and  $\frac{1}{20}$ th of that to which it (when no blinds are used for subduing the light) would be subjected if it were placed where our pigments were exposed and illuminated by the sky alone. When there is a blue sky the ratio is least, and we shall be safe in taking it as  $\frac{1}{10}$ th. For the 700 hours when the sun was shining we should, therefore, have an equivalent inside the gallery to about 9.3 hours of average blue sky. For the 1,200 hours of light from an overcast sky we may take the factor of  $\frac{1}{10}$ th both for the 600 hours of light which was of the quality of light from a blue sky, and also of the light for the 600 hours, supposed to be of the same quality as of sunlight, which, both together, were taken to be equivalent to 300 hours of light from an unclouded blue sky. This would give an exposure equivalent to 7.5 hours of the average light from a blue sky, such as that to which the pigments were exposed, or in all 16.8 hours. This would make the exposure of a picture inside the gallery about  $\frac{1}{130}$ th of that given to the pigments during the same time. If the whole year was of the same daily average brightness as that between May 15 and August 15, 1886, the same effect would have been produced on the pigments located against the walls of one of these galleries in about 32 years. Seeing that the daily intensity and continuance of light is so enormously diminished in the autumn and winter, it will not be overstating facts when it is said that it would have taken 100 years in the gallery in question to have arrived at the same degree of fading as to that to which the pigments had arrived by the sunlight experiments up to August.

A calculation is made as to the amount of exposure to gaslight, or light from electric glow-lamps falling on walls of the same gallery. The glow lamp and the gaslight have very closely the same composition, and it may be taken that the mean illumination on the walls lighted by gaslight and electric incandescence lamps is equal to two candles at one foot off. The illumination of the same galleries by daylight has been measured, and the mean light for the whole year may be taken at about six candles at one foot off. Details of the candle value of the illumination for the brightest months in the year have been given. The illumination in the winter months is so small that this average may be taken. That is, the mean illumination by day is three times better than by night, but the blue rays in one unit of the illuminating value of light of gaslight are only  $\frac{1}{10}$ th on cloudy days to  $\frac{1}{20}$ th on days when the sky is clear of those contained in a unit day light. We may take  $\frac{1}{10}$ th as a probable proportion, and on this assumption the blue light illumination by the latter is about  $\frac{1}{10}$ th of that of the former. That is to say, that one hour's exposure to mean daylight is about equal to 45 hours of gaslight. It has already been estimated that to produce the fading which took place in the colours between May and August in direct sunshine, at least 100 years would have been required had the exposure been made in the gallery. Allowing for the duration of darkness, it would have taken at least 2,000 years continuous illumination to have produced the same result in gaslight or in the light from the electric glow-lamps. With the arc electric light giving an illumination of 2½ candles at one foot off, we calculate, on similar data, that the same result would have been obtained in not less than 200 years.

#### THE CHANNEL TUNNEL WORKS.

A REPORT on the state of the Channel Tunnel works, made to the Board of Trade by Major Marindin, has just been published as a Parliamentary paper, being dated July 17, and is as follows:—

In compliance with the instructions contained in the order of the 5th instant, I have this day made an inspection of the



works of the Submarine Continental Railway Company, near Dover.

I was accompanied by Mr. F. Brady, the engineer of the company, who made all possible arrangements to facilitate my work of inspection.

I was informed by Mr. Brady that, although the boring machine, which is still in position at the end of experimental tunnel, has been periodically worked so as to keep the machinery in proper order, no cutting operations have been carried on except upon occasions when permission has been obtained from the Board of Trade.

I find that since the date of my last inspection, in December 1886, permission was given upon August 10, 1887, to work the machine upon the following Friday and Saturday (see H. 5,787), and the measurements taken by me to-day, compared with those taken in March 1885 and December 1886, show that only eight inches of chalk have been cut out since the latter date. This amount of cutting is not more than might reasonably be made under the above-quoted sanction.

The length of the tunnel having been thus increased by eight inches since December 1886, is now 2,102 yards 2 feet 8 inches, or, say, 2,103 yards.

The ventilating heading from the tunnel to No. 3 shaft, sanctioned by the Board of Trade on May 14, 1886 (H. 2,846), has not been commenced.

The tunnel, although a good deal of the timber sheeting at places has had to be renewed owing to dry rot, is in much the same condition that it was in December 1886, but, if anything, it is rather drier.

The pumps are worked twice a week for about three hours, and the amount of water which collects in twenty-four hours is calculated at only about 440 gallons.

The ventilation is carried out, as heretofore, by the use of compressed air whenever necessary.

The boring operations for coal on the under cliff close to No. 2 shaft are being pushed forward. The bore-hole from the bottom of a shaft 44 feet deep is now about 900 feet deep; the first 500 feet, 18 inches in diameter, being lined, and the remainder, 15 inches in diameter, being as yet unlined.



#### A Royal College of Architecture.

[SIR,—So our discussion upon the establishment of a national scheme of architectural education is to conclude, and I am afraid I am just as sceptical of its possibility as I was before it began. Mr. Thomasson's failure to explain away my objections has, I fear, made them doubly strong. Why does he not give us some details of the finances? Why does he not distinctly state who is to organise and carry out this scheme? And why does he not even attempt to respond to my invitation to form a local society for his own town? Because, sir, directly he tries to reduce his scheme to a practical workable form, he finds himself confronted by a host of difficulties. I know what they are, because I have gone through it all, and although I was just as eager and just as confident as Mr. Thomasson when I first conceived the idea, yet the enormous difficulty of carrying it out convinced me that such an organisation was not possible in the present state of architectural education. And this discussion has strengthened me in my conviction.

Nevertheless, now that the question has been fought out in words, and that my objections have not apparently shaken Mr. Thomasson's faith, let him turn his attention to deeds, and set to work to put his scheme into working order. After he has done so, I would suggest that he lay the whole matter before the Council of the Royal Institute of British Architects, where I am sure it would receive a very courteous reception and a complete and impartial investigation. And then, if I am proved to be wrong, I shall be the first to own it. I am sorry that Mr. Thomasson thought fit to write his last letter in the tone he did. We are fellow-workers in a good cause, and after all it is only the means, not the end, that we are disputing about. So now that our wordy war is over, let us metaphorically shake hands, and forget any hasty remarks that may have seemed to us uncalled for.

For ourselves in the Association, we also will continue our labours to perfect its organisation and make it a worthy college of architecture. As one little example, I may mention that next winter the committee is going to appoint a committee of inquiry to investigate the merits of a scheme of education in construction and architectural science that will, if passed, be of immense value to the profession as a whole, and then the youngest pupil will be taken in hand by competent teachers and trained on year by year, until he is able and ready to present himself for that final ordeal for which every true and loyal

architectural student is, I hope, preparing himself—the R.I.B.A. examination.

Believe me, Sir, there is a very strong feeling in the Association in favour of a more collegiate leavening of its institutions, and if your original correspondent would only lend us a helping hand in our endeavours, instead of starting a new college, I know he would earn for himself among our students a popularity great indeed.

In conclusion, I must give you, Sir, my very warmest thanks for permitting me to occupy so much space in your journal, but I hope and believe that this discussion will be of real benefit in showing to the world that Englishmen are at last determined to set their house of architectural education in order.—Faithfully yours,

OWEN FLEMING.

London: August 11, 1888.

#### Theatre Exits and Fire Risks.

SIR,—Having read your notice under the above heading which appeared in your issue of the 10th inst., I cannot help commenting upon the apparent belief, still reposed by theatrical architects and managers in materials which, though incombustible in themselves, are yet great absorbents of heat and subject to the influence of it. For instance, iron and concrete, though incombustible in themselves, are most pernicious materials when used in the construction of a building, particularly when the one is employed in conjunction with the other; and there is not the slightest doubt that the combination of iron and asbestos, when used as a fireproof proscenium curtain, though the action may be different when it is subjected to extreme heat, say in the case of fire, cannot possibly be effectual in preventing the spread of a conflagration from the stage to the auditorium.

It is a well-known fact that asbestos becomes incandescent when subjected to flame, and any material that can be rendered incandescent must be a conductor of heat. Iron when subjected to extreme heat rapidly expands, and, when built up into a kind of framework, very rapidly becomes distorted through unequal expansion; and I will say if a framework of iron and asbestos cloth be employed as a fireproof drop curtain for a theatre, that in event of fire the curtain will be rendered useless through "buckling" and warping.

It stands to reason that what really should be employed by theatrical architects and managers in the construction and fireproofing of theatres are articles which are not simply incombustible in themselves, but materials which will not become incandescent or transmit heat in such a way as to influence combustible materials in close proximity to them.

I need not say that such materials are at the disposal of any architect who wishes to make use of them, as that is now a well-established fact; but, obviously, what is required is to bring before the notice of those personally concerned, viz. the theatre-going public, the fact that theatres can (though at present they certainly are not) be made perfectly fireproof, and that there is no reason whatever why the life of a single theatre-goer should be risked.

PAUL LAMBERTS.

August 15, 1888.

#### Contrast or Harmony?

SIR,—The letter of your correspondent "In a Fix" draws attention to a subject which now and then forces itself upon observant minds. His case is that, having erected an extension to an Elizabethan house greater than the old part, with stone from the same quarry as that used in the old part, his client complains that, whereas the old work is of a beautiful dark-grey colour, the new is of a very light but agreeable tint, and proposes to reface the old work to match the new, or darken the new work to match the old.

Two or three years ago I was with some archaeologists in Sussex, and directed their attention to the following incident. There were, side by side, two fifteenth-century windows, in every minute particular of design and detail precisely alike. One was the original window, the other a new one put in by Sir Gilbert Scott, probably replacing the old decayed one. The old window instantly arrested attention, and we desired to sketch it, but the new one we should pass by as an ordinary piece of work. Now the whole secret of this was the effect of time. Time had mellowed down to a "beautiful dark-grey colour" the old window, while the new was comparatively harsh and bald. It, however, seemed to say, "And why not sketch me? What has my old neighbour done that you should bestow such loving glances upon him, and pass me by with contempt?" And so it can be said of many Elizabethan and Queen Anne houses. I suppose no one would be more astonished than the designers of those houses to find such praise bestowed upon them. The pleasure derived from them is not due to design, nor to building; it is wholly due to time. You may make at the side of any of them an exact counterpart, but you will not obtain a tithe of the beauty. Good old paintings are not better painted than good new ones; and when



time has flatted the varnish the present new ones will be as much glorified as the old ones. I said the same a little while ago in the columns of the *Times* as regards the work of Lord Grimthorpe at St. Albans Abbey. When time has mellowed down his new work it will look quite as well, and in many cases better than the old, but impatient persons demand the effect of three or four centuries in three or four weeks. The client of "In a Fix" should do what his predecessor did—let the work alone. To reface the old work would be to irreparably destroy its acknowledged beauty; to darken the new would be a sham which would make client and architect contemptible. The architect has done his work, the client has done his; let time do the remainder.—I am, your obedient servant,  
7 Duke Street, Adelphi, W.C.: WM. WOODWARD.  
August 15, 1888.

#### Italian Vandalism.

SIR,—The *Saturday Review* of last week, commenting on a pamphlet by Signor Antonio Palomes, entitled "Civilisation (?) Memoirs for the History of Our Own Times," draws attention to the numerous acts of vandalism which have taken place in Italy since 1865, and makes the astounding statement that during the past hundred years that country has certainly lost more than half of her ecclesiastical and civic monuments. The church of St. Dominic, at Brescia, which was pulled down in 1880 to make room for a new railway-station, supplied the Brompton Oratory with the sumptuous altar of the Rosary. The South Kensington Museum contains all that now remains of the church of the Misericordia and the fine conventual church of Santa Chiara at Florence. Palermo has suffered not only from the destruction of many of her finest churches, but from the injudicious restoration of those which remain. Signor Palomes assures us that there is a good deal of suspicious mystery hanging over those acts of vandalism, and he does not hesitate to hint that even conspicuous personages could if they chose tell us a good deal that is curious concerning the proceedings, and convince us that Mercury himself was the god who presided over many a sale of church and municipal plate. The English have been frequently reviled for the interest they have taken in the preservation of Italian antiquities, and it is satisfactory that this interest is shared by some of the Italians themselves, although unfortunately they are at the present time in a minority. J. H.

#### CHURCH BUILDING AND RESTORATION.

**Harrogate.**—The memorial-stones of a new Wesleyan chapel and school were laid at Starbeck, Harrogate, on Monday, August 13. The chapel is 41 feet by 31 feet, with vestibule and lobbies; the school 27 feet by 18 feet. The walls are of blue flag-stone with yellow sandstone dressings, and slated roofs. The roof, which is open, is 22 feet to collar. There are inlet fresh-air flues in buttresses, and vitiated air extractors on roof. The chapel gives accommodation for 200 persons, and the school for 70, at a cost of 850*l*. Mr. J. Sadler, of Starbeck, is the builder, and Mr. T. Butler Wilson, of Leeds and Harrogate, is the architect.

**London.**—The erection of the tower and spire of the church of the Holy Trinity, West Hill, Wandsworth, which has been in progress during the past twelve months, has been finally completed. The total height of the tower and spire together is 150 feet, the tower being 78 feet and the spire 72 feet, with handsome finial cross and vane rising another 10 feet. The lower storey of the tower is planned to form a lofty porch, groined and vaulted in Bath stone, and closed with handsome wrought-iron gates. On examination of the site and existing walls of the church, the architect deemed it advisable to build the tower independent of the church. It rests on a bed of cement concrete about 30 feet square and 6 feet thick. The south and east walls forming the inner walls of the church showed evidence of instability for the great weight to be placed upon them, and were taken down and rebuilt from the foundations, and the tower is, constructively, unconnected with the church. The walls at the ground level for 25 feet are 3 feet 6 inches thick and built in cement, and 3 feet thick above that height to the top. They are built of brick internally, faced with Kentish rag stone to correspond with the church, and Corsham Down Bath stone for the dressings. The spire is altogether of Bath stone, 18 inches thick at the springing and 9 inches above, the uppermost 10 feet being solid. Upon the top of the tower walls a course of York stone is laid as a bed course for the spire, and two wrought-iron chains run round the walls at the springing of the spire, which is additionally secured by two iron rods crossing each other diagonally. The contract was accepted by Mr. George Dobson, of Colchester, for 3,680*l*, the lowest of twelve tenders from known builders in London and the country. The work has been admirably executed, under the personal supervision of the architect, Mr. George Patrick, A.R.I.B.A., of Drummond Chambers, Adelphi, and

High Street, Wandsworth, the clerk of works being Mr. T. Shelmerdine. New vestries are to be commenced at a cost of over 500*l*. The wrought-iron gates to the tower were executed from the architect's designs by Messrs. Cottam & Willmore, and the vane, &c., by Messrs. Hart, Son & Co. The lightning-conductor was supplied by Messrs. Newall & Co.

**Oxford.**—The work of restoring the perished stonework of All Saints Church has been put in hand, under the supervision of Mr. Wilkinson Moore. At present it is proposed to restore the upper stages of the tower as far as the funds at the disposal of the vestry will admit. The upper portion of the spire was rebuilt as recently as 1873, but from the base of it downwards all portions of the facework show signs of being badly perished. Messrs. Symm & Co. are the contractors.

**South Shields.**—The Presbyterian Church in Mile End Road, South Shields, has been built thirty years, but during that time no minister has been properly heard in it on account of its acoustic defects. In the spring of this year the managers consulted Mr. John Wills, F.S.Sc., of Derby, well known for his experience in such matters, and, under his supervision, certain alterations have been made at a moderate cost, which have entirely altered the character of the building. It is pronounced to be a great success, and while the acoustic defect is cured the appearance is also very much improved.

#### GENERAL.

**H.R.H. Prince Albert Victor** has consented to act as President of the Great Northern Central Hospital, the new buildings of which were lately opened by their Royal Highnesses the Prince and Princess of Wales. Sir Andrew Clark, Bart., M.D., F.R.S., and Mr. Wm. S. Savory, F.R.S., have also joined the medical staff as consulting physician and consulting surgeon respectively.

**Mr. G. G. Hoskins, F.R.I.B.A.**, of Darlington, is the successful competitor for the Lynnfield schools, to be built by the West Hartlepool School Board, to accommodate 1,000 children.

**Plans** for proposed additions to All Saints Episcopal Church, Edinburgh, prepared by Dr. Rowand Anderson, have been approved by the Dean of Guild Court.

**Plans** by Messrs. Thornton, Shiells & Thomson, of Edinburgh, have been selected in competition for the proposed fever hospital, Duddingston.

**The Royal Commission** on the Metropolitan Board of Works on Tuesday adjourned *sine die*. The report will be made in a couple of months.

**A Party** consisting of members of the committee of the Leeds magistrates, and of the Corporation gas committee, has paid a visit to the works of the Leeds Forge Company. Mr. Sampson Fox showed them round the works, and explained to them in detail the plant employed and the mode of converting water into gas, which is used throughout the works for the purposes of heating and illumination.

**An Examination** of candidates for the offices of Municipal Engineer and Local Board Surveyor will be held at the Institution of Civil Engineers, Great George Street, Westminster, on Friday and Saturday, October 26 and 27 next. Applications for the examination must be sent to the secretary, Mr. Thomas Cole, not later than September 5.

**Plans** for the new Caledonian Railway passenger station in South Union Street, Dundee, were submitted to a meeting of the Police Commission on Monday. They showed a handsome building in the Scotch baronial style of architecture.

**A Swimming Bath**, 75 feet long and 35 feet wide, and said to be the largest brine-bath in England, was opened on Tuesday at St. Andrew's Brine Baths, Droitchich. The building was designed by Mr. Louis Sheppard, of Worcester.

**A Range of Buildings** in Kirkwall, comprising the North of Scotland and the Orkney and Shetland Steam Navigation Company's Offices, Tower's Hotel, and the old Orcadia Company's old chambers, has been acquired by a gentleman in Kirkwall, who is to erect a large hotel on a portion of the property.

**The Great Eastern Railway** have issued a tourist guide for the Continent. Though only sixpence in price, it has nearly 150 pages of matter and map. It is copiously illustrated throughout, and, apart from the exhaustive information as to means of travel, fares, accommodation, &c., it is worth getting by those who do not intend to travel, by reason of the interesting information and descriptions. It will prove of much value to tourists, without being an encumbrance either in the portmanteau or the hand.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, AUGUST 17, 1888.

## THE ARCHITECT AND CONTRACT REPORTER.

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For Two Lines and under (eight words to the line)	£0	2	6
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*Special arrangement may be made for a series of insertions on application to the Publisher, P. A. GILBERT WOOD 175 Strand, London, W.C.*

### TENDERS ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

### EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

### COMPETITION OPEN.

GORTON.—Sept. 15.—Designs are Invited for Public Baths. Mr. R. T. Holland, Clerk to the Local Board, Local Board Offices, Gorton.

### CONTRACTS OPEN.

ASHTON-UNDER-LYNE.—For Building Seven Houses and One Good House. Messrs. T. D. & J. Lindley, Architects, Ashton-under-Lyne.

BATLEY.—Aug. 17.—For Building Houses. Mr. Thomas Howdill, Architect, 13 Oxford Row, Leeds.

BELFAST.—Aug. 20.—For Building Sunday School. Mr. James J. Phillips, Architect, 21 Arthur Street, Belfast.

BELFAST.—Aug. 24.—For Building Warehouse and Offices. Mr. J. J. Phillips, Architect, 21 Arthur Street, Belfast.

BLACKPOOL.—Sept. 5.—For Building Theatre and Five Shops. Mr. W. Longley, Architect, 5 Charles Street, Bradford.

BRADFORD.—Aug. 20.—For Altering Salem Chapel for School Board Office. Mr. C. H. Hargreaves, Architect, Craven Bank Chambers, Bradford.

BRADFORD.—Aug. 23.—For Alterations to Warehouse. Mr. Samuel Robinson, Architect, Exchange Buildings, Bradford.

BRADFORD.—Aug. 23.—For Building Two Houses. Messrs. Brayshaw & Co., Architects, Bowling Old Lane, Bradford.

CLAPHAM.—Aug. 27.—For Building Public Library, Orlando Road. Mr. H. Bulcraig, Stanley House, 20 Lydon Road, Clapham.

DEWSBURY.—Aug. 17.—For Building Two Dwelling-houses. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

FOLKESTONE.—Aug. 17.—For Heating Buildings of the Pleasure Gardens. Mr. Seymour Clarke, General Manager, Folkestone.

HALIFAX.—Aug. 18.—For Building Shop and Offices. Mr. S. Wilkinson, Architect, Sowerby Bridge.

ISLE OF MAN.—Aug. 25.—For Constructing and Erecting Wrought-Iron Girder Bridge, with Two Opening Spans across Harbour at Ramsey. Mr. T. J. Lilley, Engineer, 4 Westminster Chambers, Victoria Street, Westminster.

LEEDS.—Aug. 30.—For Various Works Required in Alterations and Additions to Stanley House, Pontefract Lane. Quantities supplied. Messrs. Swale & Mitchell, Architects, 51 Albion Street, Leeds.

LONDON.—Aug. 20.—For Erection of Buildings at Ambulance Station, Old Kent Road. Mr. T. W. Aldwinckle, Architect, 2 East India Avenue, E.C.

LONDON.—Aug. 28.—For Construction of Foundations for proposed General Post Office North, St. Martin's-le-Grand. Drawings, &c., at H.M. Office of Works, 12 Whitehall Place, S.W. Mr. W. H. Primrose, Secretary.

MARYLEBONE.—Aug. 20.—For Building Wards at the Workhouse. Messrs. H. Saxon Snell & Son, Architects, 22 Southampton Buildings, Chancery Lane, W.C.

MIRFIELD.—Aug. 23.—For Building Bank Premises. Mr. Arthur A. Stott, Architect, Heckmondwike.

NEWCASTLE-ON-TYNE.—Sept. 5.—For Alterations at Central Station. Mr. C. A. Harrison, Engineer.

NEWCASTLE-ON-TYNE.—Sept. 5.—For Extension of Central Station Hotel. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

PADSTOW.—Aug. 28.—For Building Three Coastguard Houses, &c. The Director of Works Department, 21 Craven Street, Charing Cross.

SUTTON-IN-ASHFIELD.—Aug. 20.—For Building Town Hall. Mr. J. P. Adlington, Architect, High Pavement, Sutton-in-Ashfield.

TREDEGAR.—Aug. 21.—For Building Church. Messrs. James & Morgan, Architects, 57 Queen Street, Cardiff.

WHITEHAVEN.—Aug. 25.—For Building Dwelling-house. Mr. J. W. Mulcaster, 17 Lonsdale Place, Whitehaven.

WIDNES.—Aug. 21.—For Superintendent's House and other Buildings at County Police Station. Messrs. F. & G. Holmes, Architects, Westminster Chambers, Crosshall Street, Liverpool.

YORK.—Aug. 22.—For Building Workhouse Chapel. Messrs. Penty & Benson, Architects, Clifford Chambers, York.

WREXHAM.—Aug. 18.—For Erecting Parsonage House, with Offices and Boundary Walls. Mr. Edward Jones, M.S.A., Architect, 12 Temple Row, Wrexham.

\* Names and addresses to be forwarded not later than date.



## TENDERS.

## ACTON.

For Forming and Making-up New Roads at Acton, W., to be called Grafton Road, Baldwin Gardens, and continuation of Goldsmith Road. Mr. EDWARD MONSON, jun., A.R.I.B.A., Architect and Surveyor, Grosvenor House, The Vale, Acton, W.

## Grafton Road and Baldwin Gardens.

J. Ball, Chiswick	£3,395	0	0
G. S. Coat, Hammersmith	3,216	0	0
Rowland Bros., Fenny Stratford	3,154	0	0
Nowell & Robson, Kensington	3,045	0	0
G. Osenton, Westerham	2,992	0	0
Neave & Son, Paddington	2,777	0	0
J. Pizzey, Hornsey	2,744	0	0
T. HALL, Rugby (accepted)	2,643	0	0
G. Aldred, Kew Bridge	2,605	0	0

## Goldsmith Road.

J. Ball, Chiswick	1,117	0	0
Rowland Bros., Fenny Stratford	1,050	3	8
G. S. Coat, Hammersmith	1,041	0	0
G. Osenton, Westerham	977	0	0
Nowell & Robson, Kensington	952	0	0
G. Aldred, Kew Bridge	906	0	0
J. Pizzey, Hornsey	888	0	0
Neave & Son, Paddington	865	0	0
T. HALL, Rugby (accepted)	834	0	0

## AYR.

For Construction of Cattle Market, Ayr.			
Highest tender	£4,576	0	0
J. & D. MEIKLE (lowest, and accepted)	4,240	7	10

There were seven tenders.

## BARNET.

For Building Four Semi-detached Houses, New Barnet. Mr. JOSEPH WHITE, Architect, New Barnet.			
T. Pearce, New Southgate	£1,810	0	0
E. Doverhouse, Woodford	1,719	0	0
Dover, Wood & Co.	1,619	0	0
Bishop Bros. & Marston, Islington	1,513	0	0
W. Pavey, Winchmore Hill	1,416	0	0
HARRISON & CRABB, Enfield (accepted)	1,393	0	0
Groome, Islington	1,335	0	0

## BERKHAMSTED.

For Alterations and Additions to King Edward VI. Grammar School, Berkhamsted. Messrs. BATTERBURY & HUXLEY, Architects.

H. Fincher	£5,610	0	0
Patman & Fotheringham	5,339	0	0
J. & J. Greenwood	5,205	0	0
Holliday & Greenwood	5,147	0	0
B. E. Nightingale	5,030	0	0
S. Grist	4,666	0	0

## BUCKLAND THURLESTONE.

For Erection of Farm House and Farm Buildings, Buckland Thurlestone, near Kingsbridge. Mr. W. M. TOLLITT, Architect.

Edgecombe & Harvey, Blacktawton	£1,691	0	0
G. Hooper, Kingsbridge	1,675	0	0
T. Kennedy, Plymouth	1,645	0	0
Steer Bros., Aveton Gifford	1,600	0	0
J. Luckraft, Aveton Gifford	1,590	0	0
H. Brown, Harbertonford	1,588	16	9
Tucker & Hutchings, South Allington	1,508	0	0
N. Rundle, Kingsbridge	1,499	0	0
Farr & Sons, Kingsbridge	1,485	0	0
J. R. Ruth, Kingsbridge	1,421	10	0
Chapman & Pearce, Kingsbridge	1,395	6	0

## CARMARTHEN.

For Erection of Rectory at Merthyr, for the Rev. J. D. Jones, Rector. Mr. D. JENKINS, A.R.I.B.A., M.S.A., Architect, Llandeibie, South Wales.

T. Davies, Llanstephan	£1,350	0	0
J. Williams, Knighton	1,247	0	0
Rees & Evans, Meidrym	1,180	0	0
Thomas & Son, Merthyr	1,155	0	0
B. Howell & Son, Llanelly	1,127	18	5
J. Lloyd, Carmarthen	1,060	0	0
W. Evans, Carmarthen	939	0	0
Architect's estimate	956	0	0

No Tender accepted.

## CHATHAM.

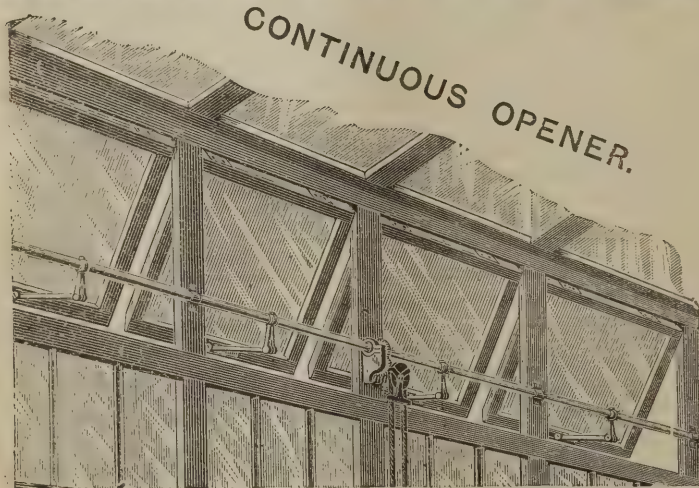
For Heating by Patent Warm Air Apparatus the Workhouse Chapel and Unitarian Chapel, Chatham. Mr. DRAKE, Architect, Rochester.

JOHN GRUNDY, London and Tyldesley (accepted).

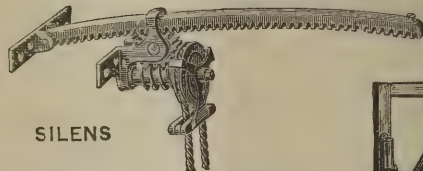
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I remain, yours obediently,

R. DAVIES, Architect.

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TELEGRAPHIC ADDRESS—"SILENS BRADFORD."



## CLEETHORPES.

For Road Improvement Works, Cleethorpes.	Mr. W. H. RADFORD, Engineer, Nottingham.		
G. Webster, Sheffield	£3,915	8	0
A. Ward, Sheffield	3,900	0	0
S. Ross, Bramley	3,812	10	7
Sterling & Swan, Manchester	3,650	0	0
T. Smart, Nottingham	3,397	0	0
F. Enderby & Co., Grimsby	3,388	0	0
W. Cordon, Burton Joyce	3,320	0	0
J. Copley, Lincoln	3,185	8	3
A. F. James, Cleethorpes	3,048	0	0
Holme & King, London	3,029	4	0
K. & J. Holmes, Clay Cross	3,000	0	0
D. Barry, Radcliffe-on-Trent	2,989	16	0
Simpson & Malone, Hull	2,984	3	6
J. Tomlinson, Derby	2,832	0	0
R. Clarke & Son, Sheffield	2,824	17	6
J. & R. Horton, Lincoln	2,824	0	0
J. Vickers, Nottingham	2,807	0	0
C. Green, Rotherham	2,724	10	0
J. BROWN, Grimsby (accepted).	2,600	0	0

## COLCHESTER.

For Building Corn Exchange, Haverhill.			
Everett & Son	£1,473	0	0
Orfeur	1,398	0	0
Grimwood & Son	1,395	0	0
Mason & Son	1,329	0	0
Dupont	1,275	0	0
DISS (accepted).	1,250	0	0

## CRAVEN ARMS.

For Building Corn Exchange, Assembly Rooms, &c., Craven Arms, Salop.	Mr. T. EVANS, Architect, Brampton Brian.		
D. C. Jones & Co., Gloucester	£1,644	0	0
Price, Shrewsbury	1,495	0	0
C. T. Smith, Broseley	1,494	0	0
Davies, Shrewsbury	1,480	0	0
Neale, Ludlow	1,394	0	0
Millward, Leominster	1,388	0	0
Barker, Craven Arms	1,219	0	0
J. WILLIAMS, Knighton (accepted).	1,030	0	0

## CHELMSFORD.

For Construction of Waterworks, for the Chelmsford Local Board. Mr. C. PERTWEE, Architect, Chelmsford.

## Reservoir.

T. Bell, Market Wrighton	£1,133	2	10
Botterill, London	934	0	0
Neave & Son, Leytonstone	850	0	0
Holme & King, London	756	9	0
A. J. Gould, Southampton	709	0	0
LANGLEY & Co., Crawley (accepted)	677	0	0
G. Ball, Tottenham	666	0	0
H. T. Potter, Chelmsford	541	13	0

## Tower, &amp;c.

T. Bell, Market Wrighton	4,564	18	0
Neave & Son, Leytonstone	3,969	0	0
Botterill, London	3,469	0	0
Holme & King, London	3,260	12	0
G. Ball, Tottenham	2,998	0	0
A. J. Gould, Southampton	2,707	13	0
LANGLEY & Co., Crawley (accepted)	2,526	0	0

## Tanks, &amp;c.

Warner & Sons, London	2,535	0	0
A. G. Mumford, Colchester	2,439	0	0
Neave & Son, Leytonstone	2,216	0	0
J. & S. Roberts, West Bromwich	2,195	0	0
G. Ball, Tottenham	2,189	0	0
A. J. Gould, Southampton	2,154	4	0
Botterill, London	2,094	0	0
J. O. Brettell, Worcester	1,925	17	0
LANGLEY & Co., Crawley (accepted)	1,888	0	0

## Mains, &amp;c.

Holme & King, London	2,163	19	0
Neave & Son, Leytonstone	1,959	0	0
Botterill, London	1,897	0	0
A. J. Gould, Southampton	1,885	11	0
Warner & Sons, London	1,865	0	0
Langley & Co., Crawley	1,844	0	0
G. Ball, Tottenham	1,821	0	0
J. & S. ROBERTS, West Bromwich (accepted)	1,777	13	6

## DURHAM.

For Heating Crathorne New Church and Easingwold New Church. Mr. C. HODGSON FOWLER, M.A., Architect, Durham.

JOHN GRUNDY (accepted).

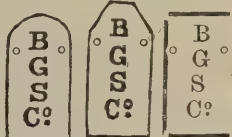
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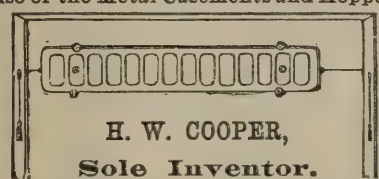
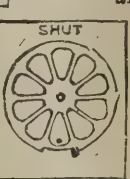
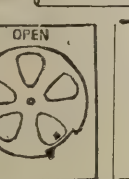
Improved Glass Louvre and Venetian Ventilators, for Private and Public Buildings, Churches, Halls, and lights of every description. Improved Iron, Copper, Brass, and Gun-Metal Casements. New Hopper Ventilators for Skylights, &c. Medal awarded to H. W. Cooper from Glass Sellers' Company Exhibition, London, 1876. Diploma of Merit, Sanitary Institute of Great Britain Exhibition, Glasgow, 1883. Diploma of Merit, National Health Society Exhibition, London, 1883.



MEDAL AWARDED, 1876.

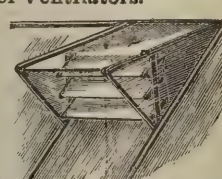


Improved Casement. Circular Glass Revolving Ventilator.

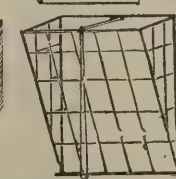


H. W. COOPER, Sole Inventor.

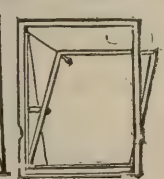
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J. Crook & Sons, Northam	£3,327	0	0
W. Church, Bristol	2,249	0	0
H. A. Forse, Bristol	2,060	0	0
R. B. Mullings, Devizes	2,050	0	0
W. Cowlin & Sons, Bristol	1,947	0	0
W. E. Chivers, Devizes	1,929	0	0
G. Moore, Trowbridge	1,895	7	0
G. BROWN, Devizes (accepted)	1,869	0	0

## HALSTEAD.

For Heating Grinstead Green Church, Halstead, Essex, for Rev. E. C. Corrie, M.A.

JOHN GRUNDY (accepted).

## HARROGATE.

For Erection of Wesleyan Chapel and School at Starbeck, Harrogate. Mr. T. BUTLER WILSON, Architect, Leeds and Harrogate.

## Accepted Tenders.

J. Sadler, Starbeck, mason	£364	0	0
R. Dent, York, joiner	219	0	0
G. Lazenby, plumber	49	0	0
Dougall, Leeds, hot-water	41	18	6
J. Paddon, plasterer	39	10	0
Shepherd, Harrogate, slater	38	15	0
A. Knowles & Son, Leeds, painter	18	0	0

## HARTON.

For Heating Harton Colliery Church. Mr. C. HODGSON FOWLER, M.A., Architect, Durham.

JOHN GRUNDY (accepted).

## ILFRACOMBE.

For Construction of Impounding Reservoir near Ilfracombe. Mr. E. APPLETON, C.E., Engineer, 1 Vaughan Parade, Torquay.

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				Months.
G. Shellbeer, Mutley, Plymouth	15,210	0	0	20
Pickthall & Sons, Merthyr Tydvil	14,261	19	2	8
Matcham & Co., Plymouth	10,389	0	0	—
J. Aird & Sons, Lambeth	9,426	0	0	8
Hill & Co., Plymouth	8,798	0	0	8
R. Lean, Newport, Mon.	8,400	0	0	6
R. Lean, Newport, Mon.	8,000	0	0	10

## LEAMINGTON.

For Laying 1,320 yards of 3-inch Water Mains from Leamington to Heathcote, for the Warwick Joint Hospital Board. Mr. W. DE NORMANVILLE, Borough Surveyor.

Heatherley Bros., Coventry	£225	0	0
J. & F. Bennett, Northampton	224	10	0
T. Houghton, Leamington	176	0	0
J. Warwick, Leamington	165	10	0
W. Jenkins & Son, Leamington	157	0	0
E. Warwick, Leamington	151	10	0
C. DUKE, Leamington (accepted)	149	15	0

## LLANDEBIE.

For Addition and Repairs to Derwydd Mansion, for Mr. Alan S. Stepney-Gulston. Mr. D. JENKINS, A.R.I.B.A., M.S.A., Architect, Llandebie, S.W. Quantities not supplied.

B. Jenkins, Brecon	£2,975	0	0
W. Evans, Carmarthen	2,878	0	0
W. BOWERS & CO., Hereford (accepted)	2,705	15	0

## LLANDILO.

For Addition and Alteration to Tregib Mansion, for Mr. J. W. Gwynne Hughes, J.P., High Sheriff and Deputy-Lieutenant for the County of Carmarthen. Mr. D. JENKINS, A.R.I.B.A., M.S.A., Architect, Llandebie, South Wales. Quantities supplied.

Thomas & John Brown, Llanelly	£4,157	2	4
John Williams, Knighton	4,048	9	3
Bowers & Co., Hereford	3,838	4	8
E. Mercer, Llanelly	3,799	10	0
B. HOWELL & SON, Llanelly (accepted)	3,647	0	0

For Repairs to Bank Buildings, for Mr. W. Thomas. Mr. D. JENKINS, A.R.I.B.A., M.S.A., Architect, Llandebie, S.W.

Thomas, Llandilo	£105	0	0
EVANS, Llandilo (accepted)	80	0	0

## LLANGADOCK.

For Restoration of St. Cadog Parish Church. Mr. D. JENKINS, A.R.I.B.A., M.S.A., Architect, Llandebie, South Wales. Quantities supplied.

W. Evans, Carmarthen	£2,700	0	0
D. Thomas, Llangadock	2,440	0	0
Evans Bros., Llanddewi-Brefi	2,224	8	6
J. Williams, Knighton	1,872	0	0
E. Mercer, Llanelly	1,858	0	0
H. Davies, Pontardawe	1,750	0	0
B. JENKINS, Brecon (accepted)	1,540	0	0

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B. Jenkins, Brecon . . . . . £250 0 0

## LLANON.

For Erection of House and Shop for Mr. W. H. Young,  
Grocer, Crosslands. Mr. D. JENKINS, A.R.I.B.A., M.S.A.,  
Architect, Llandeibie, South Wales.  
T. Davies, Llanstephan . . . . . £510 0 0  
R. Peregrine, Llanon . . . . . 420 0 0  
D. JONES, Gorslas (accepted) . . . . . 335 0 0

For Erection of Schoolroom for the Rev. W. Jones, Vicar of  
Llanon. Mr. D. JENKINS, A.R.I.B.A., M.S.A., Architect,  
Llandeibie, South Wales:

D. Peregrine, Felinfoel . . . . . £220 0 0  
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R. PEREGRINE, Llanon (accepted) . . . . . 178 0 0

For Erection of Congregational Schoolroom at the Tumble,  
Llanon. Mr. D. JENKINS, A.R.I.B.A., M.S.A., Architect,  
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For Heating New Surrey Chapel, Blackfriars Road. Mr. JAMES  
WEIR, Architect, London.

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For Heating New Baptist Chapel, Crouch Hill. Mr. WALLIS  
CHAPMAN, Architect, Sutherland Gardens.

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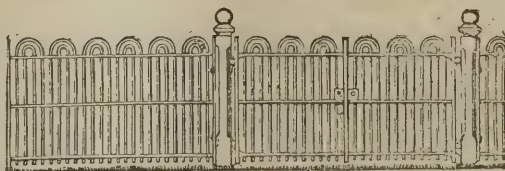
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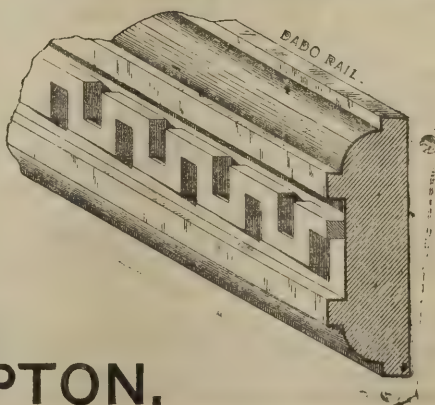


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Grey & Craib, Aberdeen	£395	0	0
Scott & Norrie, Aberdeen	298	0	0
W. Davidson, New Pittligo	297	0	0
J. Stephen, Ellon	288	0	0
A. Scroggie, Aberdeen	263	0	0
E. Gauld, Aberdeen	256	0	0
A. Forbes, Ellon	235	0	0

## Carpenter Work.

G. Jamieson, Woodside	36	0	0
G. Ross, Newburgh	30	10	0

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J. Campbell, Aberdeen	19	5	0
J. F. Anderson, Aberdeen	16	10	0
A. Robertson, sen., & Son, Aberdeen	14	10	0
W. Gall, Newburgh	14	0	0

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J. Moir, Newburgh	10	0	0
W. Gall, Newburgh	4	16	0

## SEACOMBE.

For Heating New Catholic Church, Seacombe. Mr. KIRBY, Architect, Liverpool.

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## SEATON.

For Heating by Patent Warm Air Apparatus, New House, Seaton. Mr. GARRY, Architect, West Hartlepool.

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## STOCKPORT.

For Wrought-iron Fencing to the Edgely Park. Mr. A. M. FOWLER, C.E., St. Peter's Gate, Stockport.

## Revised Tenders.

J. O. Brettell, Worcester	£270	9	9
Hill & Smith, Staffordshire	260	7	0
John James Renshaw, Manchester	249	0	0
R. T. Smith & Co., Whitchurch	225	0	0
H. Hollingdrake & Son, Stockport	225	0	0
James Cunliffe & Co., Pendleton	204	12	0
Johnson Brothers & Co., Walsall	158	10	0
ARTHUR GRAY, Stockport (accepted)	145	8	0

## SUNDERLAND.

For Heating New Church, Hendon, Sunderland. Mr. C. HODGSON FOWLER, Architect, Durham.

JOHN GRUNDY (accepted).

## WILTON.

For Building Clock Turret, Town Hall, Wilton. Mr. G. J. CARSE, Architect, Wilton.

J. W. Hopkins, Wilton.

Thomas Dawkins, Barford St. Martin.

These tenders considered too high, and fresh tenders are to be invited.

## WREXHAM.

For Building Farm Cottage, &c., Glanrafon, near Wrexham. Mr. EDWARD JONES, M.S.A., Architect, Wrexham.

Jenkins & Jones, Johnstown	£270	11	0
Samuel Chaloner, Rossett	223	8	0
Davies & Son, Rhosyleen	219	0	0
R. D. DAVIES, Buckley (accepted)	200	0	0

## TRADE NOTES.

ALTERATIONS have been made at the Infirmary, Halifax, including the ventilation, Messrs. Robert Boyle & Son's latest improved patent self-acting air-pump ventilator being used for the extraction of the vitiated air.

MR. E. H. SHORLAND, of Manchester and London, has recently supplied his patent Manchester grates to Glanadda Schools, Bangor, Mr. R. Davies, of Bangor, being the architect.

THE firm of Morewood & Co., Limited, of the Lion Galvanising Works, Birmingham Heath, Birmingham, is, we understand, in the process of reconstruction, and will be carried on under the title of Morewood & Co.'s Successors, Limited. With an influential board of directors and better management, the firm should be able to take the position which they held some years ago for good materials, workmanship, &c.

ON Monday the Arbroath Town Council sanctioned reports by Mr. Mitchell, engineer to the Edinburgh Gas Company, and a sub-committee of the Board, recommending an extension of the works at Arbroath by the erection of an additional gas-holder, the laying down of a new main to the low-lying district of the town, the giving of additional purifying area, and the adoption of regenerative furnaces. The estimated cost of the works is about 8,000l.

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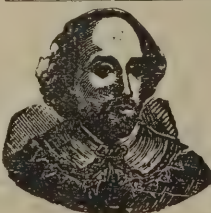
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ON Monday some of the joiners in Dundee, to the number of fifty-three, struck work for an advance of wages. Ten days ago, at a mass meeting, the joiners resolved to ask their employers to give them a rise of  $\frac{1}{4}d.$ , bringing up the standard rate of wages to  $7d.$  per hour. A week was given them to consider the matter, and the result was that the majority of the masters conceded the demand, while others refused to grant any increase. Several other masters afterwards intimated their intention to pay their men  $7d.$  per hour, while others offered  $6\frac{3}{4}d.$ , which was refused.

### WORKMEN'S DWELLINGS IN IRELAND.

THE report of the directors of the Dublin Artisans' Dwellings Company, Limited, for the past half year states that the cottages on the Bray site are in a forward state, and it is hoped that some of them will be occupied during this month. When the cottages at Bray are completed, the number of tenements erected will be 1,400, capable of accommodating 7,000 persons. The rental of property for the half-year ending June 30, 1888, was  $8,310l. 12s. 4d.$  as compared with  $8,243l. 4s. 8d.$  for the previous half-year, showing an increase of  $67l. 7s. 8d.$  The entire revenue for the half-year amounts to  $8,415l. 19s.$ , which, after providing for all expenses, will leave a balance of  $3,585l. 13s. 3d.$ , out of which is recommended a dividend at the rate of  $4\frac{1}{2}$  per cent. per annum, free of income-tax, absorbing  $2,222l. 15s. 7d.$ , and leaving a balance of  $1,362l. 17s. 8d.$  to be carried to depreciation fund, which will then amount to  $9,218l. 8s. 4d.$  The capital of the company is now expended in the purchase of the lands and the erection of the buildings from which the present satisfactory revenue is derived. The directors are of opinion that an extension of the operations of the company is most desirable, as there is still a pressing want of suitable house accommodation for the working-classes, more particularly the lower paid section of those classes. The company, which was formed in 1876, with a capital of  $50,000l.$ , paid its first dividend (3 per cent.) for the half-year ending June 1878, when 99 tenements were occupied. Its capital has since been increased to  $100,000l.$ , and  $83,167l.$  has been borrowed from the Board of Works. The dividend has been gradually increased to  $4\frac{1}{2}$  per cent., and the number of tenements stands at 1,400, covering 28 acres of ground. The directors have discharged out of the revenue account the entire of the preliminary

expenses ( $653l. 1s. 4d.$ ), also a sum of  $794l. 1s. 11d.$  for "offices and furniture," and have formed a depreciation fund which now amounts to  $9,218l. 8s. 4d.$  During the company's existence  $76,664l. 12s. 7d.$  has been collected in rents; for the same period the arrears amount to  $149l. 0s. 7d.$ , and the bad debts to  $182l. 9s. 3d.$

### MACCLESFIELD SEWERAGE.

THE Local Board of this town lately advertised an open competition to civil engineers for the best scheme for the interception of the sewage now flowing into the River Bollin, and its purification by the best known method. Mr. W. H. Radford, Assoc. M. Inst. C.E., of Nottingham, is the successful competitor. His scheme is to lay 6 miles of intercepting and outfall sewers to collect the sewage now flowing into the river, and convey it to an outfall below Prestbury. He then proposes to purify the sewage by irrigation on 159 acres of suitable land, specially laid out and drained for the purpose. The manufacturing refuse, consisting chiefly of soapsuds and dye-water, is also proposed to be dealt with. The population is 39,000, and the estimated cost of works only, without land or easements, is  $23,750l.$  Mr. Radford was also lately the successful competitor for the sewage schemes of Newhaven and Beaconthorpe.

### CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.

ON Saturday Mr. A. T. Walmisley, C.E., awarded the certificates gained by the students of the Crystal Palace Company's School of Practical Engineering, the distribution taking place in the south tower of the Palace. Mr. F. K. J. Shenton read the report, which stated that out of 32 students who had attended the lecture examination on "Railways: their Construction and Appliances," 22 proved eligible for examination, and 18 satisfactorily passed. The result of the examinations in the various sections was of a most satisfactory nature. Mr. Walmisley, in addressing the students, said that the report showed that good work was being done in the school. He could speak with a practical knowledge, having examined in the civil engineering section two years ago. Civil engineering was world-wide in its work, and could claim to have done a good deal towards the civilisation of the globe. Mr. J. W. Wilson,

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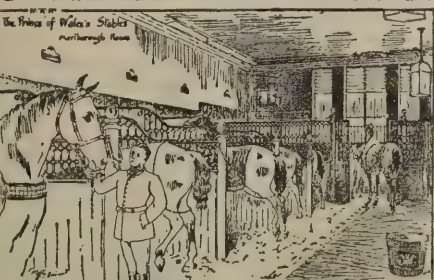
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the principal, said the school had been established 16 years, and that was the 47th occasion upon which certificates had been awarded. Between 700 and 800 students had passed through the school, many of whom were doing well. He mentioned that seven or eight of their old pupils were now engaged as engineers in the construction of the Manchester Ship Canal.

#### EMPLOYERS' LIABILITY ACT.

A PARLIAMENTARY paper has been issued containing a return of the total number of cases tried in the County Courts in England, Scotland, and Ireland in 1886 and 1887. The total number of cases thus tried in England in 1886 was 161, and in 1887 170. The amount of compensation claimed in 1886 was 25,559*l.*, and the amount awarded 4,791*l.* In 1887 the amount claimed was 31,196*l.*, and the amount awarded was 6,669*l.* In Scotland the amount of compensation claimed in the period covered by the return was 59,888*l.*, and the amount awarded was 1,999*l.* In Ireland the number of cases tried was 28; the amount of compensation claimed was 3,430*l.*, and the amount awarded was 444*l.*

#### PAYMENT OF SUB-CONTRACTORS.

ON Friday, at the Liverpool Assizes, a case brought by Joseph Simpson (trading as Simpson & Co.), Darlaston, against Messrs. Neill & Sons, of Manchester, to recover 7,000*l.* for work and labour done as sub-contractor for the defendants at the new Liverpool Exchange Station of the Lancashire and Yorkshire Railway Company, was heard. The contractors at the new Exchange Station were Messrs. Neill & Sons, and Simpson sub-contracted for the ironwork. There were a number of matters in dispute, but the only question argued before his lordship was whether a certificate from the engineer of the railway company as to the work having been done was a condition precedent to the sub-contractor recovering the amount claimed, and whether a document put in was such a certificate. By the agreement the sub-contractor was to be paid when the engineer had certified. The company's engineer had certified to the contractors that the amount due by them to the sub-contractor was 2,100*l.*, and the plaintiff relied on this as a sufficient certificate so far as he was concerned, but not conclusive as to the amount he was entitled to. Messrs.

Neill asserted that he must produce a certificate, and also that the engineer having certified as to the amount due to him, his decision was final. In the agreements it was stated that all disputes were to be referred to the arbitrators, Sir John Hawkshaw and Mr. Sturgess Meek, and Simpson asked his lordship to decide that the document produced was a sufficient certificate to enable him to go to the arbitrators to have settled the final amount to be paid to him. The contractors paid into court the amount certified by the engineer as due.—His lordship said it was a strange thing that in cases of large contracts it invariably happened that some loophole was left in the documents for a legal question to be raised. His judgment would be for the sub-contractor upon a question whether or not a certificate had been given, and whether or not the parties had a right to ask the company to refer the matter to the arbitrators to see what further amount was owing. Judgment for 2,100*l.*, with costs, was then given, and any further amount will be settled by the arbitrators.

#### SANITATION OF TOWNS.

At the meeting of the British Medical Association, in Glasgow, a discussion took place on the subject of sewage disposal.

Dr. J. B. Russell opened the discussion by alluding to the history of the present position of the question of sewage disposal as it affected Glasgow. He then proceeded to describe the drainage area of the Clyde, and the successive steps which had been adopted in dealing with the sewage. The first common sewers, he mentioned, were formed in 1790, and the first water supply was taken from the Clyde above the town in 1806, supplemented from the same source in 1808. Till this time there were few water-closets in the city. In 1831 five miles of sewers were laid down in forty-five streets, extended to sixty miles in 1860. As sewers extended complaints of the state of the Clyde and its tributaries increased. The visitations of cholera in 1832, 1848, and 1853, showed that even two and a half miles above Glasgow Bridge the Clyde water had ceased to be fit for dietetic use. The Gorbals water, introduced in 1846, shielded that portion of the city from cholera in 1853. Loch Katrine water was introduced in 1859, and they had had no epidemic of cholera since. By 1849 the pollution of the Clyde had attracted public attention. It was remarkable

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that the references to its condition in the *Glasgow Herald* of that date were couched in language quite as emphatic and as strong as any applied to the Clyde at the present time. The tributaries which distressed our forefathers had gradually been dealt with by making them sewers or by intercepting the sewage and conveying it direct to the Clyde. There were few cities in which more had been done to remove filth from the environment of the dwelling, but nothing of the sanitary operations of late years except the improvement of the streets and of the system of scavenging had advantaged the Clyde. The question remained, How was it that the offensiveness of the river had not increased? The probable answer was that the operations of the Clyde Trust had tended to dilute the sewage with a steadily increasing amount of impounded tidal water, and had also facilitated its removal seawards. The effect of these operations in expediting the removal of the sewage had been shown by experiments with floats. In 1858 a float took 43½ tides or 537 hours to reach Port-Glasgow, 19½ miles. For 1879 it took only 10 tides or 120 hours 40 minutes to reach Gourrock, a distance of 24 miles. The removal of the weir in 1881 somewhat reduced the rate of movement. Another fact which helped to explain why there had been no strong expression of public opinion in recent years was that by the extension of railway communication passenger traffic had been largely withdrawn from the upper Clyde. But the sewage question was not to be solved in this way. They would recognise the natural sequence of events when he stated that it had been transferred as a burning question to the lower reaches of the river. It began in the Molendinar. It was pushed into the Clyde, and now it had been partially removed to the Tail of the Bank and Loch Long. The 154 acres over which the Glasgow harbour and docks extended formed a settling pond from which last year 610,000 cubic yards of more or less foul deposit was dredged and transferred to Loch Long, at a cost to the trustees of about 6d. per cubic yard, exclusive of interest on plant. He stated that in 1858 Mr. Bateman condemned the system of precipitation, and recommended the construction of works similar to those then projected for London. The Town Council resolved to wait till London had showed the way. Messrs. Bateman & Bazalgette's scheme for conveying the sewage to the Ayrshire coast was next described, and also the proposal of the Royal Commission of 1876, presided over by Sir John Hawkshaw, that sewers should be constructed discharging at Farland Head, opposite the Little Cumbrae. The estimated cost of the

latter scheme was 2,500,000l. An endeavour to form a Board of Sanitary Commissioners of the Clyde by private Bill was unsuccessful, and Government had hitherto failed to implement a promise of general legislation for the purpose. In 1877 the Council came to the conclusion that the sewage, after being rendered clear by precipitation and filtration, should be passed into the Clyde, and Mr. Bateman suggested three schemes for this purpose. In 1881 the Sewage Committee adopted Mr. Bateman's scheme No. 3, by which the sewage of the north side was to be treated at Dalmuir, and of the south side at a point in the parish of Govan. Exclusive of cost of land and interference with property, this scheme was to involve an expenditure of 800,000l. on works alone. The annual charge for pumping was 3400l., and the cost of treatment and disposing of the sludge was roughly estimated at 40,000l. to 45,000l. a year. An idea prevailed that the removal of the weir would for a time make the sewage question less urgent. Partly under the influence of that idea and partly from the existence of so many administrative authorities, this scheme was not further considered. The removal of the weir had had no such effect as had been expected, though other circumstances had gradually tended in some degree to mitigate the nuisance at our own doors. There was some prospect of the extension of the municipality to include the whole populous area, and he had no doubt that one of the first questions which would engage the Consolidated Council would be the purification of the Clyde.

Dr. Alfred Carpenter, Croydon, read a paper on the same subject, advocating the utilisation of sewage on land by so-called "broad irrigation." In no single instance out of nearly one hundred cases in which sewage had been utilised by broad irrigation had any fact been proved to establish the allegations of "insanitary" which were sometimes raised against them.

Dr. C. R. Drysdale, London, contended that the only rational and satisfactory way of treating the sewage of cities and restoring the rivers to their original purity was by the method now used in Berlin, Paris, Croydon, Birmingham, Nottingham, and elsewhere—that is, agricultural utilisation on suitable areas and soils. The London Board of Works was a glaring instance of want of all plan in this question. For years past that Board, against the advice of Lord Bramwell's Commission, had gone on tormenting the dwellers on the banks of the Thames by pouring daily 150 millions of gallons of sewage in dry and 200 millions in wet weather into the river, and were now adding a greater absurdity, namely, the erection of two enormous tanks at Barking and Crossness, where a useless

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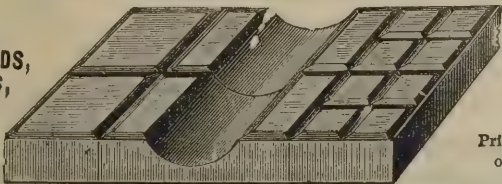
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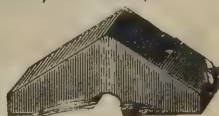
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experiment with chemicals was to be made. The tanks were to cost one million sterling, and the chemicals, &c., perhaps 100,000 a year.

Dr. T. J. Dyke, medical officer of health, Merthyr Tydvil, said that the local board of the town had adopted the process of Dr. Edward Frankland, known as the Downward Intermittent Filtration process, for disposing of their sewage. A site was chosen at Troedyrhiw, three miles below Merthyr, on the west bank of the Taff river; there, on a gravelly soil, Mr. Denton formed filtration areas on sections of land, by deep drainage, levelling of surface, and provision of an efficient outlet for the effluent water. Each area or section was flooded with strained sewage for six hours, and allowed to rest, to drain, and to be aerated for eighteen hours. The work was completed in the spring of 1881, and from thenceforth from one to three hundred thousand gallons of the strained liquid has daily been passed over and through the soil of the twenty acres of land so prepared. The work has been carried on without any injury to health. In 1872 and following years the surveyor to the board laid out 262 acres of land nine miles from Merthyr, and adapted the surface for this method of disposing of the sewage. The quantity disposed of on this land amounted to  $1\frac{1}{4}$  million gallons daily. The process is carried on without any detriment to health; and with regard to returns for labour and material, a fair profit has resulted. The total population of the several towns and villages connected with these sewage farms would be not less than 100,000.

Dr. Murray, medical officer of health, Forfar, described the system of irrigation adopted in that burgh. The quantity of land prepared to receive the sewage extended to about twenty-four acres on the estate of Orchard Bank. The outfall sewer is capable of delivering 2,000,000 gallons of sewage daily. The sewage is lifted 50 feet to the sewage farm by three 10 horse-power engines, capable of lifting 45,000 to 50,000 gallons per hour. The area of the land devoted to intermitted filtration is seven acres, leaving seventeen acres for surface irrigation. As to whether the scheme had been satisfactory from a sanitary point of view, he said the question could be answered without hesitation in the affirmative.

Dr. Wm. Whitelaw, medical officer of health, Kirkintilloch, said that the Kirkintilloch sewage works were drawing near completion, under the supervision of Mr. W. R. Copland, engineer. It had been found advisable, in order to minimise the cost of pumping, to construct two main outfall sewers, one for the higher parts of the burgh, and another for intercepting the

sewage of low-lying portions. Both reach from different points the filtration beds at Dryfield. The works of Dryfield consist of a storage tank, a distributing and screening tank, and the various channels and conduits connected therewith, and several filtration beds, covering at present an area of nine acres. After passing through the screening tank, the sewage will be directed by a number of sluices into the various distributing channels, and by them carried to the filtering beds. The subsoil drains lead to a main outfall, discharging into the Kelvin. The site of the farm at Kirkintilloch is twenty-four acres, and the population of the burgh is 8,000; but meantime only nine acres of the land have been laid out for cultivation. A large portion of the remaining fifteen acres can be used for purposes of irrigation, and ultimately, as the town increases, will be laid out in the same way as the nine acres.

The President (Dr. Littlejohn) described the manner in which the sewage of Edinburgh was disposed of. He explained that in the northern district, formerly drained into the Water of Leith, the sewage was now bottled up at the western boundary of the city, and conveyed in an iron pipe to the Firth of Forth at a point between Granton and Leith. The central district discharged its drainage on sandy soil on the celebrated Craighentenny meadows. In the southern district they had a population of 35,000 people located in villa residences with all modern improvements. This district drained into the Pow Burn, and it had been found necessary to lay down a pipe to convey the sewage of 40,000 people to the sea. The outfall of this pipe was a little to the west of Portobello, and a portion of the sewage was carried into the Craighentenny meadows. These meadows now extended to 186 acres, but they were insufficient.

Dr. J. Davis, Chicago, said he had listened to the papers which had been read with the greatest interest, for they gave information of which he had been in search for years. He described the system of drainage which had been adopted in Chicago, and stated that a scheme was before the State and the National Legislatures for turning the waters of Lake Michigan to the Ohio, and on through the Illinois river into Mississippi, so that the sewage of the city might be carried to the Gulf of Mexico. He strongly objected to this scheme of sending the sewage half the length of the continent and polluting rivers throughout their entire distance. There was sufficient prairie land within from ten to forty miles of the city on which sewage might be turned.

Colonel Jones described a sewage farm which he took in the year 1872, near Wrexham, 150 acres, and upon it treated

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the sewage of a population of 12,000 inhabitants. The scheme had been thoroughly successful, the authorities of Chester, who had been carefully watching the experiment, having found no ground for complaint.

Mr. W. R. W. Smith said that irrigation could only be applied in favourable circumstances. Given land suitable for irrigation, there could be no question that the best affluent was secured by that means. But there were many cases in which other methods must be adopted. The Local Government Board, having power to enforce the introduction of clean water into a city, burgh, or village, should have power to force the authorities to take away their dirty water; and if the Association was to come to any resolution it should be to ask the Government to give such powers. Public bodies would do nothing till they were forced. When compulsion was brought to bear on them the thing was done.

Mr. Bateman, Norwich, could not agree with Mr. Smith. The important question was as to how the thing was to be done. In proof of this, he mentioned that the town of Norwich had spent 200,000*l.* on a system of irrigation which had proved a failure. The mistake they made was that they carried their sewers at a low level under the river. They required to spend 3,000*l.* a year in pumping to their irrigation farm, which was on a high level, and they could not keep the water out of their sewers.

The discussion was then brought to a close.

#### OBSTRUCTION OF LIGHT.

AT the Chancery Court of the County Palatine of Lancaster, a case was decided on Tuesday in which the plaintiff, Mr. Martin, a property owner in Pembroke Place, Liverpool, sought for an injunction to restrain the committee of the Liverpool Royal Infirmary from obstructing his ancient lights on the southern and western side of his premises, 100, 102, 104 and 106 Pembroke Place, by the new infirmary buildings in course of erection. The lights of the premises in question, it was stated, had been seriously obstructed, the consequence being that the present tenant of No. 100, Mr. Slade, a cycle manufacturer, whose business required an abundance of good light, had given notice to quit. Mr. Maberly and Mr. Horridge appeared for Mr. Martin, and Mr. Rotch and Mr. Cochran for the Royal Infirmary. Mr. Martin stated in examination that there

was not the slightest foundation for the suggestion that he bought the property and altered it for business purposes with the view of making an undue or improper claim upon the defendants.

The Vice-Chancellor said he did not think any case for an injunction had been made out as regarded the southern window at the house in question, and he therefore dismissed that part of the action. With respect to the western lights he had been impressed by the evidence already given that the light had not been seriously and materially affected, and he suggested that the defendants should concede to build the eastern wall of their block in a sloping manner instead of perpendicularly.

Mr. Rotch argued that nine-tenths of the evidence of the plaintiff was totally irrelevant, because Mr. Slade, whose comfort was alleged to have been affected, was not a party to the action. Simply because Mr. Slade's comfort had been disturbed he could not succeed in the action; he could only succeed by showing material injury to his own reversion in the lease of the property, and there was no evidence that the selling or letting value of the property had been affected.

Mr. J. P. Bradley, architect, stated that the new buildings would not affect the letting or selling value of the plaintiff's premises. Mr. Edmund Kirby, chairman of the Liverpool Architectural Society, gave similar evidence. Mr. John Henderson, dentist, stated that in 1880 he occupied the house, and he then did very fine work in the room the light of which was alleged to be affected—much finer work than that done by Mr. Slade. He was of opinion that the new buildings would not diminish the light to such an extent as to prevent fine work being done there. Other witnesses were called as to the sufficiency of light, a watch manufacturer, Mr. J. C. Blundell, describing the light as ample for the purposes of his business.

In giving judgment, the Vice-Chancellor said he had no doubt about the case. As he had already said, the southern lights of the premises were not interfered with because of the distance of the new buildings from his property and the shape they assumed. As to the western lights, there was only one witness who said that he had suffered any damage by the diminution of light. The whole question of the western lights turned upon No. 100, because the wing of that place precluded the lights of the other houses being interfered with, and the tenant of this place gave notice to quit long after the present proceedings were instituted. On behalf of the defendants a number of gentlemen had been called to state that the property was not monetarily affected by the new buildings, and as the

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block was 63 feet from the windows he came to the conclusion that there was no injury to the lights, and that no case had been made out for relief. The action would therefore be dismissed, but he hoped costs would not be pressed against the plaintiff. Mr. Rotch said the Infirmary was a charity, and therefore they could not help pressing for costs.

### CLAY AS A MINERAL.

JUDGMENT was given on Saturday in the appeal to the House of Lords of the Corporation of Glasgow against Mr. Allan Farie, of Farme, Rutherglen, from a decision of the Court of Session in Scotland reversing a judgment of the Lord Ordinary. In 1871 the appellants, under the provisions of the Glasgow Waterworks Act, compulsorily purchased from the respondent a quantity of land, upon which they have subsequently constructed two large reservoirs for the purposes of their waterworks. The price which the appellants paid for the land was 11,000*l.*, and the purchase was made under the general provisions of the Waterworks Act, whereby the property in the coal, slate, and ironstone, and "other minerals" which might be beneath the land purchased should remain in the seller, and that they should not be paid for by the purchasers of the surface soil until the seller should give notice of his intention to work such minerals. Beneath the land so acquired by the appellants there lay a large quantity of clay, and in 1885 the respondent gave the appellants notice of his intention to work the clay as one of the minerals reserved to him under the Act. The appellants thereupon denied that clay was a mineral so reserved, and asserted that the property in it had passed to them when they purchased the surface of the land. Litigation having arisen between the parties in consequence of this dispute, the Lord Ordinary decided in favour of the appellants, but his decision was reversed by the Court of Session. The case was argued some time ago, when judgment was reserved.

Judgment has now been given reversing the decision of the Court below, the Lord Chancellor, Lord Watson, Lord Fitzgerald, Lord Herschell, and Lord MacNaghten being present.

The Lord Chancellor said he was satisfied with the view put forward by Lord Mure in the Court of Session.

Lord Watson said: I am unable to assent to the appellant's argument that in section 18 of the Waterworks Clauses Act, mines must be understood in the same sense which it has been

held to bear in the Statute of Elizabeth. Such may have been its original meaning, but it appears to me to be beyond question that for a very long period that has ceased to be the exclusive meaning, and that the word has been used in ordinary language to signify either the mineral substances which are excavated or mined, or excavations, whether subterranean or not, from which metallic ores and fossil substances are dug out. It does not occur to me that an open excavation of auriferous quartz would be generally described as a gold quarry. I think the people would naturally call it a mine. The whole framing of section 18 indicates, in my opinion, that the Legislature intended it to include minerals got by what has been termed mining proper. The clause excepts mines of slate, and also "other minerals," an expression which must at the least include rock strata of the same homogeneous character, and generally worked, or capable of being worked, by the same methods as slate. To adopt in section 18 and the corresponding railway clauses the same construction of "mines" which has been followed for the purpose of the English poor rate, would, in my opinion, lead to consequences which the Legislature cannot have contemplated. In that case the extent to which minerals in the lands were sold or excepted at the date of the conveyance would depend on the mode underground or opencast by which they might be found at some future and far distant time to be workable, or upon the method according to which the landowner might then choose to work them. These factors being indeterminate it would be well-nigh impossible at the date of the purchase to arrive at a fair estimate of the compensation payable for it. I cannot conceive that the Legislature, in using the expression "mines of slate," meant to distinguish between the different methods of getting it, and to enact that slate which may never be disturbed shall be taken and paid for at once if it would naturally be quarried, but shall not be taken and paid for until it is actually worked if it would naturally be got by means of an underground level. It was certainly within the contemplation of the Legislature that water or railway works may rest upon excepted minerals, because it is expressly provided that the undertakers or the company are to be entitled to such parts of these minerals as require to be excavated for the purpose of constructing their works. When a railway company or water undertaking excavates in order to obtain a foundation for their works there is no roof to the excepted minerals, and it is difficult to understand how in these circumstances they could be got by proper mining. I am

## Wilson's Patent Dioptrical Pavement Lights.

WILSON & CO. beg to call the attention of Architects and others to the superiority of Wilson's Patent Dioptrical Lenses for pavement and floor lights. These Lenses are constructed on strictly scientific principles, and have been approved by some of the highest authorities on Light. They are made of the Best English White Flint Glass of high refractive power, and transmit more light than any other form of Lens yet introduced. The reflecting surface being spherical, the rays of light are distributed in every direction.

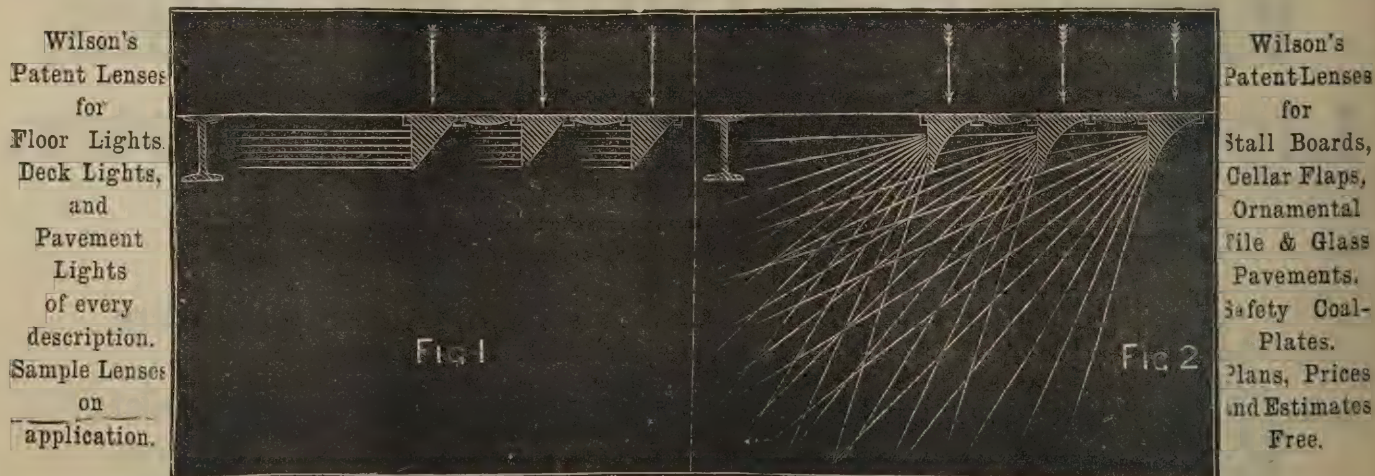


Fig. 1 shows how the ordinary prism or semi-prism, by receiving the rays on a plane reflecting surface, throws them forward at one angle only, in parallel lines close to the ceiling.

Fig. 2 represents the Patent Dioptrical Lens, and shows by comparison how the rays of light, striking on the curved inner surface, are reflected forward through the face of the lens in every direction, filling the whole angle of 90°, thus illuminating the apartment from floor to ceiling and from wall to wall.

From the above diagram it will be seen wherein consists the advantages claimed for Wilson's Patent Lenses. The objection to the semi-prism is that it reflects the light, as shown in Fig. 1, at such an angle as to be of little use, and more especially if the line of the ceiling is below the line of the pavement; then the value of the semi-prism as a light projector is entirely lost.

It will be seen also, on reference to the above diagrams, in Fig. 1 that the first row of semi-prisms obstructs the rays of light from each succeeding row, whereas in Fig. 2 the bulk of the rays of light are projected at such angles as to pass unobstructed into the room.

The correctness of these illustrations can be practically demonstrated to any architect desirous of testing them.

PRICE LISTS AND ESTIMATES ON APPLICATION TO

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accordingly of opinion that in this enactment the word "mines" must be taken to signify all excavations by which minerals may be legitimately worked and got. If coal, ironstone, or slate crops out at any part of the surface either for waterworks or railway purposes, the undertakers or company acquire, in my opinion, no right save the right to use that part of the surface; they acquire no right to the minerals themselves except in so far as these are dug out or excavated in order to construct their works. But an important question still remains—What are the minerals referred to other than coal, ironstone, or slate? My present impression is that "other minerals" must necessarily include all minerals which can reasonably be said to be *ejusdem generis* with any of those enumerated, slate being one of them. I do not think it would be possible to except freestone or limestone strata. I may add that, so far as I can see, it is possible that there may be some strata which would pass compulsorily to the purchaser if they lay on the surface, but may possibly be reserved to the seller if they occurred at some depth below it. I desire to say that in the view which I take of the present case it is not necessary to determine any of these points. The enactments in question describe the excepted mines of minerals as lying under the land compulsorily acquired, and they appear to me to contemplate that the purchasers, as soon as they obtain the conveyance, shall become the owners "of the land." That expression as it occurs in this enactment obviously refers to surface, and the question therefore arises what in ordinary acceptance is understood by the surface crust of the earth which overlies its mineral strata. It is of course conceded that vegetable mould, which commonly forms a large ingredient of the topmost layer of the crust, is not within the exception, but it is also the fact that in many districts the cultivable mould is mainly composed of clay, which is mineral in this sense that it is an inorganic substance. I have come to the conclusion that the expression "the land" cannot be restricted to vegetable mould or cultivated clay; that it naturally includes, and must be held to include, the upper soil, including the subsoil, whether it be clay, sand, or gravel, and that the exceptional depth of the subsoil, whilst it may enhance the compensation payable at the time, affords no ground for bringing it within the category of excepted minerals. I am accordingly of opinion the interlocutor of the First Division of the Court of Session ought to be reversed, and that of the Lord Ordinary restored.

Lord Herschell said: I have the misfortune to differ from the rest of your lordships who heard the arguments in

this case. I thought for some time that the language used must be construed as applying only to those seams or strata of the specified and other minerals which were capable of being wrought by underground workings. It seems to me that there is much to be said for that view, but after much reflection I do not feel that it affords a safe basis for decision, nor is it clear that it would assist the appellants. It must be remembered that it is part of the scheme of the statute that the undertakers do not purchase any right to the support of the underlying strata of minerals. No one has doubted that if they refuse to purchase the reserved minerals whatever is really within the reservation may be got, even though the result be to cause a serious subsidence and even dislocation of the surface. In this respect the case differs from an ordinary reservation in a deed unaffected by statutory provisions. In such a case the owner of the reserved minerals can only work such portion of them as can be removed without causing disturbance of the surface, or if he removed more he must provide some substituted means of support. Therefore, where it is suggested that the reservation in question embraces only such mineral seams as are capable of being worked underground, that cannot mean such as are capable of being so worked without disturbing the surface. Once this conclusion is arrived at, it is difficult to see any firm basis for a distinction between seams which lie at a considerable depth below the surface, the removal of which would be likely to affect it little, and those which lying near it could not be got without very seriously affecting it. What valid distinction could be drawn between a seam of coal or ironstone a hundred yards beneath the surface and one which came within 2 feet of it? And if the latter would be within the reservation, how can a seam of clay similarly situated be excluded? I have said that it is not clear that the proposed interpretation of the section would be of any advantage to the appellants, for proof not having been led I cannot assume that the clay might not be got otherwise than by surface operations by working on from the adjoining land, though, of course, its removal would cause subsidence and great disintegration of the surface. I own I have entertained very grave doubts as to the proper conclusion to be arrived at, but I do not see my way to differ from the agreement of the Court below. I think the reservation must be taken to extend to all such bodies of mineral substances lying together in seams, beds, or strata as are commonly worked for profit and have a value independent of the surface of the land. I desire to guard myself against being supposed to decide more

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### TESTIMONIALS.

SIR.—I have much pleasure in testifying to the efficiency of your patent warm-air fire-grate. It has been very successful, and given every satisfaction where I have used it. Yours, &c., JAMES WEIR, F.R.S.B.A., 6 John Street, Bedford Row, W.C.

From ARTHUR W. BLOMFIELD, M.A., Esq., Architect, 28 Montagu Square, London, W.

Mr. Grundy, of Tyldesley, near Manchester, has carried out his plan of warming in several churches built under my direction, and in each case it answers remarkably well, and has given great satisfaction.

From Professor W. B. ROBERTSON, M.D., West Dulwich, S.E., September 1, 1887.

DEAR MR. GRUNDY.—I value your apparatus very highly indeed. I regard it as the greatest comfort I have in this house.

From Rev. A. FERGUSON SMYLY, Dean of Derry, The Deanery, Derry, September 18, 1887.

DEAR SIR.—I cannot refuse to give you a few words of commendation as to the apparatus you supplied for heating Derry Cathedral. Not only is the air of the Cathedral quite pure and pleasant to those attending the services, as it must be from the fact that most of the air heated is taken from the outside, but I find the building itself is so much benefited, as formerly it was damp and smelt damp, but now it is very dry and free from any musty smell. I find that, although the Cathedral is now much larger, the cost of firing is much less.

To Mr. John Grundy, 30 Duncan Terrace, City Road, London.

From Hon. and Rev. G. G. C. TALBOT, M.A., Withington, Cheltenham.

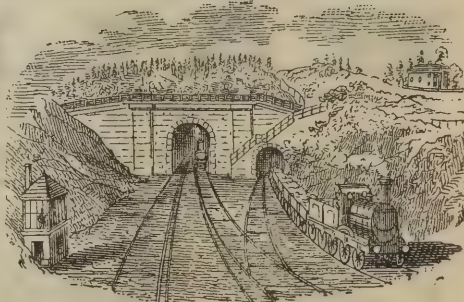
DEAR SIR.—You will be gratified to hear that the school is completely warmed by your new grate. It is the most economical and efficient that I have ever seen.

Mr. John Grundy.

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than I do. The pursuers in this action seek to interdict the defender altogether from working the clay under their land in any manner whatsoever. All that, in my opinion, arises for decision is whether they are entitled to do so. I say this because it was contended before us that inasmuch as the statute authorises the use of such part of the minerals as may be necessary for the pursuers' works—and the bed of clay forms the bottom and sides of their reservoir—the defender cannot be entitled to take away this clay. But the point, which is well worthy of consideration, does not appear to me to be raised at the present time. I therefore forbear from expressing any opinion upon it, or (assuming it to be well founded) upon the further question how much of the clay can be considered as their own for the purpose of the waterworks, and therefore as having become the property of the appellants. I think the interlocutor appealed from must be affirmed.

Lord MacNaghten, who concurred with the Lord Chancellor and Lord Watson, said he desired to base his judgment on what seemed to him to be the plain meaning of the words of the Act, but at the same time it was satisfactory to find that the result was consistent with what might be presumed to have been the intention of Parliament, and not likely to lead to inconvenient consequences. He was of opinion that the interlocutor under appeal should be reversed.

Their lordships accordingly by a majority reversed the interlocutor of the First Division of the Court of Session, and restored that of the Lord Ordinary.

#### PLUMBING REGULATIONS IN NEW YORK.

NEW specifications drawn up for the Board of Health for plumbing in the city of New York took effect in July as follows:—

The plumber will furnish all materials and perform all labour requisite and necessary for putting up and completing all the plumbing-work in a good and thoroughly workmanlike manner, according to the plans therefor as approved by the Board of Health. All materials will be of good quality and free from defects.

The ..... will properly close all openings in floors and ceilings about lines of drain and vent-pipe, so as to prevent the passage of foul odours from one floor to another along said lines of pipe.

The plumber will send notice to the Board of Health when the work will begin, and also at various times during the progress of said work before any part of it is permanently covered.

The plumber will properly protect all pipes and fixtures as soon as set, and close all pipe openings so as to prevent obstruction and damage.

The ..... will do all the excavating and refilling required for the proper carrying out of these specifications, except as such work is herein otherwise specifically provided for.

The plumber will obtain and pay for all necessary permits, and comply with all corporation laws relating to the subject matter of these specifications.

After the completion of the work under these plans and specifications, and before its final acceptance, the plumber must obtain the certificate of the Board of Health that there is no violation of law on record against said work, and also a water permit from the Department of Public Works. He will then turn on the water, and leave everything in perfect working order.

#### I.—MATERIALS, &C.

**Earthenware Pipe.**—All earthenware pipe herein specified must be hard, smooth, salt-glazed, and cylindrical, and not less than three-quarters of an inch in thickness. Each length will be perfectly straight and free from any fire cracks, flaws, blisters, or other defects. All special fittings to be of the same quality as the pipe.

**Cast-Iron Pipe.**—All cast-iron pipe and fittings must be sound, cylindrical, and smooth, free from cracks, sand-holes, and other defects, of a uniform thickness, and of the grade known in commerce as extra heavy. All iron pipe will be firmly secured in position by ... placed not less than ... feet apart. No tar-coated pipe will be used, but after the pipes have been tested and accepted by the inspector they will be coated with ..... The following average weights per lineal foot will be accepted:—2 inches, 5½ lbs. per lineal foot; 3 inches, 9½ lbs.; 4 inches, 13 lbs.; 5 inches, 17 lbs.; 6 inches, 20 lbs.; 7 inches, 27 lbs.; 8 inches, 33½ lbs.; 10 inches, 45 lbs.; 12 inches, 54 lbs. All joints in cast-iron pipe will be made with picked oakum and molten lead, and the plumber will make the joints impermeable to gases by bedding the lead with hammer and calking iron. For each joint in cast-iron pipe twelve ounces of lead must be used to each inch of diameter of the pipe in which the joint is made. No putty or cement joints will be permitted. The lead used for calking will be

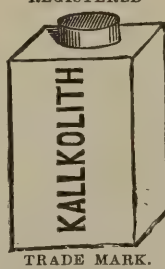
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*Wrought-Iron Pipe.*.....

*Lead Pipe.*—All lead soil, waste, and vent pipe will be drawn pipe of the best quality, and of the following weights per lineal foot..... All connections of lead with iron pipes will be made by brass ferrules of the same size as the lead pipe, set in the hub of the branch of the iron pipe and calked in with lead, the lead pipe to be attached to the ferrule by a proper solder-wiped joint when practicable. No putty or cement joints will be permitted. All connections of lead soil, waste and vent pipes will be made by wiped joints. All lead pipes will be firmly secured in place with hard metal tacks and screws, placed not less than ... feet apart; and all horizontal lead pipes will be well supported for their whole length by shelves or carrying strips, to be provided and put up by .....

II.—TESTS.

The plumber will test all of the soil, waste, drain and vent pipes herein described, in the presence of a plumbing inspector, and, after due notice to the Board of Health, by a pressure test, the pressure to be applied as directed by the inspector, and after all openings in the pipes have been securely closed by the master plumber or other person in charge of the work. None of said pipes shall be covered until after they have stood the test to the satisfaction of the inspector.

III.—CESSPOOLS AND SEWERS.

The ..... will construct in ..... at ..... feet from the building, a cesspool ... by ... and ... deep, with ... inch ... walls, and bottom made absolutely watertight by means of ..... The cesspool will be covered with ..... and ventilated by ..... No privy vaults or cesspools for sewage will be permitted where connection can be made with a public sewer.

*Private Sewers.*—Where there is no public sewer in the street, and it is necessary to construct a private sewer to connect with a public sewer in an adjacent street or avenue, it must be laid outside the curb under the roadway of the street on which the houses front, and not through the yards or under the houses. Such sewer will be constructed in the following manner:—

*House Sewers.—Excavation.*—The ..... will make the necessary excavations for the house sewer from the .... wall to the ... sewer in ....., making a smooth bottom for each

pipe, free from all projections of rock, and with the soil well rammed to prevent settling of the pipe.

*House Sewer—Earthenware.*—[NOTE.—The laying of earthenware drain-pipe for house sewers, in made or filled-in ground, is prohibited by the rules established by the Board of Health. But where the soil consists of a natural bed of loam, sand, or rock, it is permitted to be laid outside the cellar, vault, or area wall to the street sewer, if laid in strict compliance with the following directions.] The ..... will make a separate connection for each building with the ..... sewer by an earthenware pipe, ... inches in diameter, hard and salt-glazed, and ... of an inch thick, run at a uniform grade of not less than  $\frac{1}{4}$ -inch per foot, extending the same to a point not less than 2 feet outside of the outer face of the front cellar, vault, or area wall, as the case may be. Every section will be bedded in cement at the hub. The ends of the pipe will be wetted before applying the cement, and the space between each hub and the small end of the next section will be completely and uniformly filled with the best quality of hydraulic cement, care being taken to prevent any cement being forced into the drain to become an obstruction. No tempered up cement will be used. A straight edge will be used, and the different pipe sections laid in perfect line on the bottom and sides.

*House Sewer—of Iron.*—Or the plumber will make a separate connection for each building with ..... sewer in ..... by ..... inch extra heavy cast-iron pipe, run at a uniform grade of not less than  $\frac{1}{4}$ -inch per foot, to a point just inside of the ... cellar or vault wall, as the case may be. The house sewer, in each case, will be connected to the street sewer at a point directly in front of the house for which it is laid. Old sewers or house-drains can be used for new buildings only when found by a plumbing inspector to conform in all respects to the regulations governing new sewers and drains. They will in each case be uncovered for examination by the ..... Notice will be sent to the Health Department when any sewer or drain-pipe herein specified is ready for inspection, and it can be covered only after it has been examined and pronounced satisfactory by an inspector from the Board of Health. In filling the trench no stones will be placed in contact with the pipe, and the earth will be thoroughly packed in without moving the pipe in the slightest degree, or starting any of the joints.

IV.—HOUSE-DRAIN.

The plumber will make a proper connection with the house-sewer by extra heavy cast-iron pipe, and set a ... inch extra

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heavy cast-iron running, or half-S trap just inside of the front wall, with a handhole for cleaning, covered with a screw-cap, properly fitted. A fresh-air inlet of extra heavy cast-iron pipe, not less than 4 inches in diameter, will be provided and properly connected with the house-drain on the inlet side of the house-trap, and extended up flush with the sidewalk near the street curb, and properly covered by a galvanised iron grating leaded into the flagstone; or extended to ..... not less than ..... feet from any door or window, and opening at least 12 inches above finished grade, with cap, bend or grating. The ..... will build a ..... box or manhole with ... cover about the drain-trap, so as to make it readily accessible. The plumber will continue the house-drain of extra heavy cast-iron pipe ... inches in diameter, along the cellar wall or ceiling from trap to the point shown on the plan, giving it a uniform grade to the trap of not less than  $\frac{1}{4}$  inch per foot. The house-drain must not be laid beneath the cellar floor, unless the location of fixtures in the cellar or basement, or the drainage of yards, cellars or areas requires it to be so laid. Make necessary changes in direction by curved pipes, and all connections by Y branch pipes and one-eighth or one-sixteenth bends. From the points shown on the plan, branch pipes of extra heavy cast-iron, to be connected with the drain-pipe to receive the soil and waste-pipe, the rain-water leader and the connections from the area, cellar, and yard drains. All of said branch-pipes to be of the diameter hereinafter described and as shown on accompanying plan of cellar drainage. Where handholes for cleaning are provided on the house-drain or its branches or on the house-drain trap, proper ferrules with screw covers will be used and made gas-tight.

#### V.—SURFACE DRAINAGE, &C.

All yards, cellars, areas and light courts will be properly graded by the owner and drained as hereinafter specified. The traps for all such drains will be placed inside the cellar wall and made accessible. Cellars will not be connected with the house-drain unless absolutely necessary, dry cesspools being used where practicable. If connected to the house-drain, running taps with cut-off valves and proper water-supply will be provided for each connection, as follows:—The ..... will build in each yard, cellar, area, and light court, where shown on plans, a brick cesspool or catch basin, ..... by ..... by ..... made watertight if sewer-connected, and the plumber will set over each a ..... strainer, and make connections therewith as specified. Provide and set where shown on plans ... inch

extra heavy cast-iron yard drain, connecting with the house drain, and trapped by ... inch running trap. Provide and set where shown on plans ... inch area and light court drains connecting with the house-drain, and trapped by ... inch running trap. If found necessary to prevent dampness, the owner will make the cellar and foundation walls impervious thereto by means of asphaltum or coal-tar pitch and cement. Subsoil drains will be provided only where necessary. Their construction, trapping, and special provision for maintaining their trap will be as follows :..... stable drains.....

(To be continued.)

#### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

11235. Henry Darby, for "Improvements in window blind fittings and in the method of arranging or mounting and fixing same." August 3, 1888.

11238. Sidney Edwin Edmonds and William Timbrell, trading as W. E. Blackwell & Co., for "Improvements in catches or fasteners for doors, gates, French windows and the like." August 3, 1888.

11250. Thomas Carpenter Down, for "Improvements in, and relating to, window and rising latch fastenings." August 3, 1888.

11252. William Routledge, jun., for "Improvements in or relating to pencils." August 3, 1888.

11260. Richard Joseph Stevens, for "Improvements in sash fasteners." August 3, 1888.

11263. Frederick Hemmings, for "Improving the planning of terrace houses." August 3, 1888.

11271. "Improvements in apparatus for balancing and opening sashes, casements or ventilators." (Complete specification.) August 3, 1888.

11279. Julius Fejer, for "A detachable safety grate or trellis for windows." August 3, 1888.

11281. John William Marrs, for "An improved domestic fire-escape and alarm." August 3, 1888.

**NORTHERN**  
FIRE LIFE  
ESTAB<sup>d</sup> 1836  
**ASSURANCE COMPANY**  
HEAD OFFICES  
LONDON & ABERDEEN  
ACCUMULATED FUNDS (1888) £ 3,421,000.

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APPARATUS.**

**L. OPPERMANN,**  
Crown Works,  
**AMHURST ROAD, HACKNEY.**  
Telegrams—"Opmann, London."  
**PURCHASE HIRE SYSTEM.**



11290. Edward Young, for "Improvements in roofing tiles for the purposes of utility and ornament." August 4, 1888.

11296. John Ward, for "Improvements in fire-lighters." August 4, 1888.

11305. Henry Harmston, for "Improvements in loose block letters or numbers, and in the method of affixing the same to doors or any part of a building, or to any article as required." August 4, 1888.

11306. William George Howard, for "An improvement in window-fasteners." August 4, 1888.

11335. Richard Hawkes, for "Improvements in apparatus for flushing water-closets and urinals, and for other like purposes." August 4, 1888.

11362. Arthur Ostins, for "Self-closing window." August 7, 1888.

11364. James Matthew Matthews, for "Improvements for appliances for raising or lowering the glass frames of railway and other carriage-doors, and for other purposes, and for retaining or holding same in any desired position." August 7, 1888.

11372. Thomas William Aylesbury and James William Russell Wall, for "Improvements in service and cistern cocks for automatically preventing the waste of water." August 7, 1888.

11385. John Elton, for "Improvements in the manufacture of pencils." August 7, 1888.

11398. Peter Brentini, for "An improved compound for removing paint from painted surfaces." August 7, 1888.

11427. John Bell Millar, for "The construction underground of public urinals, water-closets, and lavatories for large cities and crowded thoroughfares." August 8, 1888.

11428. John Bell Millar, for "A special improvement in the discharge and overflow arrangements of baths manufactured of cast-iron." August 8, 1888.

11429. Joseph Parkinson, Charles Frederick Parkinson and Samuel Fawcett, for "An improvement in rules, T-squares, levels, and set squares, to enable them to be accurately set for indicating angles." August 8, 1888.

11446. Mary Elizabeth Sugden, for "Improvements in attaching and supporting window-curtains or short blinds." August 8, 1888.

11466. Charles Southon the younger, for "A metal cowl to prevent down-draughts and cause the air or smoke to ascend in chimneys, &c." August 8, 1888.

11477. John Horton, for "Leaded window-blind catch and fastener." August 9, 1888.

11483. George Henry Planner, for "A disinfecting apparatus for water-closets." August 9, 1888.

11502. Léon Elfege Portelance, for "Improvements in locks or fastenings." August 9, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

8307. Albert Barraclough, for "Improvements in metal pipes for hot-water apparatus and other purposes." June 7, 1888.

8376. Charles Edward Shepherd, for "Improvements in apparatus for determining the range of distant objects from a given point, also applicable as a surveying instrument to delineate inaccessible or accessible ground." June 8, 1888.

8829. John Fraser Calder, for "Improvements in cisterns for water supply to water-closets and other appliances." June 16, 1888.

8894. Joseph Bennett, for "Improvements in connection with pipes or channels for conveying gas." June 18, 1888.

9100. Robert Nelson, for "An improved blower for domestic and office fireplaces." June 21, 1888.

9181. William Köllmann and John Ferdinand Kayser, for "Holder for the cords of Venetian or other blinds, pulley blocks, and the like." June 23, 1888.

9780. "Improvements in racks applicable for holding the operating cords of window-blinds." July 5, 1888.

10066. Charles Darrah, for "Improvements in ventilators." July 11, 1888.

10081. Alfred Julian Boulton, for "Improvements in or relating to the application of paints or colours in imitation of wood graining." July 11, 1888.

10147. William Lucas and Thomas Alexander Garrett, for "Improvements in maps to facilitate the measurement of distances on them." July 12, 1888.

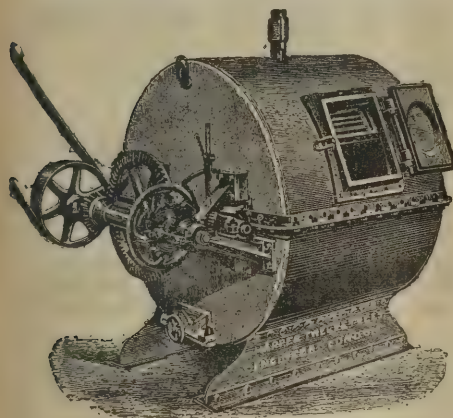
10459. William Harte, for "Improvements in fastenings for windows." July 19, 1888.

10532. Franz Genth, for "Improvements in water-closets." July 20, 1888.

10554. Frederick Sawyer Winsor, for "Improvements in flushing tanks or cisterns." July 20, 1888.

10654. Walter Russell Mortimer and James Holloway, for "Improvements in electric arc lamps." July 23, 1888.

10881. James Chandler, for "Improvements in the construction of locks." July 27, 1888.



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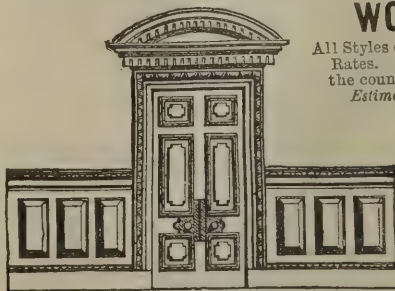
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Bayswater, London, W.



## COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of this journal, give notice at the Patent Office in the prescribed form of such opposition.

11237. Harry Noble and Geo. Haley, for "Improvements in the hearths of fireplaces, fenders, and dados, of metal and enamel." August 17, 1887.

11997. Henry Thwaites, for "A gravity pleasure railway." September 5, 1887.

13516. William Philip Willmot and Charles Jarrett, for "Improvements in and connected with desk or other flaps and seats." October 5, 1887.

13537. Thomas Constantine Fawcett, for "Improvements in brickmaking and brick-drying machinery." October 6, 1887.

13588. Lizzie Anna Walker, for "Improvements in or relating to the extinguishing of fire in theatres, mills, and other structures." October 7, 1887.

13680. James Season, for "Improvements in the construction of roofs." October 10, 1887.

17632. Hermann Muller, for "Improvements in and relating to roller shutters and blinds." December 22, 1887.

4518. John Henry Marston, for "Apparatus for opening and closing fanlights, skylights, or casements." March 24, 1888.

## PATENTS SEALED, AUGUST 10, 1888.

8761. Stuart Caradoc Munro, for "Improvements in locks and in keys for the same." June 17, 1887.

9421. Antonia Luiga Mora, for "Improvements in or connected with stops or guards applicable for use with carving-forks, or for securing doors or windows, or for other like purposes." July 2, 1887.

10562. Worthy Sargent, for "An improved water-waste preventer, for giving a flush and after-flush." July 30, 1888.

12168. Gustav Bay, for "A new or improved process for obtaining positive black lines, copies from positive tracings or negatives, by the action of light." September 8, 1887.

2152. Francis Obre Ferguson, for "Improvements in and connected with pencil-cases and drawing instruments." February 13, 1887.

2218. Joshua Stevens, for "Improvements in compasses, callipers, and analogous instruments." February 14, 1887.

## NOTES ON SPECIFICATIONS RECENTLY PUBLISHED.

"Improvements in and relating to fastenings to the doors of theatres, halls, and the like." No. 12603. 1887. William Baird, 43 Douglas Street, Glasgow. An invention for automatically unbolting doors by means of the pressure of a crowd, which, pushing against the doors, act as levers attached thereto, and which release the bolts which hold the doors. The bolts are arranged by means of cranks to shoot both top and bottom simultaneously.

*Claim 1.*—The combination of parts constituting the improved means for fastening and automatically unlocking the doors of theatres and the like, substantially as set forth.

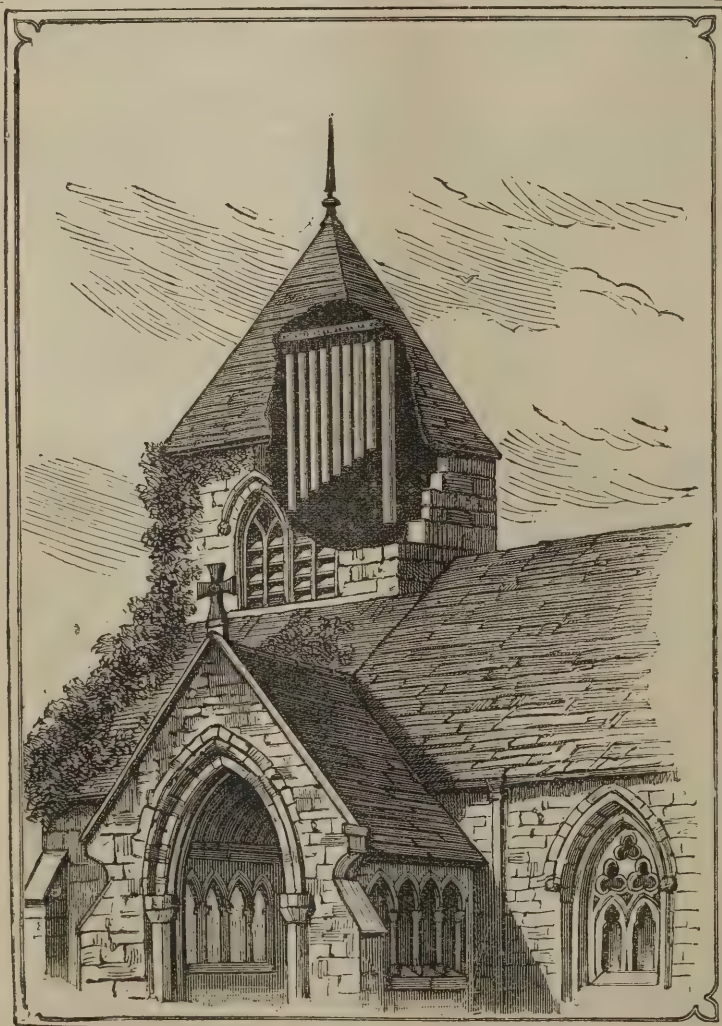
"Improvements in the construction of street gullies." No. 13877. 1887. William Bird, 5 Armley Hall, Oak Road, New Wortley, Leeds. The object of this invention is to provide for the easy ventilation or non-ventilation of street gullies, without disturbing pavement, &c., or interfering with the cleansing of such gullies.

*Claim.*—Gullies with a partition B and ventilating opening E, substantially as and for the purposes shown and described.

"An improved appliance for preventing down-draughts in chimneys and flues." No. 7957. 1888. J. B. Tonge, 27 Salt-house Road, Barrow-in-Furness. This appears an ingenious invention for the prevention of down-draughts, and consists of a frame built into the flue, having an opening at opposite sides of the same. To these openings are hinged flaps, one above the other, each at about an angle of 45 deg. The down-draught is caught on these, and forced out through openings, and any draught passing the upper flap is caught upon the second one, and thus a complete prevention of down-draught is obtained.

*Claim.*—The advantage of a sliding frame filling whole space of flue with dual system of flaps, rendering the downpour of smoke beyond the frame virtually impossible. Cheapness of production and easy of insertion. The curvature of the outer edges of the flaps obviating the difficulty of sweeping past the flaps, by affording easy access and withdrawal of machine. The method of fixing the frame into the flue.

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OVERMANTELS with MIRRORS, Fine Cast or Enamelled;  
REGISTER STOVES, Fine Cast or Berlin Blacked, with bright Bead  
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# The Architect.

## THE WEEK.

MR. GLADSTONE is no great connoisseur in pottery, if we may judge by his collection when it was seen at CHRISTIE'S, but he has aided in obtaining recognition for the merits of JOSIAH WEDGWOOD. Mr. GLADSTONE has not toned down his enthusiasm for the potter, and is not more precise in his praises than formerly. On Monday, in addressing a large body of men from the Pottery districts, he said that "WEDGWOOD was the greatest man who ever, in any age, or in any country, applied himself to the important work of uniting art with industrial development." The evidence for the statement or against it could not be brought forward unless in the compass of a goodly volume, and Mr. GLADSTONE is, therefore, safe in what he says. But when he talks of the union of art and industrialism by WEDGWOOD, does Mr. GLADSTONE mean English art? If so he is in error, for, considering the extent of his productions, no man could do less for English art than JOSIAH WEDGWOOD. Orators and writers who are ignorant of the subject work themselves into an ecstasy over the connection between WEDGWOOD and FLAXMAN. The truth is that the sculptor in those days was a poor man, and he was paid only a few shillings for a design. The designer of the Etruria Works was not FLAXMAN but WEDGWOOD. The potter could not draw but he could select, and he preferred HAMILTON'S "Vases" to his whole staff of designers. It was from that work he derived his inspiration, and, to say the least, it is absurd of a man like Mr. GLADSTONE to talk about the vases and cameos of WEDGWOOD as if they were the creations of a man "not taught by any former tradition." The fact is, WEDGWOOD'S work is all tradition, and we defy any one to point out either a contour or a scrap of decoration that can be traced to him. We are ready to acknowledge WEDGWOOD'S taste, his organising power, his readiness to sacrifice time and money in order to produce satisfactory work, his rigid supervision and suppression of defective pieces, but he was not an artist or a promoter of English art, and, indeed, with his way of doing business, artists are hardly necessary. They were employed by him only when he failed to possess an engraving that could be copied.

THE sale of Devizes Castle and the adjoining estate by Messrs. DEBENHAM, TEWSON, FARMER & BRIDGEWATER for the insignificant sum of 8,000*l.* may incite Americans to become possessors of historic places. Apparently antiquity is not much appreciated in England. The history of Devizes Castle is most interesting. As far back as 1107 a building was erected on the site. For centuries the castle belonged to English queens; but, like so many others, Devizes Castle never recovered from the injuries it sustained in a defence against CROMWELL'S Ironsides. A new building in the style of the ancient castle was erected on the site, and the late Mr. VALENTINE BAKER and his father must have expended over 80,000*l.* upon the residence. But although there was property independent of the castle and grounds which could be estimated at 270*l.* a year, the estate only realised the sum of 8,000*l.* At thirty years' purchase the extra property was worth that sum, and the costly castle with the grounds was therefore thrown in as valueless. In all their experience the auctioneers can hardly, we imagine, record a more remarkable sacrifice.

ARCHITECTS and builders, when they go holiday-making at this season, sometimes complain of the difficulty of emancipating their thoughts from business. In many cases it is an impossibility, and wise physicians often recommend that a part of every week (say a few hours or so a day) of the holiday should be definitely assigned to work. In the *Lancet* there is a note of a very ancient case, which suggests that it is not always an advantage to be entirely free from all thoughts of the toil which has to occupy a man during the greater part of the year. In other respects the note will be interesting as a scrap of the history of building, which suggests that in the second century the builder was not the

architect. It is as follows:—"Inhibitory paresis," says the *Lancet*, "may be induced by an infinity of causes—by cessation of mechanical work, change of locality, or both these conditions combined. This was noticed by the physicians of antiquity—by none more pointedly than by ARETÆUS, whose 'floruit' is placed by scholars about A.D. 150. In the chapter *περὶ μανίης* of his singularly thoughtful and well-written treatise he adduces the following instance. A house-constructor, as long as he was at work on the premises, proved himself a skilled artisan, capable of measuring, cutting, planing, joining, adapting, and finishing off correctly the woodwork of the house he was engaged upon; he would mix familiarly with the journeymen he hired (*ἐργοδότῃσι*), bargain with them, and pay them a just wage for their work. In this way, so long as he was on the scene of operations, he was in full possession of his faculties. But if he happened to go to the market-square, to the bathing establishment, or to any other place where necessity called him, he would no sooner have laid down his tools than he would begin to groan, then shrug his shoulders as he sallied forth, till he had got out of sight of his familiars and of the work and place he was employed at, whereupon he became a perfect madman (*πάντα ἐξεμάλινετο*). But he had only to come quickly back to the scene he had left, and at once he was in his right mind. Such, says ARETÆUS, was the association in his case between locality and reason."

ARRANGEMENTS have been made to exhibit the collection of architectural models and casts, panels, &c., collected by the late Mr. THOMAS LIDSTONE, diocesan surveyor of Dartmouth, at the Gymnasium, Dartmouth, by Mr. J. PARNELL LIDSTONE, son of the deceased, and Mr. ROBERT CRAFT, of the Library, Dartmouth. Many will be interested in seeing this collection, and persons who are desirous to avail themselves of the opportunity will be welcome. Tickets can be obtained of either of the above-named gentlemen.

THE Black and White Exhibition, which opens in Paris on October 1, will be held in the building in the Champs Elysées known as the Pavillon of the city of Paris, which is assigned for exhibitions of societies that do not possess special buildings. As the Black and White Exhibitions have successfully got through the years of infancy, the committee intend to be more exacting this year as to the quality of the drawings. A new feature will be the industrial designs. As all Frenchmen have a devotion for newspapers much interest will be taken in the spaces allotted to the illustrated journals, in which original drawings as well as reproductions will be seen. All works intended for exhibition must be sent in before September 10.

THE French Minister of Commerce has ordered a competition to be opened for a design for the diploma which is to be awarded to the successful exhibitors in next year's International Exhibition at Paris. The jury is made up of experts about whose judgment there can be no question. Among the members are MM. ALPHAND and BERGER, vice-presidents; MM. CHARLES GARNIER and PAUL SÉDILLE, the architects; M. GALLAND, the decorator; M. DELAUNAY, the painter; M. GUILLAUME, the sculptor; and MM. CHAPLAIN and ROTY, the engravers. There will be only a single prize awarded, viz., ten thousand francs to the author of the design which is recommended for adoption. It is to be hoped that the design will be engraved instead of being reproduced by one of the cheap processes.

THE decision of the jury of the Munich Exhibition has excited some surprise in Paris. M. BENJAMIN CONSTANT, who is one of the leading painters of the modern French school, has been awarded no more than a second-class medal. The reason probably is that he is a magnificent colourist, and his judges were colour-blind. M. COLLIN and M. BAUDE are placed in the same rank. The highest honours are awarded to M. FREMIET and M. COURTOIS, but they are not likely to attach much importance to their first-class medals, and will probably decline to accept them. Just now it is not profitable for a French artist to be esteemed by the Germans.



## THE PSYCHOLOGICAL BASIS OF FINE ART.\*

WHEN Dr. MARIGOLD said that from the Cheap Jack's point of view there was nothing more inspiring towards eloquence than a gun and a pair of spectacles, he was not only imparting information of a special kind, but he was revealing one of the secrets of the power of his creator, and, indeed, of all writers and artists in these latter days. Nobody knew better than CHARLES DICKENS when he wrote about the things which captivate the crowd if they are glorified properly from the Cheap Jack's cart, and that certain ways of making sentences have power over people, and will make them laugh or cry, be pitiful or angry—that is, if the subjects are rightly chosen. He had his own guns and spectacles, which never failed him, no matter how often they were introduced. A similar relation between cause and effect is to be seen wherever people are to be moved. Is there a comedian who has not his peculiar ways of forcing our laugh? Is there a painter who has made his mark without presenting to us repetitions of forms which to us are as welcome as the witticisms about the gun and the spectacles to the rustics in the market-place? Is there a successful designer of ornament having a claim to originality who is not always imitating himself? When the style of an architect is at any time popular, what is it but skill which makes some quality especially pleasing? in one case muscularity, in another finesse; here we admire the ornament, there the daring which is seen in a plain wall. It might be said that in literature and art what people are most glad to patronise is mannerism. It may take the form of CARLYLE's denunciations of talk, in language unlike any spoken on earth; or Mr. IRVING's elocution and gesture, which are no less remote from common life than CARLYLE's amorphous sentences; or Lord TENNYSON's verses, which have as little sustaining power as treble refined flour; or Sir J. E. MILLAIS's pictures of little girls; or Mr. NORMAN SHAW's dainty details, through which a square box would cease to be commonplace: the mannerism is not only the guinea stamp, but the gold also.

In many cases it is difficult to say whether the mannerism is not imposed by the patrons. Among actors it is not uncommon to meet with men who are as discontented with their success as LISTON himself. The public compelled them to take one line. MACREADY, who was more gifted than either KEAN or KEMBLE, never met with the recognition he merited because he would not persist in playing characters of the "Rob Roy" and "Virginius" types. His failure gave rise to the dissatisfaction seen in every page of his diaries. M. COQUELIN is unquestionably the first comedian on the French stage, but amateurs will not give him credit for power to create an original part, or to represent a man resembling the majority of those who are listening to him. Hence the pains he takes to assert himself by seizing on parts like "Brichandau" or "Un Parisien," for which he has not the physical qualifications. In painting and sculpture the power of outsiders is no less apparent. Hereafter Mr. Hook's ancient Venetian scenes will probably be most admired, but he is practically restricted now to the production of pictures made up of a patch of extremely blue sea, rocks of one kind in the foreground, and children of a peculiarly strong colour. The number of the figures in one of Sir J. E. MILLAIS's pictures would seem to be defined for him; Mr. MARKS must persist in painting old men—the drier the better; Mr. ORCHARDSON cannot henceforth venture to bring his figures together; patrons and dealers would be aghast if the President attempted a scene from English life.

The strength of opinion in modifying a man's power may be more forcibly seen in considering the fate of some foreign artists in England. M. FANTIN believes himself to be a flower painter; we are better judges here, and accordingly he is patronised as a portraitist. In France the late GUSTAVE DORÉ appeared to be a painter of small pictures; he succeeded in London by painting colossal representations of scenes from Scripture. If he cared for English patronage, M. BONNAT would probably discover that his forte was not in portraiture but in landscape. But

erroneous opinions are not peculiar to the English. The history of modern art in France presents many instances of artists who were compelled to keep in grooves at the dictation of the public, and of artists who failed because grooves were not discovered for them by the respectable people who assume the guardianship of art. It is as if a command were given by which Dr. MARIGOLD was always to discourse upon his guns and spectacles, and to sell the remainder of his stock on the sly and without public applause.

Any attempt to lay a psychological basis of art at the present day must take into account the relations between the artist and the people who profess to admire his work. To a great extent there is artificiality in the relationship, and accordingly the basis must appear to be on shifting sand rather than on solid rock. We do not therefore object to Mr. GRANGER's attempt to lay a foundation because we are not assured of the stability of what he does, since, under the conditions of the case, we doubt if ARISTOTLE himself (and for such a task he was worth a hundred PLATOS) could be successful. There are so many contingencies, that to lay a psychological basis of fine art seems as hopeless as to plant a lighthouse on the Goodwin Sands. Both works would bring advantages to us, and with our present knowledge both are impracticable.

In attempts of the kind it is, we believe, much wiser to begin with the artist, and to consider his psychology as such, than with what are known as "fine arts," and which have more or less indefiniteness. Mr. GRANGER, however, prefers the latter course, and he adopts the saying of LESSING, which is only second-hand, that "the object of the fine arts is to give pleasure." We suppose what is meant is pleasure to other people besides the artist. It is also taken for granted that the pleasure can be increased when it is taken in common, and no further proof is needed of the late King of BAVARIA's madness than to say that he had an opera performed for his special pleasure. Now experience does not warrant the belief of any universal law about the degree of pleasure being proportional to the number who participate in it. One of the discomforts of theatres and concert-halls is derived from the pleasure of some people who express their emotions at an inopportune time. The French, who know most about pleasures, and who delight in crowds, have taken the precaution to avoid disturbance by getting people to do the applause for them, and if Mr. GRANGER spent a night among the *claque*, he would, we are confident, cease to believe that impressions felt in common can "form a bond of sympathy." But taking that view arises, we imagine, because Mr. GRANGER depends upon what is said in books on psychology rather than upon his own experience. Now the man who is analysed in such books as those on political economy is a sort of algebraic being. Nobody ever met a man of the kind, and he can be endowed with as many or as few qualities as we desire. The artist of psychology is, therefore, a highly endowed being who can be made to aid morality or the reverse, according to the intention of the writer. Mr. GRANGER tries sometimes to steer a middle course, as in saying, "When a painter puts a miser on canvas, his object, so far as he has any beyond the pleasures of sight, is not to strengthen avarice, but to show it in a bad light." Why should a painter trouble himself about attempting to weaken avarice? It is not his business to set up as a moralist, and moreover, he would find economists and others who would tell him that the world owes much to avaricious men. The artist may set avarice in any light he pleases, if he will produce a good picture. The paintings which show things in a bad light are rarely esteemed after a little time. One HOGARTH can serve for centuries.

Although Mr. GRANGER takes so much pains to lay his psychological basis, he acknowledges that an artist can stand on something else. There is an absurd character in one of Mr. BLACK's novels, who is supposed to be a painter, and spends his leisure in reading abstruse volumes of German metaphysics; but we doubt if Sir FREDERICK LEIGHTON would acknowledge if he drew inspiration in that way. Mr. GRANGER is right when he says that "habit, not inference, is the best guide in life; no one, therefore, must expect that any collection of rules will make an artist," and that "the artist must be equipped with habits not rules." Indeed, it may be said that few men who have attempted

\* Notes on the Psychological Basis of Fine Art. By Frank Stephen Granger, M.A., A.R.I.B.A. Nottingham: James Bell.



to add cubits to their stature as artists by the exercise of composing essays on their art, have ever succeeded. They become over-fastidious, or think more of the mental process than of its realisation. Another good point in the book is that archæological lore is not over-prized. "Every departure from familiar usage," says Mr. GRANGER, "sacrifices a certain amount of suggestiveness, and unless this is compensated by the pleasures of novelty, of brilliant colouring, of romance, correctness of historical detail is a mistake from an artistic point of view. It may, however, in certain cases be demanded in order that incongruous associations shall not arise. It is surprising, however, with how little of this truthfulness the mind is satisfied."

In the same way the admirer of a picture need not trouble himself about the psychological basis of his admiration. We cannot suppose that the Athenians who first beheld the Parthenon and its sculpture were able to give an analysis of their feelings that would satisfy modern examiners in psychology; and on the other hand we may suppose that the examiner would hardly know what to think of the combined work of the architect and sculptor. In the nature of things the existence of an artist was contemplated, and those who are not capable to admire his works will hardly be taught by psychology. Mr. GRANGER has given a *résumé* of what is thought about the theory of art by one class of writers, and we hope his formulating of so many difficult thoughts will benefit him in his architectural studies. But that effect will be not only satisfactory, but novel. Psychology has not yet achieved victories by making better artists.

#### PERMANENCY OF WATER-COLOURS.

MR. J. C. ROBINSON writes as follows:—The ultimate results of the discussion on light and water-colours, as embodied in the recently issued Government Blue-book, are so interesting and important that it seems desirable they should not be passed over without further elucidation. As the movement was initiated by myself, and as I have had to bear not a little odium and misrepresentation in consequence, I think I may properly ask you to kindly allow me space for brief comment on certain points in the document just issued. There is now obviously no need for further controversy in the matter, for the experiments made at South Kensington have, I apprehend, conclusively settled the issues raised in the *Times*.

These experiments, at all events, have shown that water-colour drawings, as heretofore executed, must, as I maintained, be liable to fade from exposure to daylight, that my opponents were wrong in their contention, and that certain pigments brought in question, such, for instance, as indigo, are of a very fugitive nature, and should in consequence never have been made use of by water-colour artists.

We have now, then, reached firm ground in this matter and practical service has been rendered to art, the value of which it is difficult to overrate.

It is very important now, however, that the public should not be misled, so as to be induced to form erroneous conclusions from the scientific evidence placed before them. This evidence, rightly understood and construed, is in a great degree encouraging, both to the possessors of water-colour drawings and to the professors of the art. It indicates possible methods and contrivances by which the difficulties attending the conservation of fine works of former times may be overcome, and if at first sight it may seem to offer a less advantageous prospect to the practising artist, in practically debarring him from the further employment of many convenient and favourite pigments heretofore in common use, the difficulty will probably be only a momentary one. It will, I have little doubt, be speedily followed, now that science has in earnest taken up the question, by the discovery of substitutes of assured durability and even more brilliant tints for the unreliable colours to be discarded. In the meantime further State assistance in this particular matter would be a timely and great boon to artists in all vehicles, whether water-colours or oil. The enlargement of the scope of the present Commission or the appointment of a new one of chemists and other physical scientists, for the investigation of the best methods of preparation of artists' colours and the purveyance of new permanent pigments to replace certain essential colours which at present have no adequately durable representatives, would be amply justified by present circumstances.

As regards the exhaustive experiments now furnished, as to the relative stability or the contrary of pigments, there is little that was not already well known. Similar experiments have been conducted scores of times before with the same results. One matter only is new, but that is of great significance, and will be of the very highest practical importance in its conse-

quences, if further elucidation and trial should confirm it. This is the fact, not before noted, that all pigments, whether acted upon or not under ordinary conditions of exposure to light, seem to be alike permanent *in vacuo*. I shall return to this matter again, especially as it seems to hold forth possibilities of practical adaptation of immediate utility and urgent needfulness.

In the meantime, I must call attention to some deductions made by the South Kensington experimenters in their report. The public has eagerly seized on the somewhat vague assurance that under certain conditions of exhibition water-colour drawings will last 480 years. Now, it would be a melancholy prospect to me if I thought that even in 480 years all vestiges of the glorious English water-colour art of the early part of this century should have vanished from the world; but on a more careful scanning of the evidence given in the Blue-book it will be seen that it does not require 480 or even 48 years' exposure to light to effect such alteration in many of the colours formerly, and indeed still employed, in water-colour painting as must transform and practically destroy, as coherent works of art, any drawings in which such pigments have been more or less freely used. We find, indeed (p. 45 of the Report), that an exposure of less than two years even to the mitigated side light of an ordinary room sufficed to produce visible and in some cases very noticeable fading in all the fugitive pigments.

Now, unfortunately, the great water-colourists, the Turners, De Wints, Copley Fieldings, and Barretts of the early part of this century seem to have been utterly careless as to the colours they employed, and to have had no thought whatever for the prospective durability of their works. At that time even the most notoriously fugitive pigments, such as indigo, brown pink, gamboge, crimson lake, vandyke brown, &c., may almost be said to have formed the chief staple of the palette in use. The merest evanescent stains, moreover, such as sap green and gall stone, which have long since been discarded as utterly unfit for use as colouring substances, were then indeed currently employed, apparently without the slightest misgivings.

When therefore it is complacently assumed by writers in the press, on the strength of mere cursory perusal of the intricate and far from lucidly expressed calculations of the South Kensington scientists, that water-colour drawings, "if painted with any but the most fugitive colours," may last for 480 years, they are simply preparing a fool's paradise for the public, inasmuch as the saving proviso does not apply; for it is scarcely necessary to repeat that water-colour drawings were formerly painted in great part with fugitive colours.

There is, in fact, urgent need on all hands for measures of protection for these fleeting treasures. Happily, the Commission seems to have opened for us one door at least of escape. Should this prove a real and effectual one, it is scarcely too much to say that the chief disadvantages of water-colour art will have vanished like an evil dream.

The discovery that pigments are all alike stable in a vacuum doubtless indicates the real cause of the bleaching process induced by daylight; it is the action of the oxygen contained in the atmospheric air.

Broadly speaking, this action goes on in the light only, and is inoperative in the absence of light. We know, in fact, that water-colour drawings do not fade if kept in the dark. That pigments of mineral origin should, as a rule, be more permanent than those of an animal or vegetable nature is easily to be understood upon this theory; such pigments are for the most part either metallic oxides or inert earthy substances coloured by such oxides. Such substances are naturally stable, inasmuch as they may be assumed to have already taken up all the oxygen with which, under ordinary conditions, they are capable of combining.

Are there any chemical means by which the action of oxygen can be prevented or counteracted in the case of pigments of animal or vegetable bases? This is perhaps a pregnant question to which chemical science may yet give an affirmative answer.

What, for instance, are the means by which stability is attained for so many brilliant dyes used in textile manufactures? Some of the admirable and infinitely varied tints obtainable from the aniline bases, in their nature fleeting as rainbow hues, can, I believe, by chemical means be fixed and rendered permanent. Why should not artists, colour manufacturers, and merchants be called on to bring to bear the same scientific energy and resource which our textile manufacturers have developed? All this, however, may possibly not be necessary, for if the golden vision opened to us by the South Kensington Commission is a reality, the simplest mechanical contrivances may hereafter be sufficient to secure eternal durability to water-colour paintings.

Water-colour drawings are necessarily preserved in one or other of two ways—either they are kept in the dark in portfolios or they are hung up framed under glass. Now, if the entire exclusion of atmospheric air should prove to be the sole condition for securing exemption from fading, *cadit questio*, so far as that difficulty is concerned, for surely it ought to be a



simple matter to practically preserve drawings in a vacuum under glass. It would be a mere question of secure framing; possibly merely placing the drawing betwixt two sheets of glass in close contact with them under pressure, the edges of the glass being then hermetically sealed might suffice. Theoretically this seems all that is requisite.

In any case, no time should be lost in verifying the efficacy or the contrary of the remedy, which the researches of the South Kensington experimenters seem to have furnished. It is a momentous, indeed an all important, matter, for it may give new and endless leases of life to the immortal works of a past age, and glad assurance and much-needed stimulus to a living and most admirable art. In any case, good will most assuredly come from the raising of this question, and it is not for me to be otherwise than contented with the part I have taken in it.

### CHURCH PLATE IN WARWICKSHIRE.\*

I WISH, in the first place, to draw attention to the east window of the south aisle of Brinklow Church, once a chapel of the Blessed Sacrament. For as we gaze upon that window, covered with peerless illustrations of the golden chalices of our old national church, we are able to realise the beautiful enrichment of the altars of the cathedrals and parochial churches, when in the fourteenth and fifteenth, and early part of the sixteenth century, on high festivals they were adorned with communion plate of the highest excellence and of the best and most artistic workmanship.

To this church, worthy in many other respects of the visit of the archæologist and the historian, many an artist now comes to make drawings of the paintings of the old chalices, so that they may be reproduced in our own age, to be used for the honour and glory of God. The first account we possess of the communion plate of our parish church is the inventory of church goods made in 1552, by order of Edward VI. The inventories of our county I have carefully studied, and the first thing that struck me was the great devastation that had been made previous to that time in the stores of communion plate. For when we compare these records with the requirements enforced by many of our archbishops, as, for example, Archbishop Winchelsey, 1293-1313, in respect to the church goods of our parish churches, the amount of church plate recorded in them is exceedingly small. And when we add to the plate belonging to the parish church that which was used in the Lady and other chapels, and especially that belonging to the chantries which were so often attached to our churches, and where the Blessed Sacrament was daily celebrated, we see at a glance how considerable the church plate must have been that was found in each parish before the Reformation. At the dissolution of the chantries and chapels, the properties belonging to them were seized at once by the Royal Commissioners. Nothing was left that had belonged to them except the bare walls. Their endowments and church goods were taken by the Crown. Nothing therefore was left to its parish church, except that which could be proved to belong actually to it, in the way of endowments or of church goods. Still, much plate must have remained. But from the year 1536, in different ways, the church plate considerably diminished. Sometimes this was caused by the action of commissioners sent by royal authority; sometimes the plate was stolen. In a few instances a portion was sold for repairs and for defraying the necessary expenses entailed by altering the churches so as to make them adapted for the ritual of the reformed Prayer-book. Church plate also was sold to glaze and repair the windows, out of which the fine old painted glass had been ruthlessly taken away.

In the year 1454, commissioners were appointed to take surveys and inventories of the goods, plate, jewels, bells, and other ornaments in all churches and chapels in the realm. These commissioners were to leave one chalice in each church, together with a small portion of the other church goods, and at least one bell. The ostensible object of these commissioners was to insure the preservation of all church goods that remained. But behind the scenes we find that other causes promoted the course that was adopted. In the Council Book, March 3, of the same year, we find the following entry:—"It was that day agreed that, forasmuch as the King's Majesty has need presently of a mass of money, therefore commissions should be addressed in all shires of England, to take into the king's hands such plate as remaineth, to be applied to the king's use." And again, on April 21, Edward himself writes:—"It was agreed that commissioners should go out and take certificates of superfluous plate for mine use." The commissioners were therefore appointed, and we have their reports.

The first thing I would remark in reference to these reports is the exceedingly few chalices (each chalice had a cover,

used as a paten, therefore we will say chalices and patens) that they found. In only a very few churches were there two chalices. There was, for example, only one in the Warwick church. There was a fair amount of vestments, altar cloths, brass candlesticks, censers and holy waterpots, though around Coventry there were churches where nothing was left, as we have no inventory for them, so that there seems to have been hardly anything after paying the expenses of the commission to fill the needy pocket of the poor young king. During the reign of Mary the small amount of plate that remained, as far as we can learn, was safely kept, so we must arrive at the conclusion that when Elizabeth became queen most of our parish churches possessed a chalice of the old shape as well as other ornaments for the church and minister. The question then arises, "How came it to pass that all these old chalices have passed away?" The answer is as follows:—In 1559, Archbishop Parker inquired in the visitation articles, Question No. 5, "Whether the curate or minister do minister in any profane cups, bowls, dishes, or chalices heretofore used at mass, or else in a decent communion cup kept for that purpose." In 1576 Archbishop Grindall made the same inquiries. How Archbishop Parker, who ever loved primitive and ancient customs, could have issued the first of these questions passes my comprehension. If the brass censers used by Korah and his company were sanctified, even the greatest Puritan ought to have allowed, with the open Bible before him, that these chalices could not have been profaned, however superstitious the older rites might appear to him. The result was that the old chalices disappeared, so we find nothing remaining of them in the church plate that has come down to us from the sixteenth century, except in a few very rare instances.

Amongst the communion services of our county, I have personally examined the larger portion of them; a fair number of these Elizabethan communion cups still remain—perhaps some twenty or thirty. They are all, as usual, very much of the same pattern, and this resemblance of the Elizabethan chalice is somewhat curious, as we can find no pattern selected and ordered by authority to be used at this time, and yet all over the kingdom one pattern is to be found. Sometimes they are called the 5 $\frac{1}{2}$  cup, as 5 $\frac{1}{2}$  was allowed to poor parishes for the purchase of them. The cup has a cover, which, as Grindall tells his clergy, may be used as a paten. They are, as a rule, about 5 inches high, in some cases rather higher. A few years later on we find another shape sometimes used, which was called the Puritan pattern. The cup itself became enlarged, and the ornamentation of the stem was different.

Amongst the plate of the sixteenth century, I must mention the fine silver-gilt chalices, with cover, belonging to the Holy Trinity Church, Coventry. In some instances these old communion cups and covers have passed out of use, modern service, much less elegant and less adapted to the purpose, having supplanted them of their birthright. I am glad to say that in some instances I have been the means of bringing them back again to their proper place and use. With the advent of the nineteenth century, we find the use of flagons becoming frequent. I cannot but think that their introduction was caused by the Puritan method of partaking of the Holy Communion. From the beginning of the seventeenth century the shape of the chalice varied, and since then there has not been any regular shape or size of the chalice in general use. In Warwickshire the distinguishing feature of the church plate in the seventeenth century is seen in the magnificent Dudley plate, given by Alicia Lady Dudley, relict of Sir Robert Dudley, to those parishes in which she had property. The earliest gift seems to have been presented in about 1630, at latest 1665. This plate, as Archdeacon Lee says, much resembles the plate which is now to be seen at Seville and other cathedrals in Spain. It consists generally of one large chalice, the cup part ornamented with leaves. One paten, one large flagon, one deep bowl, which is, I imagine, the bason for the alms of the people, and a plate. The following entry in one of the registers will give a good description of these munificent gifts:—"Whereas Her Grace the Duchess of Dudley—a foreign title in the county of Middlesex—owner of lands and tenements in Mare Cliff and Barton, in this parish, hath out of her pious disposition and benevolence towards the church, freely given and bestowed this Communion plate, to wit: a large flagon, a bread bowl, and a great chalice (in other churches there are two plates), besides all three having covers belonging to them, the said plate being richly gilt, and garnished with pictures and flowers, for the use of the Holy Sacrament of the Lord's Supper, to be administered in the same church, as an ornament suitable for the service of that most sacred banquet. With and upon this condition, that the sacred plate shall for ever solely remain for the use aforesaid, and shall not be diverted, employed, or disposed of for any other use; and upon this further condition, that if at any time hereafter the vicar, churchwardens, or other officers or inhabitants of the said parish for the time being shall presume or endeavour to alienate, sell, or embezzle, or otherwise dispose of the plate aforesaid, or any

\* From a paper read by Rev. G. Miller, of Radway, at the meeting of the Royal Archæological Institute at Leamington.



part thereof for the use aforesaid, that these gifts above mentioned shall become void and frustrate, and that for thenceforth the propriety and property of the plate aforesaid shall revert and be vested in the said duchess, her heirs and assigns, who shall have lawful right, and may demand and sue for and recover the same or the value thereof, from the parties so alienating, selling, and embezzling, or otherwise disposing of the plate aforesaid."

In examining our church plate I cannot fail to notice how small a portion of it dates from the time of the Civil War. No doubt a good deal of the old plate disappeared at that time, partly by being abstracted from the churches, partly from being melted down to defray the expenses of the war and the necessities of the time. With the advent of peaceful days, after the Restoration in 1660, the churches were refurnished with communion services. But, unless I am much mistaken, a considerable portion was, through want of money, made of pewter. Still large gifts of silver plate were made, much of which is decidedly good of its kind. And when the Church had regained her position in the reign of Queen Anne, large gifts of plate were made and continued to be made till the middle of last century. During this period the plate of our shire was naturally much increased, and the beautiful specimens of silver gilt plate to be seen at Baginton and Cubbington belong to this period. As the century passed on, but few services of communion plate were added, and it was not again till after the peace of 1815, and when quieter times prevailed, that our churches were once more enriched with the pious gifts of her children. But here I must not omit to mention the Stoneleigh plate given in 1805. Since the great Church revival, which dates from 1835, numerous beautiful additions have been made to our church plate, and once again we see the form of the old chalice reappearing in our churches. Amongst these gifts of chalices stands pre-eminent that which belongs to the parish church of Leamington, which, though given in our own days, really belongs to the time of Henry VIII. The cup of the chalice is silver gilt, richly embossed with figures. Round the lower part of the cup are designs taken from the events in our Blessed Lord's life. On the central bosses of the stem are the figures of Faith, Hope, Charity, and Justice. Round the foot we see Eve in temptation, Melchizedek, Abraham, Moses striking the rock, and the Israelites gathering manna.

Besides this chalice, there is a second of later date, with grapes and wheat ears carved on it. It is said that this chalice was given by Henry VIII. to the church at Calais. But how it left its abode there and came to England does not appear. There is also a second chalice, which seems to have been obtained to match, as far as possible, the one I have just alluded to. It is of more modern date, but very handsome. The shaft has bosses ornamented with cherubs; on the foot are the emblems of the four Evangelists. The cup is enriched with carving put on like appliqué work. If of English make it is unique of its kind, being of the period when no chalices were made in England excepting in the shape of cups. I would hazard the opinion that it might have been obtained from abroad.

#### BISHAM ABBEY.\*

THE Manor of Bisham (anciently called Bisteham or Bustleham) was given to Henry de Ferrars by William the Conqueror, and Henry de Ferrars's grandson Robert gave it to the Knights Templars, who built a preceptory here in the reign of King Stephen. On the suppression of the order of Knights Templars it was granted to the Knights Hospitallers, who could not have held it long, for in 1335 King Edward III. granted it to William Montacute, Earl of Salisbury, who soon afterwards founded a monastery here for canons regular of the Order of St. Austin. In the foundation charter its dedication is described as to "our Lord and His Mother the Blessed Virgin;" in a subsequent charter to the "Blessed Virgin" only, but in both deeds of surrender it is styled "the conventual church of the Blessed Trinity." Of that church he knew of no reliable information, but it had been urged by some, but without, he thought, any sufficient reason, that the present hall may have been a part of it. It was certainly a very large church, as ancient records sufficiently testify, and it was the burial place of many a noble personage, amongst them William, Earl of Salisbury, son of the founder, who distinguished himself at Poitiers; John, Earl of Salisbury, who was slain at Cirencester in 1401; Thomas, Earl of Salisbury, who fell in the siege of Orleans in 1428; Richard Neville, Earl of Salisbury and Warwick, who was beheaded in 1460; Richard Neville, the great Earl of Warwick, and his brother John, who both fell at Barnet in 1470; and the unfortunate Edward Plantagenet, Earl of Warwick, beheaded in 1499. To the memory of these great men

splendid monuments are known to have been erected in the conventual church, but even their exalted rank and famed exploits were not sufficient to spare their monuments from the destruction which followed the dissolution of the monastery. The surrender to King Henry VIII., according to Ashmole, took place on July 5, 1536, "basely and contrary to the most solemn oaths," but the following year the King restored the convent, increased its possessions, and changed its establishment to an abbot and thirteen monks of the Benedictine Order. Only three years afterwards he suppressed it for ever, its revenues being then estimated at 661*l.* 14*s.* 9*d.* per annum. King Edward VI. granted the place to his father's repudiated wife, Anne of Cleve, who—according to a letter which is preserved in the British Museum—obtained permission to exchange it with Sir Philip Hoby for his house in Kent. Sir Philip, it may be presumed, built the Elizabethan mansion, as we now see it, as an addition to what remained of the old abbey, the principal features of the earlier work being the pointed doorway and the hall of the time of King Stephen. The large bow window in the room generally known as the Council Chamber was an addition thrown out by Sir Thomas Hoby for the better accommodation of the Princess—afterwards Queen—Elizabeth, who was placed here under the care of Sir Thomas. Sir Philip died in 1558, and his brother, Sir Thomas, in 1566, and the costly monument erected to their memory was to be seen in Bisham Church. The treatment received here by Elizabeth was not of a harsh or disagreeable character, for when Sir Thomas went to Court after Elizabeth's accession, the Queen is reported to have said to him, "If I had a prisoner whom I wanted most carefully watched, I should entrust him to your charge; if I had a prisoner I wished to be most tenderly treated, I should entrust him to your care." The Hoby family retained possession till 1768, when it passed to the Mills, who were connected with the Hobys by marriage, and in 1780 the widow of Sir John Hoby Mill, Bart., sold it to Mr. George Vansittart, and it still remains in the same family. It would be disappointing if there existed no ghost story in connection with the history of this grand old mansion, and this one item of interest is not wanting. The story is that Lady Hoby, the wife of Sir Philip Hoby, appearing in the dress of a widow lady of the sixteenth century, haunts a particular bedroom in this mansion, where she has been seen trying to wash her hands in a self-supported basin. She is said to have beaten her child to death because he could not write his copies without making blots. It is certainly remarkable that some forty years ago, when the window-shutters of the haunted room were being altered, a quantity of children's copy-books of the time of Elizabeth were discovered with blots answering to the story. In dry weather the burnt condition of the grass gives indication, he was told, of the existence of the foundations of the ancient abbey, and the moat around the garden still remains.

#### SOUTH KENSINGTON ESTATE.

IN connection with the proposed buildings upon the South Kensington Estate, a correspondent of the *Times* writes:—

Her Majesty's Commissioners for the Exhibition of 1851 have revised the plan they had framed for erecting the new College of Music buildings immediately at the back of the Royal Albert Hall. Sir George Grove and his staff have been granted a site on the Prince's Gate side of the Kensington estate, where, through Mr. Samson Fox's munificence, their new building is to be appropriately constructed. The road which is to be cut across the northern portion of the estate will run close past the new College of Music buildings, and in front of the memorial standing on the terrace above the fountains of the Anglo-Danish Exhibition gardens. The conservatory immediately below the hall is to be pulled down and the quadrant arcades flanking it are to disappear, and stately private residences to arise in their place. A narrow garden or court occupying only a portion of the site of the conservatory is to intervene between the two blocks of private residences. There will be no carriage roadway round this narrow garden—the northern side of it will be dominated by the Royal Albert Hall and its southern entrances. This arrangement has been made with the aim of rendering a public approach to the south of the Albert Hall virtually impossible, and of securing, therefore, greater privacy for the occupants of the stately residences. But even from the house speculator's point of view this plan is not good. The question therefore arises with those who are jealous of architectural proprieties and have some regard for the interests of the Albert Hall, whether Her Majesty's Commissioners are not committing an error in proposing to fall back upon a policy which lowered them some few years ago in public estimation. This may be called the policy of repudiation.

The laying out of their estate as a garden with surrounding arcades was the result of co-operation between the Commissioners and the public. The public took debentures to

\* From a paper read by Mr. S. Slingsby Stallwood, architect, Reading, at the excursion of the Berkshire Archaeological and Architectural Society.



enable the Commissioners to carry out this work. But when feeble administration ruined the Commissioners' projects respecting their garden, the Commissioners threw the debenture-holders over without remorse. Similar policy is now at work in respect of the seatholders of the Albert Hall—notwithstanding that without the seatholders' assistance the Commissioners could not have called that edifice into being. The Commissioners assert a right to freedom of action in this contemplated treatment of the seatholders, who, no doubt, will be compelled to give way before it. Present gains appear to be more important to the Commissioners than considerations of how their acquirement may affect the Albert Hall in the future.

With the destruction of the conservatory, some of the prettiest arcades in modelled terra-cotta and brickwork of modern times will be likewise razed to the ground. Except at considerable expense no analogous architectural embellishment to the southern end of the Albert Hall can be substituted for the flight of stairs and the arcades just referred to.

Such pressure as has been successfully brought to bear upon the Commissioners to prevent the ruin of architectural proprieties in respect of the Albert Hall may now be exerted in favour of the retention of the staircases and arcades within the doomed conservatory. The first and obvious point to be pressed is that, between the two blocks of private residences to be erected upon the quadrant terraces, a minimum width of space equal to that now covered by the conservatory shall be maintained. An effect of spaciousness would thus be secured, and would enhance the value of the new houses, whereas if the present plans be carried out the architectural merit of the Albert Hall would be foolishly impaired by crowding against it a series of domestic buildings which from their necessities cannot possess any corresponding dignity of style in harmony with the great hall erected to the memory of the Prince Consort. Upon a question of æsthetic importance such as this the Commissioners will no doubt seek the opinion of the President of the Royal Academy, who is an *ex-officio* member of their body. The Prince of Wales, who initiated and is causing to be carried out the scheme for adorning the open space opposite Hyde Park Corner, will hardly stand by and allow the Commissioners to disregard the architectural unities of the Royal Albert Hall, the Imperial Institute, and the intervening new structures. If necessary an appeal to wealthy benefactors might be made for means to enable His Royal Highness to do at South Kensington what he is doing at Hyde Park Corner. The cost of the former would be considerably less than that of the latter. Five thousand pounds would probably be more than enough.

#### THE SOUTH WALES ART SOCIETY.

THIS Society, which has been lately founded by the energy of Mr. Edwin Seward, of Cardiff, has already gathered together a numerous body of those representative of art in the district. Lord Windsor is the president.

Mr. Walter Severn, the president of the Dudley Gallery, one of the first of London artists to associate himself with the South Wales Art Society, of which he and Mr. Seward are vice-presidents, has lately paid a visit to Cardiff, and during his stay was the guest of Mr. Seward. Mr. Severn inherits a name which in art circles holds a place of its own. Linked by family ties with that of John Ruskin, it is perhaps still better known in connection with that of John Keats, the author of "Endymion" and the "Ode to a Grecian Urn," who was long the bosom friend of Mr. Walter Severn's father. An introduction to Mr. Severn used to be the best of passports to all that was sound and good in the artist life of Rome, where he was for years the British consul. Half a century ago many a young artist discovered the benefits of an acquaintance with the well-known and genial artist-consul. Keats in his last illness accompanied Mr. Severn to Rome, but he died in a few weeks, and was interred in the English cemetery near the monument of Caius Cestius, and where Mr. Severn was afterwards buried by his side. Mr. Arthur Severn, a member of the Council of the Royal Institute of Painters in Water-Colours, is a brother of Mr. Walter Severn, and his drawings, especially of sea and coast scenery, will be well remembered by visitors to the Grosvenor Gallery and the Institute of Painters in Water-Colours.

On occasion of the visit of Mr. Severn, the President arranged a reception of the members at St. Fagan's Castle on Wednesday last, when Mr. Severn delivered an address on "Water-colour Sketching from Nature," about 100 members being present.

Lord Windsor in receiving the party said:—I am extremely glad to have this opportunity of welcoming you to these grounds of St. Fagan's Castle. You have been kind enough to invite me to become the president of this association, and I thank you very much for the opportunity you have given me of showing to all my neighbours in this part of the country and South Wales

how very much the duty is congenial to me. I think we have before us in this club a great deal of work to do, because we have to begin from the beginning. There has not been in the past exactly a home of art in South Wales, and, no doubt, we find some little difficulty in starting to combine all the talent and the interest we desire to combine in our association, but I feel certain, from the information that I have received from Mr. Seward, that the start of the club has been a very good one. I hear from Mr. Seward that very great interest has been manifested in the club, and that many meetings, both for lectures and for working out of doors, have already taken place, and I feel confident that with all the support that the members are anxious to give, our club will shortly take a prominent place in South Wales. We owe our special thanks this afternoon to Mr. Walter Severn for having very kindly consented to come down here to give us a lecture on matters intimately connected with the working of a sketching club. I am sure that no one can recognise more thoroughly than I do that it is of the utmost importance to us to get the countenance and support of artists of note and position in this country. We combine in our club several branches, several different states and degrees of artists. We embrace in our club professional artists, amateurs, and also students. These are placed in different classes. Our principal object is to endeavour to give the students of the club some means of enlarging their knowledge and their powers, and we can only hope to do this successfully if help is given to us by the artists of this country, who have a thorough knowledge of their profession, and who alone are able to give us thoroughly artistic advice.

Mr. Severn began his subject with remarks more particularly of local interest. Cardiff, he had been told, was a tremendously busy place, so busy, indeed, that the town had no time for art. In this connection he would remind Cardifians that "all work and no play made Jack a dull boy," and apart from that, there was the fact that the number of cultured people in the world was increasing enormously, and those people required that everything to be done for them should be done with taste. The manufacturers who could not satisfy this fastidiousness would be left behind, so that even in commercial centres it would be wise to cultivate taste, which, after all, was only another word for art. Giving the results of many years' experience, he dealt with the study of sketching from Nature from all points of view. To paint what was called a complete sketch it was necessary to catch Nature, as it were, and reproduce her in one particular mood. Ruskin, who had written so usefully about careful work and finish, said, "Good painting can only be acquired by rapid and varied practice from Nature." He explained how rapidity of execution could be best attained, particular reference being made to throwing in the shades, and passing under review such matters as lights, stippling, glazing, tones, and perspective, emphasising the need of having in the selection of subjects what the Italians call a *motivo*. In concluding he advised students to lose no opportunity of observing Nature alone. Of the student of art it ought to be said, "Never less alone than when alone."

On the motion of Lord Windsor, seconded by Mr. T. H. Thomas, a vote of thanks was passed to Mr. Severn, and likewise to the President, in proposing which Mr. Seward stated that Lord Windsor had kindly consented to send some of his drawings to the exhibition which it was intended to open at Cardiff next month, and also to permit a magnificent bronze Mercury to be used in the decoration of the art gallery. Lord Bute, too, had very generously intimated that he would subscribe 10% to the funds of the Society on account of the exhibition.

#### TESSERÆ.

Chancels in Italy.

A. ASHPITEL.

I WATCHED the practice in different towns in Italy, and there found, invariably, that the laity, men and women, entered what we should call the different chancels, when mass was said, and took their seats in the stalls or wherever was most convenient. On inquiring further I found this was and had been always an invariable custom, and still further discovered the word chancel is never applied to any portion of the building, but only to the gates and railings, "cancelli," which separate the various chapels from the other parts of the church; that what we call the choir is by them called by its primitive name "tribune"—the ancient *βήμα*; and that the "coro" or choir is in any place, side chapel or otherwise, where it may be conveniently held, and, besides this, that it is shifted from place to place at different times according to weather, and not only so, but that in most cases it ceases to be called the choir when the choir, or monks who form the choir and who sing the breviary services, have left it. But still, and here seems the point whence all these errors have arisen, while it is a choir—that is, while the breviary or choir services are going on—the gates or "cancelli" are carefully closed; sometimes



curtains are drawn before them, and the laity are always rigidly excluded. A still more striking instance is found in the Jesuit churches, which are all built without chancels or choirs. Ignatius Loyola found the system of assembling every three hours for short services so interfered with the life of active exertion which he required from all his followers, that this obligation is omitted in his constitutions, and, as thereby choirs would have been useless, they are never erected in Jesuit churches.

#### The White Ground in Painting.

W. LINTON.

Wax was the most important ingredient in the vehicles for painting employed by the ancients. Its use is traceable from the early ages of Egypt, and throughout those of Greek and Roman art. It was extensively and almost exclusively used by the early Christian painters, and continued to be commonly employed till a late period in the Middle Ages. There is also abundant evidence of the use of resins by the ancients, and the employment of such substances among the ingredients for painting, as well as for varnishes, was continued after the invention and improvement of oil-painting. The process which has been found most satisfactory is that which excludes the fixed oils as much as possible, substituting for them wax, resin, and an essential oil. As a first condition affecting the durability and brilliancy of the work, a ground of pure white is recommended. In this the practice of remote antiquity has been confirmed by the best modern authorities. The Egyptians, in the preparation of the surface for painting on walls and on mummy cases, have left proofs of the estimation in which white grounds were held in the earliest times. The practice of the Greeks and Romans is exemplified by the prepared white tablet which was found among the ruins of Herculaneum. Aristotle among the ancients, and Leonardo da Vinci and Armenini among modern writers, speak of white grounds as essential to the brightness and durability of pictures. Caravaggio and others of the "Tenebrosi," on the contrary, who were instrumental to the decline of art by employing dark grounds, have proved that the effects of time are accelerated by that practice. Many of the works of Tintoret have suffered from the same cause.

#### Dampness in Foundations.

VANDOEYER.

A wall constructed of brick or stone of any quality whatever will be subject to the damp which exists in the soil, and which will enter in all directions and in all parts, where the wall is in immediate contact with the ground. The extent to which this damp will penetrate cannot be determined, and it may rise to a very great height above the level of the soil; and if it be arrested more or less, that will be caused by the influence of the neutralising power of the temperature of the atmosphere; so that a wall which may be very damp at the beginning of summer will be much less so at the end of the dry season, and particularly so if immediately exposed to the sun, but the following winter the damp will return unless the original causes of humidity be subdued. It is desirable in all and every class of soil to have a substratum of concrete under the footings. For the purposes of damp this need not be very deep, perhaps not exceeding a foot high. As soon as the footings and lower part of the wall are carried as high as the level of the ground inside it will be well to introduce a thin sheet of lead the whole thickness of the wall, or a layer of bituminous substance as thin as possible, so as to penetrate the brick and stone and fill the pores, or a double course of thick slate set in cement. The purpose of the sheet of lead and of the bituminous substance, and the slating, is to prevent the wet from rising up from the footings. But other precautions are necessary to prevent the access of damp from the surface of the ground next the outside face of the wall. A facing of stone is the best remedy. It need not be very thick, but it is well for it to be at least 2 or 3 feet high; and if a small interval between this facing slab and outside surface of the wall, so much the better, providing a circulation of air be kept up in the space. By this provision neither the rain beating against this part of the wall, nor the water returning from the pavement or ground, will be able to reach the main substance of the wall; for although the facing slabs may be temporarily damped, they will soon be dried without communicating the damp to the body of the wall. The inside of external walls should never have the plastering applied immediately on the face. They should be battened by means of long narrow slips of wood attached by hold-fasts to the inside face of the wall. These slips or battens receive the laths upon which the plastering is applied. The space formed by the battens between the wall and the lathing effectually keeps out the humidity. No impervious covering should be laid on wooden floors in the lowermost storey, such as oil-cloth, for instance; a certain moist air always rises from the ground, and escapes through the joints of the boards, but if this be intercepted by an oil-cloth, the air will rot the boards and oil-cloth in a very few months. But it is important to

keep the damp from the floors which come upon the ground, that is, the floors of the lowermost storey. It is evident that the timber of stone slabs should not be in immediate contact with the soil. For this purpose let a stratum of concrete be laid over the whole surface of the house, 6 or 9 inches thick at the least. Upon this form sleeper walls or piers up to the necessary height, and on them lay the plates or paving slabs. As an additional precaution, a thin sheet of lead might be laid under each pier on the bed of the sleeper walls. In palaces, as a greater precaution, and in buildings where expense is a secondary object, a thickness of asphalt might be laid on the concrete. In the dwellings of the poor it is expedient at all events to have the sleeper walls or piers, which need be only half brick wide and one course high, without the cement, and generally that will be a sufficient precaution. Where stone paving forms the floor bricks must be laid under all the joints. Thus will the humidity be more or less prevented from reaching the floors. But of all precautions to prevent damp entering by the face of the wall, the best remedy is to have an area, which, by keeping the soil at a distance, preclude its fatal effects on the wall. These areas may be 3 or more feet wide, and may serve as a passage all round the building, and afford access to cellars outside, as in the London houses; or if this, from want of space or the expense, be impracticable, it will be sufficient to have what are called blind areas, with convex walls against the earth, the points of contact with the outer wall of the house being as small as possible, to diminish the possibility of the communication of damp.

#### National Style.

R. REDGRAVE.

Style, indeed, will be universal in proportion as the sentiment which inspires it is more or less widely prevalent, more or less akin to our common nature; and on this account those styles which have arisen out of the religious sentiment are generally co-extensive with the religion which produced them. When these influences arise out of the purer and nobler qualities of man's nature, the style they produce will be noble also, and being constantly around us, contribute in no small degree to raise the tone of individual and national feeling. The influence of a mean style, founded upon the ignoble or sensual qualities, will in a like degree tend to degrade not only our taste but our moral intellect also. Thus the governing influences of Greece, when her art was formed, were the worship of the Deity through his created forms and attributes of beauty; and a sentiment of purity and beauty became the characteristic of Greek art. In the latter days of this people, when the poetical religion gave way before the subtilty of her philosophers, the sense of the beautiful only remained, and the principle of her art, deprived of the zealous fire that even an imperfect religious sentiment inspires, became more sensual under the domination of abstract beauty only. When the Greeks were conquered by the Romans, and their artists transplanted to serve the conquerors, they brought with them their own dominant principle, sensuous beauty. This, however, alone, ill suited the spirit of their proud rulers. In the full career of universal conquest, pomp and splendour were their governing influences, and a new style was formed, wherein a degree of barbarous grandeur dominated over the element of beauty. As the Romans, from being the conquerors became the conquered, their art died out under the mean and contemptible desire to appear what they no longer were; having no influence sufficiently strong to inspire their artists, they became degraded imitators, and even broke down the mighty works of their fathers to build trophies to call after their own names. The all-pervading spirit which had been present in the growth of Roman art being gone, Europe was ready for the new influence which, gradually working on society, was to pervade all the nations in various degrees with the spirit of Christianity, and to produce the new styles called Romanesque and Gothic, wherein the sentiment of religion again largely prevailed. And perhaps the very circumstance that religion was presented by means of art materially to the senses, rather than spiritually to the reason and intellect, increased the universality of the influence. Not only had the churches, but the houses and all the worldly goods of our fathers, the outward impress of these new styles, which appearing first in the erection and decoration of splendid temples devoted to the worship of the Deity, gradually gave to all things an ecclesiastical character also. When, from the causes before glanced at, the Renaissance of ancient art took place, it was impossible that any sentiment of religion, which, in its own age, it might have possessed, could be reborn with it; the beautiful only was sought in this revival; beauty, however, more or less tainted with the sensuality and pride of the peoples from the study of whose remains the resurrection to new life had been attempted. Revived without a thorough identity between the sentiment of the age, and the sentiment of the past which produced it, this style became at once subject to national modifications. In our own country it resulted in the Tudor, a style redundant yet mean, grotesque without ingenuity, and without any constructive truth or consistency. It bore the impress of a people



willing to borrow their art at second-hand rather than to endeavour to cultivate it at home. Flemish, Italian, and French versions of the Renaissance were mixed up in a strange medley with the Gothic of the preceding age, and it had a character arising out of its very errors and absurdities.

#### French Realistic Painting.

C. GINDRIEZ.

All these great art-problems are mostly questions of temper, and the naturalist school would only be unfaithful to its principles if it should wage war against tendencies the first reason of which might be found in nature and physiology. It is certain, for instance, that man's beauty is more accentuated in proportion as it differs more widely from the apeish characters: anything that brings him nearer to them gives him an ignoble and bestial appearance. Man's beauty evidently tends to an ideal which is the type of the race—a type which is never perfectly realised, but for which we have a right to seek. Plato puts this ideal behind us, and Mr. Darwin puts it before us: there is only a difference of position. We do not go further and further from it; probably we tend to it: at any rate it exists. We certainly take an interest in all the scenes of life, whether it be high or humble, opulent or poor, heroic or vicious; hence the development which modern art and literature have taken in France. But notwithstanding the present popularity of brutal realism, with its cynic nakedness and violent crudity, it has little chance of growing strong and of striking deep roots in our soil. The French genius is realistic neither in philosophy, in literature, nor in politics. It is curious that the French, who have often been reproached so justly with restricting the world to the limits of their own country, should have in the domain of ideas an irresistible need of expansion and generalisation. Whoever speaks eloquently or wittily of the French is popular in France; but whoever speaks thus of humanity is more popular still. It is at once the quality and the defect of the national mind, that Frenchmen believe themselves made to be listened to by the whole world. They have waged wars for ideas; their painting is more general than any other in the world; their revolution in philosophy (the Cartesian) was more general than that of Bacon; their political revolution has consecrated not only the rights of France, but especially the rights of humanity. It is this love for abstraction which keeps up among the French a taste for what they call "great painting"—that is, painting without any anecdotic or local character. We may say that France is now the only country in Europe where historical painting still reigns with a sort of religious respect and official lustre. It would have been dead a long while since, here as elsewhere, had it not been for State encouragement. Our houses are too small for those large canvases, which lack air in our modern rooms, narrow and multiplied as cells in a bee-hive; therefore historical painting is dying, notwithstanding the artificial processes which give it a sort of galvanic life. But, nevertheless, some valorous artists still dream of Michel Angelo, Raphael, Rome, and Florence, and cover with painting a few fathoms of the walls in the Salon. It is the tradition; historical painting is in their blood, and they have aptitudes accumulated by heredity. However, the science of nudity is drifting more and more away from nature; we feel too much that the art created by our artists is secondhand, and that their painting lives upon remembrances.

#### The Alhambra and the Mosque of Cordova.

F. Y. HURLSTONE.

Elegant and beautiful as it is, the Alhambra was a work of the decadence of the Moorish architecture. It was erected the last, and not until after the fall of the brilliant empire of Cordova, its superior in arts, in science, and in arms, as well as those of Valencia and Seville. Its foundation was, indeed, the result of the fall of this latter kingdom or pachalic. One circumstance alone, although it is descending to minutiae, bespeaks the inferiority of the Alhambra as an architectural monument to the Mesquita of Cordova and the earlier Moorish works. It is that the ornamentation (which is the prominent feature of the style) is of necessity one of lath and plaster, which could not be executed in stone. There is the beautiful honeycomb ornament for instance, which imparts such a charm to the Hall of the Ambassadors, it would be impossible to express in stone. As also, the essential dependence of this style of ornamentation upon colour, of which a striking illustration may be seen in the archway of the ancient Moorish palace of Bâdis, now called the Casa del Carbon, on the Darro, which is as fine as anything in the Alhambra, in fact is identical with the best of it, but having been whitewashed it loses more than half its value; whereas the ornamentation of the Mesquita of Cordova, no less charming in taste, is wholly produced in stone cutting, as the beautiful interlaced ribbon ornament, &c. From the accounts drawn from both Arabic and Spanish sources, as well as from those traces, faint indeed, but unmistakable, presented by remains like the Mesquita of Cordova and the Giralda, if not the Alcazar of Seville, the Arab architecture had attained a far

higher perfection than the Alhambra of Granada would evince. Notwithstanding the mutilations, and, what is worse, the disfiguring additions to the Mesquita of Cordova, it is evidence of the surpassing genius of the Moors. Startling from its novelty, and the inventive powers displayed, it remains one of the most impressive monuments in Europe. It is, indeed, worthy of a journey to see it—to form an idea of the effect of its naves and transepts, its intersections of nineteen longitudinal rows of columns, with twenty-nine transverse rows, originally twelve hundred columns. The labyrinth of these colonnades over an extent of 2,400 feet is utterly bewildering, as it is unequalled. For myself, I must say that I never was so impressed with any building, on first entrance, as the Moorish mosque of Cordova. The choir, or whatever that portion of the building was in the time of the Moors, was unfortunately altered by the bishop, and against the judgment of the corporation, so late as the time of Charles V., who, in this instance, reproved what he himself afterwards did at the Alhambra:—"You have built here what you or anyone might have built anywhere else, but you have destroyed what was unique in the world. You have pulled down what was complete, and you have begun what you cannot finish." The alteration is in the Florid Gothic, in its last and expiring form, in the beginning of Charles V.'s reign. It is not undeserving of admiration in itself, and is less incongruous than might have been expected with that curious monument.

#### Flow of Water through Pipes.

J. NEVILLE.

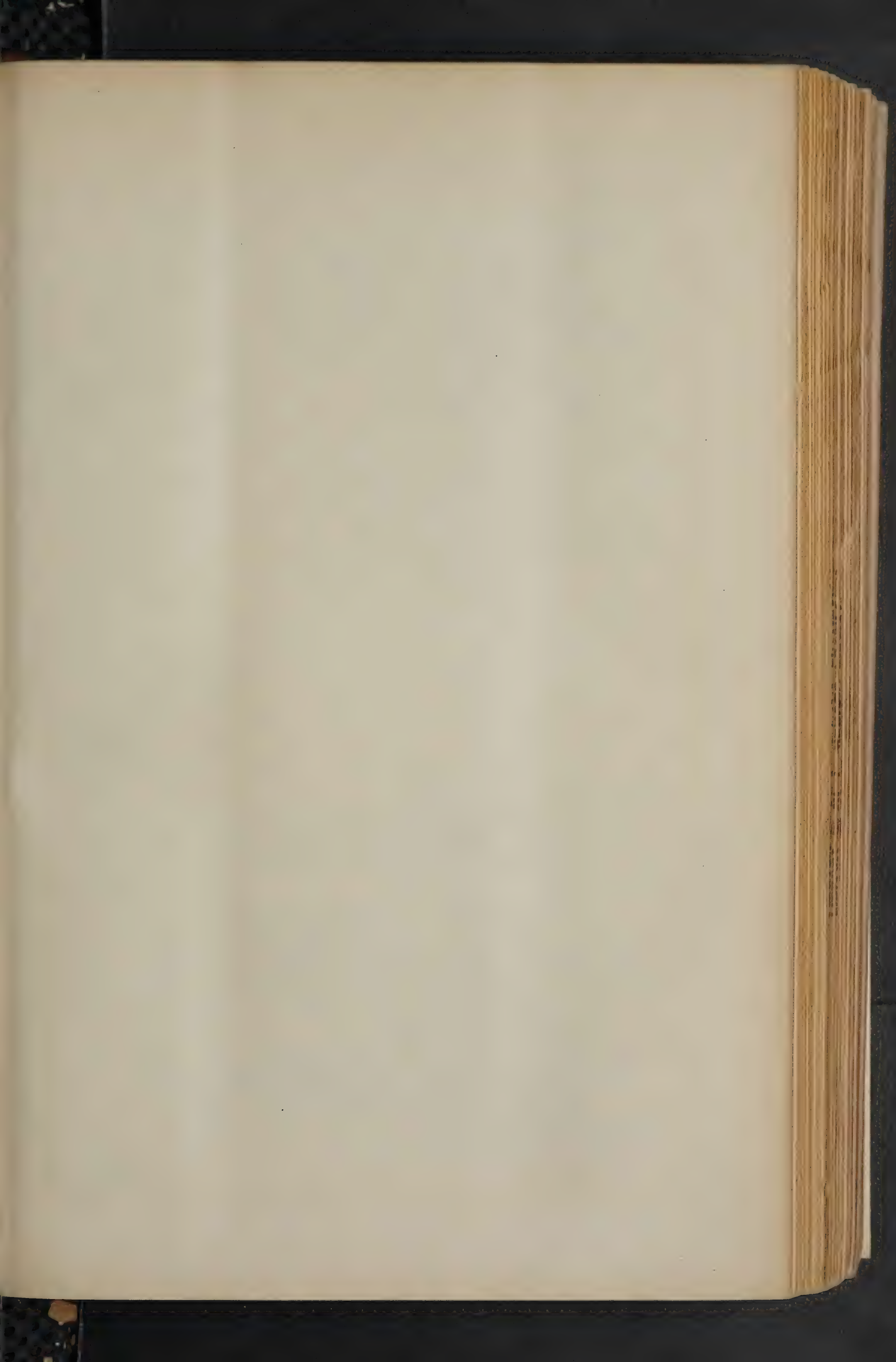
A cylindrical pipe, flowing full, discharges less than the same pipe when only filled through a segment whose arc is  $281^{\circ}30'$  by 2.5 per cent., while the velocity is less by 9.5 per cent., the hydraulic inclination being the same. The full section discharges less, and also with less velocity, in other forms of pipes as well as in cylindrical ones. The scouring power of circular pipes, flowing full, is therefore less by nearly 10 per cent. than that of the same pipes filled through an arc of  $281^{\circ}30'$ —a new element to be considered in the arguments for and against circular pipe sewers.

#### The Portico of Octavia, Rome.

R. BURGESS.

Near to the theatre of Marcellus stood the famous Portico of Octavia. The first marble building ever erected at Rome was a portico which stood on this self-same site. It was built by Metellus Macedonicus: two temples were comprised within it. The architects were two Spartans, whose names were Sauros and Batrachus. They not only contributed their skill, but, as they were rich men, they employed their wealth also in the undertaking. The only reward for their services which they asked of the Romans was that their names might be mentioned in an inscription on the temples; but this honour being refused, they contrived to introduce their names allegorically. Sauros meaning a lizard and Batrachus a frog, those animals were introduced into the capitals of the columns. The architects of the Portico of Octavia were also Spartans, and they respected the works of their distinguished countrymen. The new portico comprised in its circuit the two temples, made more magnificent and probably much enlarged. The fragment of the Pianta Capitolina, with the mutilated inscription "CVS OCTAVLÆ," gives us the plan of those splendid works. Bellori, in his illustration, computes about 270 columns. The principal remains consist in six large columns of the vestibule or entrance (and who that has seen Rome has not admired the magnitude and elegance of those Corinthian columns), eight more columns of the exterior row of the peristyle, and there are also further remains of one of the temples to be seen in a Vicolo behind the church of St. Angelo: three columns standing at an angle indicate the position of the prostyle of the Temple of Juno; the other was dedicated to Jupiter. In the Temple of Juno was her statue, made by Dionysius and Polyclus, and a Venus by Philiscus of Rhodes. In the corresponding Temple of Jupiter was the much-admired statue of the god, which was equally well executed by those sons of Timarchus. There was a group representing Pan and Olympius wrestling together, the work of Heliodorus, and perhaps the Venus of exquisite beauty which Pliny tells us adorned this portico (the work of Phidias) may be the very Venus de Medici which Santo Bartoli declares was found here in the Pescheria. In a part of the building called the Schola Octaviæ was the famous Cupid of Praxiteles, which called forth the eulogia of Cicero, Strabo, and Pausanias. It is more than probable that several of those statues perished in the fire which took place in the reign of Titus, and still more might be lost in that which happened under Sep. Severus. The paintings which adorned the walls and vaults were not less celebrated. There was the famous work of Artemon representing Hercules ascending from Mount Ceta to Olympus, having put off his mortality with the consent of the gods; there was the painting by Antiphilus, where four figures of satyrs were grouped around the noble Hesiod; and Alexander and Philip, with Minerva,

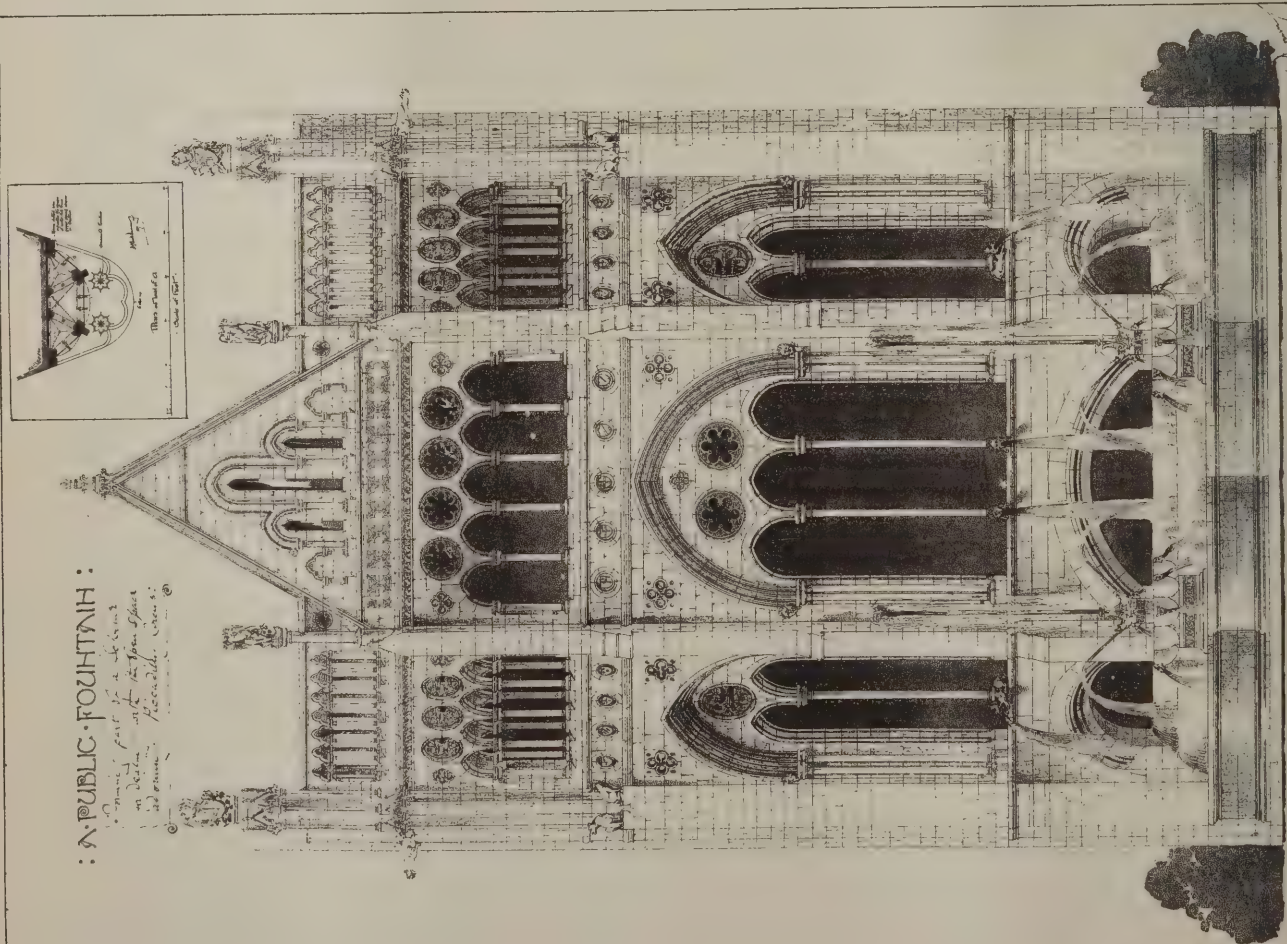






IV. PUBLIC-FOURTH:

1. name of the part of the space  
 2. where the open space  
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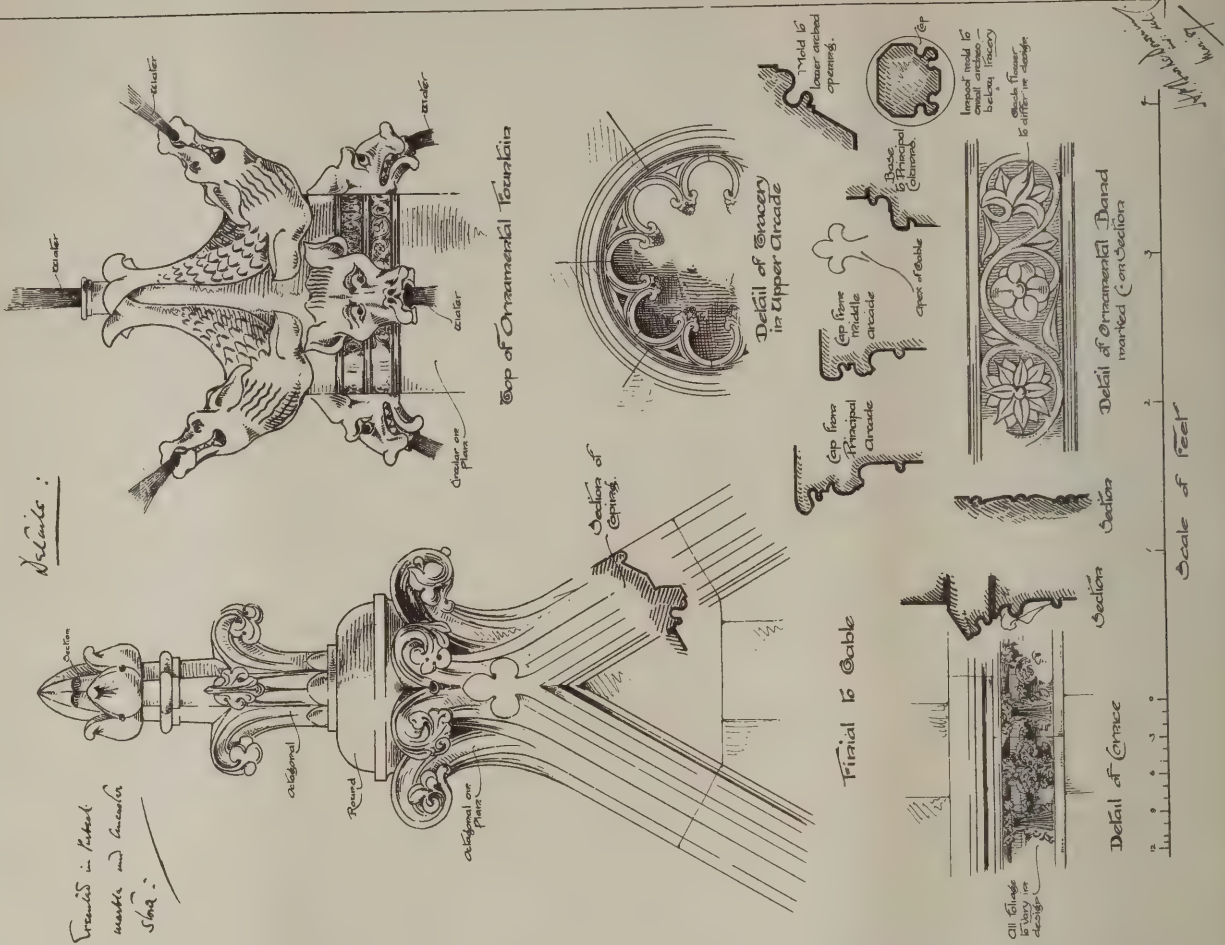
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Y. A. PUBLIC FOUNTAIN:

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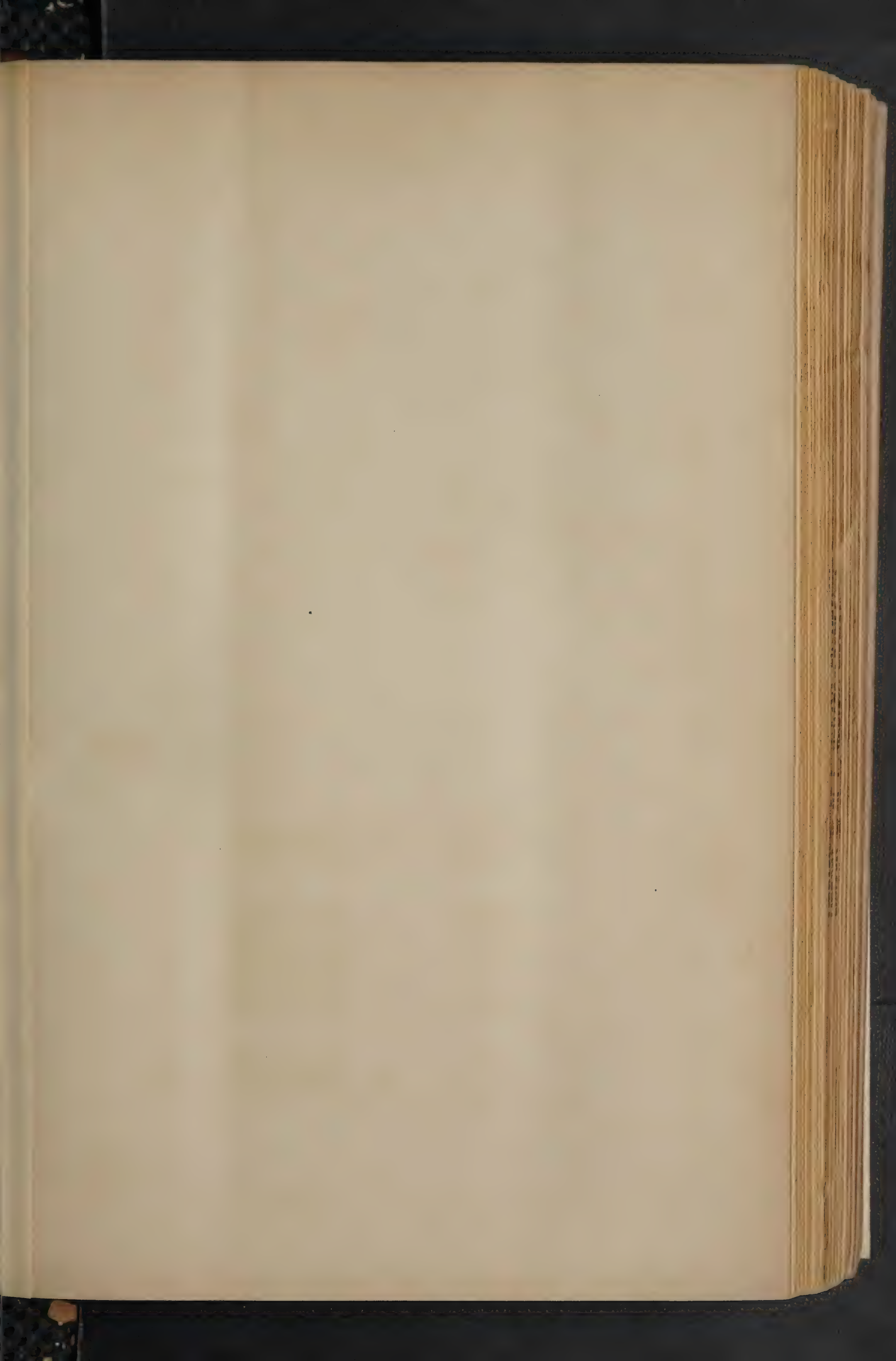
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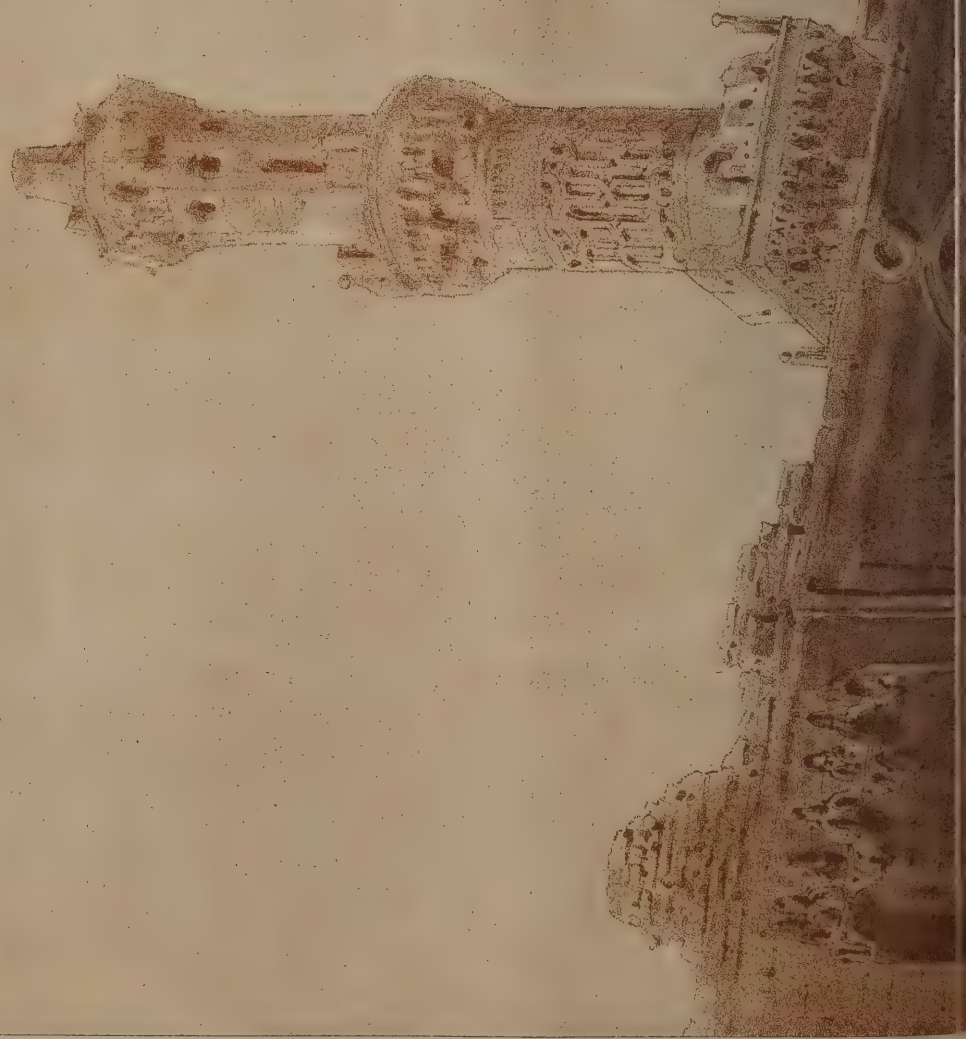
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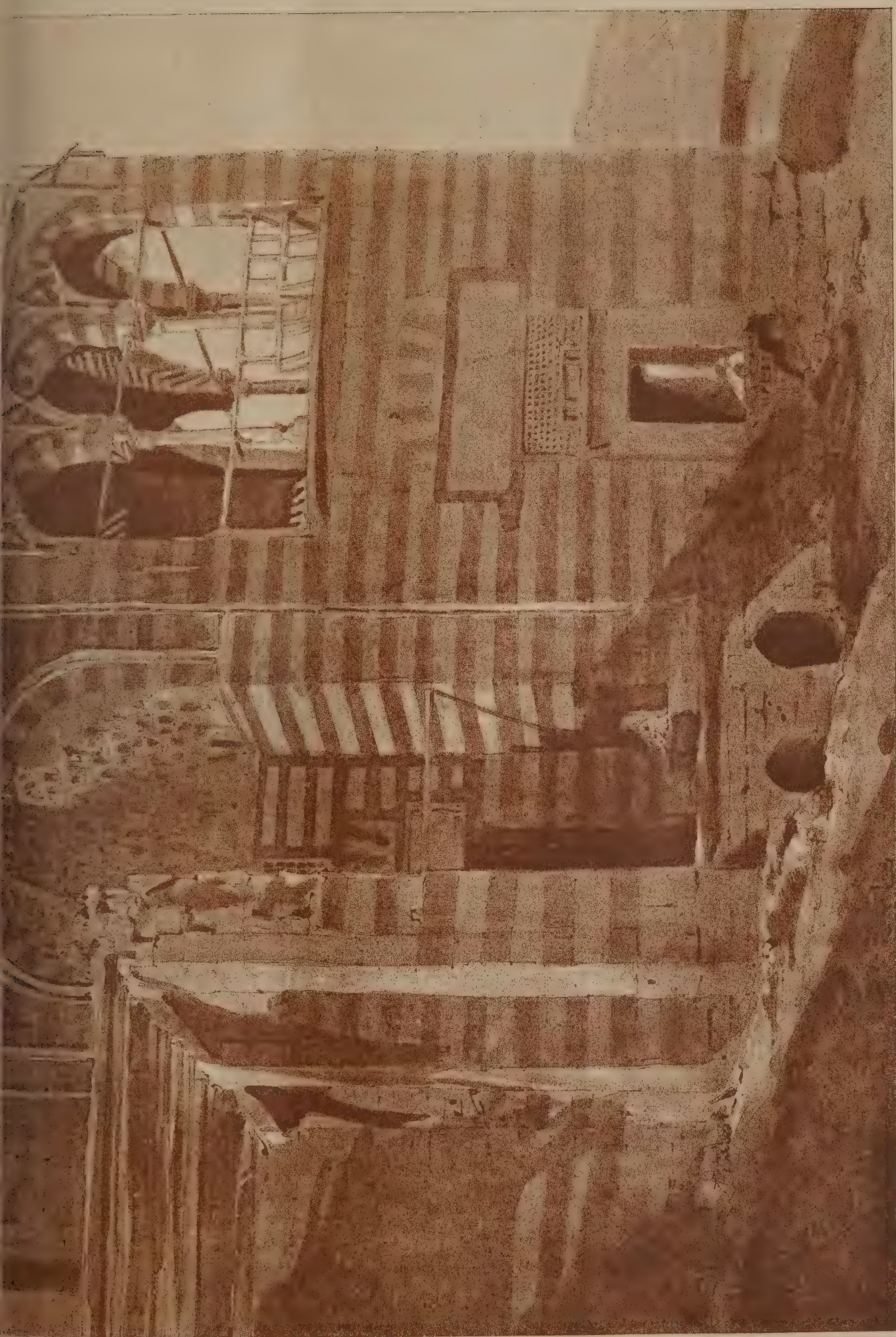




Le Architect. Aug. 24<sup>th</sup> 1888.







R. Phéné Spiers

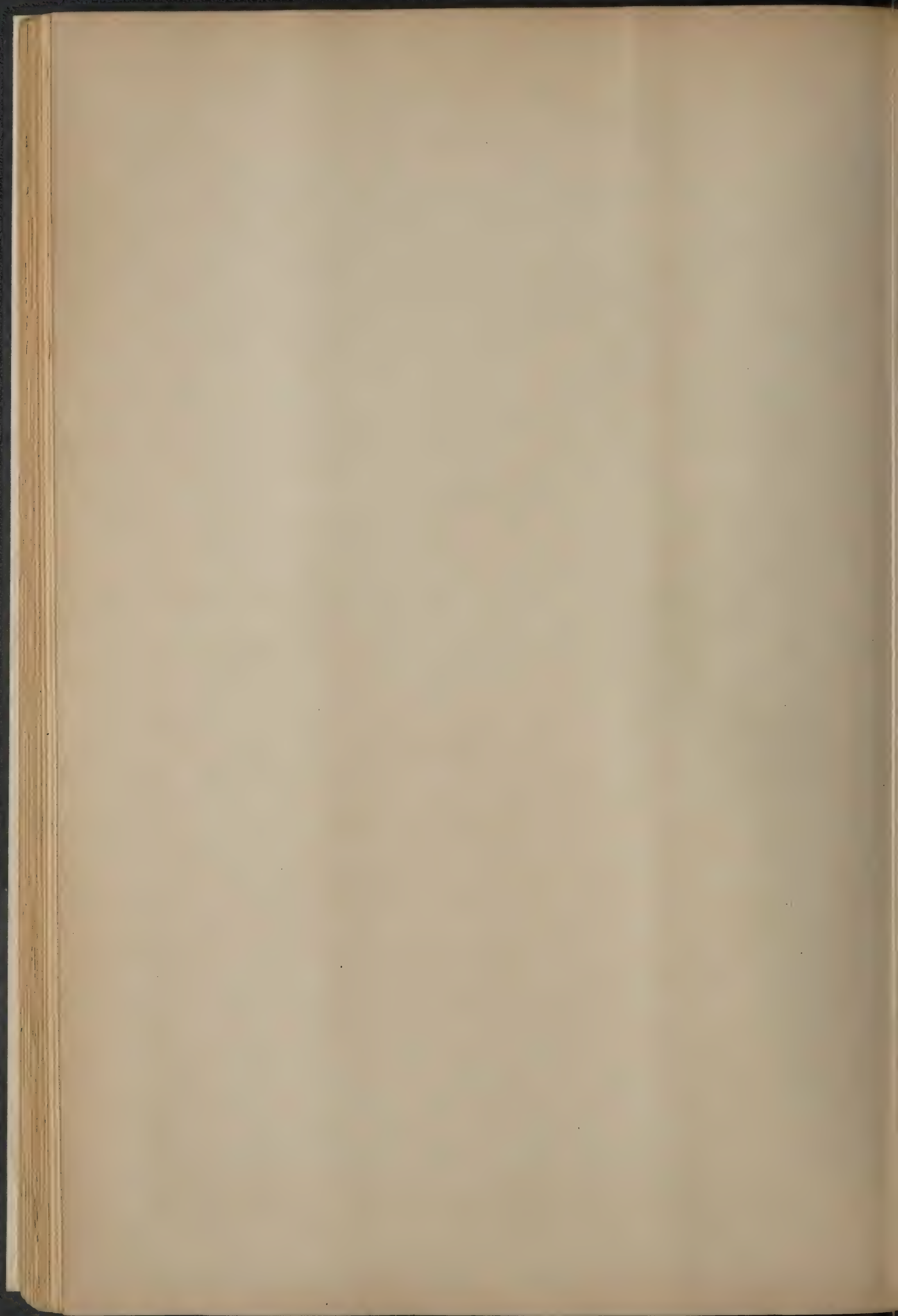
INK PHOTO. SPRAGUE & CO. 22, MARTINS LANE, LONDON, E.C.

# MOSQUE TOMB OF SULTAN BERKOOK, CAIRO.

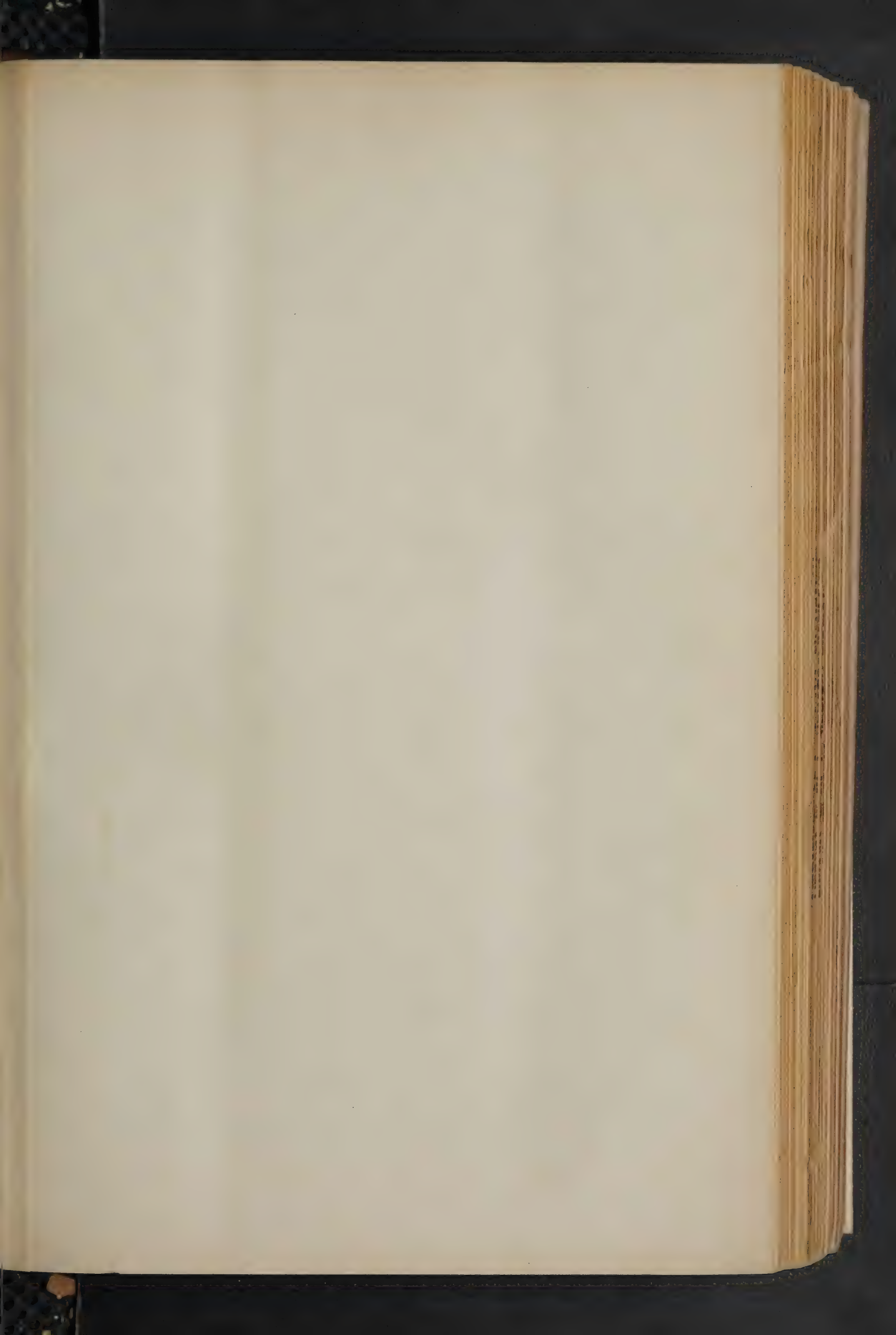
Drawn by R. PHÉNÉ SPIERS.

*The Architectural Illustration Society, 2, Great Street, Fenchurch, E.C. 3.*









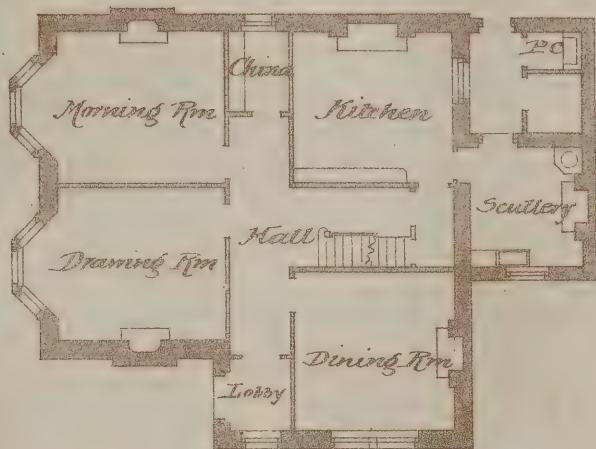




VILLA RESIDENCE  
SYDNEY



4<sup>th</sup> 1888.

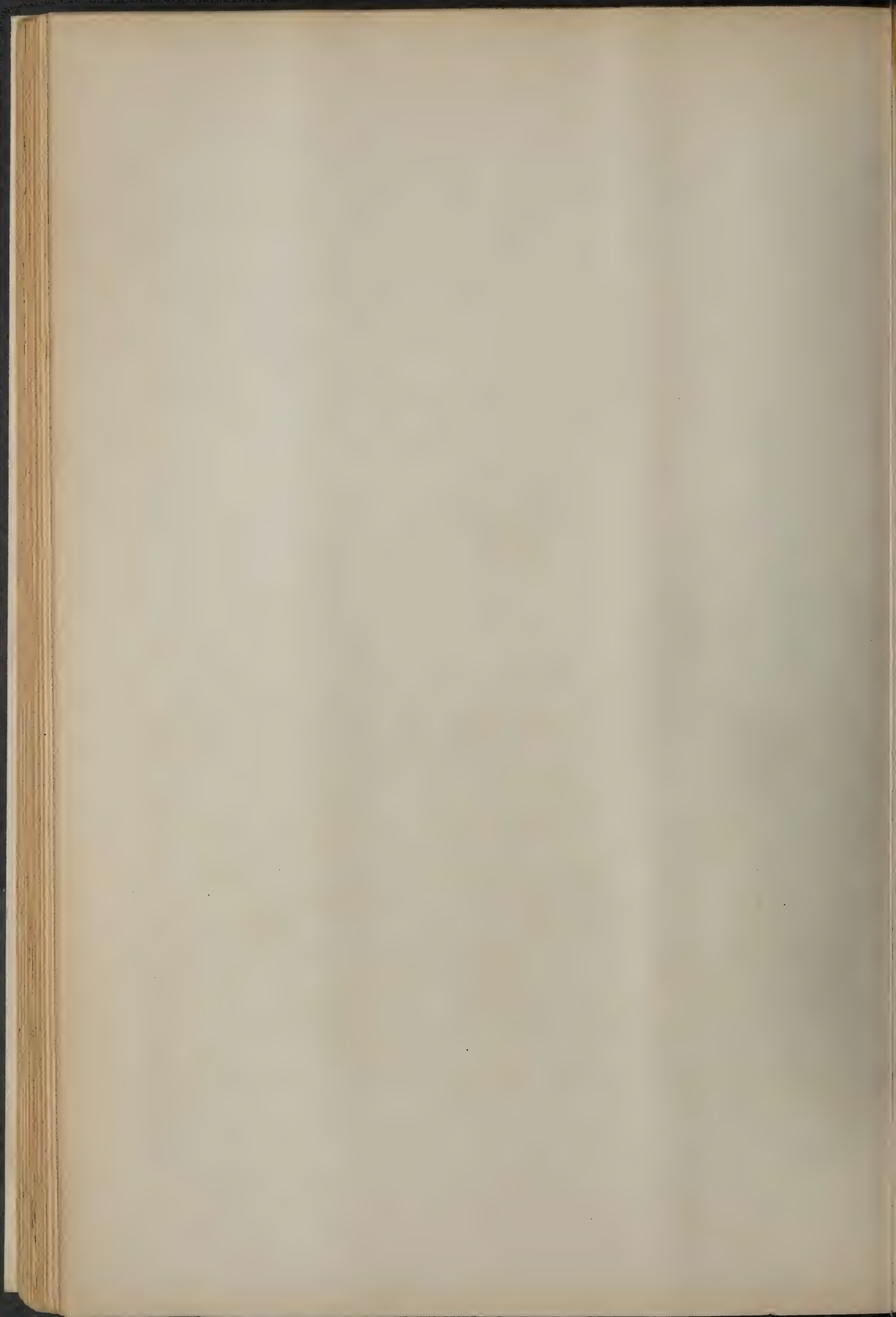


"INK PHOTO" SPRAGUE & CO. 22, MARTIN LANE, CANNON ST. LONDON. E.C.

STON-SUPER-MARE.

E. Architect







The Architect. Aug. 24<sup>th</sup> 1888.



"INK-PHOTO," SPRAGUE & CO., 22, MARTIN LANE, CANNON ST., LONDON, E.C.

JUBILEE FOUNTAIN, READING.  
C. W. WEBB A.R.I.B.A. Architect.







## ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.NO. 13.—MOSQUE TOMB OF SULTAN BERKOOK, CAIRO.  
[R. PHENE SPIERS.]

JUBILEE MEMORIAL FOUNTAIN, ST. MARY'S BUTTS, READING.

THE foundation is of concrete, which is taken down some distance below the road, to allow space for a subway, which is constructed from one side to the other, so that access can be had to any portion of the interior when required. A separate pipe and tap is used for each water supply, and the water can be drawn out of each pipe and basin, and the whole left dry before the commencement of winter to prevent the action of frost. The lower basin is oval, and occupies the whole of the space allowed. The north and south ends are paved with Wycombe paving, and at each of the four corners are red granite guard piers. There are eight granite guard posts with iron railing and gutter, to protect the fountain from being damaged by cattle, &c. The moulded plinth coping, &c., is of solid Portland stone, and at the north and south ends drinking basins are sunk in the coping, and provided with cups and chains. The overflow from the basin is used to supply a stone trough for dogs below. From the centre of the lower basin is raised a block of masonry, the external portion of which is composed of alternate bands of red Mansfield and white Portland stone, the central band having carved ornamentation representing the English rose, and the upper band water lilies in various stages from the bud to the flower. At equal intervals round the central block are eight polished Peterhead red granite columns, with carved capitals, each one being of a different design, the whole supporting a beautifully carved and moulded frieze which forms the second basin. Running round the frieze in bold relief letters is the following inscription:—"Erected to commemorate the fiftieth year of Her Majesty's reign. 1887." Above the inscription is a carved band representing the shamrock and thistle; at equal intervals between each column are eight carved gargoyles or grotesque heads, each one of a different design, and from the mouth of each a flat sheet of water is discharged into the basin below. From the centre of the second basin is raised a small oval block, composed of bands of red Mansfield and Portland stone, surrounded by four small columns of polished granite with carved capitals supporting a solid oval brown Portland stone, which is surrounded by twenty small water jets, each one playing up the stone and falling back over the edge below. This stone is encircled by a band of carving representing the British oak. On the top of the stone is placed a single polished red granite column; this is surmounted by a second capital, on which are two lions back to back, each with a shield, one bearing the Royal Arms and the other the Borough Arms, the side spaces being filled up with carved water lilies, bulrushes, &c. From the centre of the lions rises a white stone carved finial, which is finally surmounted by a beautifully carved crown and coronet, from the centre of which is the top water jet. A strong copper pipe is carried up the centre, so that the wind cannot affect the stability of the upper portion.

The whole has been carried out from the designs and under the superintendence of Mr. G. W. WEBB, A.R.I.B.A., 14 Friar Street, Reading, whose design took the first place in the competition. The contractors were Messrs. WHEELER BROS.

## A PUBLIC FOUNTAIN.

MANY plans have recently been brought forward for dealing with the open space adjoining Piccadilly Circus, but in most cases they have been upon far too extensive a scale to be adopted. The idea in the present scheme is to restore the plan of the former Circus by erecting a valuable block of buildings upon the vacant site, harmonising as far as regards height, but not design, with the existing surrounding buildings, and thus continuing the symmetry of NASH's fine thoroughfare. The ground floor of the buildings it is proposed to treat as a vaulted arcade open to the public.

The fountain we illustrate would be erected against the wall of the building upon the corner piece of ground facing Waterloo Place and Piccadilly. It has been treated in character somewhat similarly to the Fontaine Ste. Michel and the Fontaine Molière at Paris, or to the Fontana di Trevi at Rome—that is to say, having a substantial architectural erection in the background, with water pouring down in volumes from the inside and overflowing from basins at its foot, as indicated upon the plan, this treatment seeming to adapt itself better to such a position than that of a large jet or jets of water as at Trafalgar Square, the ill results of which may be seen upon a windy day, when the effect of the fountain is quite destroyed. There is no doubt that for such a fountain this would be one of the finest as well as most conspicuous sites in London.

The design is by Mr. H. P. BURKE-DOWNING, architect, of 26 Craven Street, Charing Cross.

## VILLA RESIDENCES AT WESTON-SUPER-MARE.

OUR illustration represents one portion of a row of semi-detached houses recently erected in the Beaconsfield Road, Weston-super-Mare, and may be considered a fair average type (of the class) of the prevailing villa architecture of this fast-growing town. With regard to the architectural treatment, although the style adopted for each block varies, the main outlines and features are similar, producing a pleasing variety as well as an harmonious effect. The whole were erected by Mr. CHARLES ADDICOTT, builder, of Weston-super-Mare, from the designs of Mr. SYDNEY JOHN WILDE, architect, of the same town.

## THE LATE MR. JOHN M'LEAN.

THE death of Mr. John M'Lean, architect, of Stirling, took place last week. Originally a mason, Mr. M'Lean had the charge, under the late Mr. Rothead, architect, of the construction of the National Wallace Monument on the Abbey Craig, a work which he satisfactorily completed. He was afterwards appointed Master of Works for the burgh, and in this capacity he designed and partly carried out the feuing of the Hospital lands, the drainage and blocking of the streets, and other improvements. Latterly he devoted his whole attention to his work as an architect, and the result is to be seen in the numerous villas in the West End, the Stirling Arcade and Town Hall, Coathill House, and many other buildings, public and private, in the town and surrounding district. Mr. M'Lean, who was about fifty years of age, leaves a widow and grown-up family.

## ANTIQUITY OF CIRCEUM.

IN the course of a letter, the Roman correspondent of the *Times*, writing from St. Felice Circeo (Island of Oea), says:—

That the peninsula which now ends in Monte Circeo and is unmistakably identified with the Oea of Homer, was once an island is demonstrable by geological evidence, and of its being inhabited in the earliest stages of civilisation there is proof. A grotto on the sea side of the mountain, known as the Grotto of the Goats, shows perforation of the pholas in great abundance at an elevation of 30 or 40 feet above the surface of the sea; and this elevation is greater than the level of the Pontine marshes, which intervene between the Circean Cape and the semicircle which lies beyond the marshes and limits them. A subsidence of half the height of the band of pholas work from the sea level would bring the sea over the entire plain, and make Oea again an isle, and perhaps restore a part of its enchantments.

It is clear from the history of the early Roman wars with the tribes which inhabited the low-lying Volscian country, that the entire section now occupied by the Pontine marshes and once covered by the sea, was at that date firm and inhabitable land. The earliest political history we have shows that it was, when that history was made, in that condition, and justifies the conclusion that it is now really subsiding, and that therefore the reclaiming of the district is at best a very uncertain undertaking, an economical result which I offer *en passant* to the Royal Commission for the drainage of the Pontine marshes; but my use of the fact is to point out that the Homeric knowledge of Oea must have been far more ancient than anything we generally connect with the era of the "Odyssey." If 700 years before the Christian era the Ager Pomptinus was good land, fit to fight over, and for long after one of the great sources of the



grain supply of Rome, how many years must have elapsed since it was covered by the Tyrrhenian sea? I ask, not to get an answer, but to point out the immense antiquity of the Homeric tradition of the Island of Circe.

What we know by early Latin tradition of sufficient authority is that there was here a city called Circeum, which practically retained its civic existence until the Social war, but of the site of which there has been much dispute. There need have been none, for the prehistoric record is much clearer than the geological to one who knows how to read it. A diligent search into the stonework, which is the only sure evidence in the centuries preceding the introduction of letters, shows that the modern town from which I date this letter is built on an angle of the Pelasgic city, and the further and complete investigation discovers one of the most interesting of the enormous series of early Italian (Pelasgic) cities. The Roman city was on the same site, as is shown by superstructures of Imperial masonry, and the town was an important possession of the Caetani during the period of the contests of that family with the Popes, but was utterly destroyed at some time prior to the sixteenth century; for we find in the record the permission given to reconstruct it about 1550; and that the reconstruction was complete is evident from the character and absolute similarity of all the houses, not a trace of anything older than the sixteenth century occurring anywhere.

But, the exterior houses of the town being so arranged as to form a wall of defence, we find that the foundations are laid for three sides on a Pelasgic wall of the earliest type, and that the wall on the north and south formed one of the most stupendous city enclosures I have yet found in Italy. The ancient city was built on a plateau about 400 feet above the sea, irregular in form, and following the outline of the level land on the east, north, and south-east, and then, by a gentle elevation for about a furlong, rising towards the mountain which dominates it and up the mountain side until it meets the foot of a precipice, on the summit of which, at a height, as well as I could estimate, of 1,200 feet, is a citadel of the most admirable polygonal construction, of which one angle still measures 20 feet in height. One of the gates, or, I am inclined to think, the only gate, is still in tolerable condition, and in construction resembles the sally-port of Mycenæ. The total circuit of the original wall must have been about two miles, and near the shore are the remains of two towers, apparently intended for the protection of the port, and opposite them is, in fact, a basin whose bottom is now nearly 20 feet above the sea level, so regular in form that it may well have been artificial, the shoreline of those days, when it could have served, being bold and rocky, not at all adapted to the hauling ashore of ships.

Nothing can give a better idea of the relative density of the population of ancient and modern Italy than the comparison of the ruins of these Pelasgic cities with their modern substitutes. The modern city of Palestine is built on the terraces of the Temple of Fortune, and the village of St. Felice Circeo is included in the space between two angles of the old wall, the narrowest face of the polygon it formed, and covering only a fraction—at a guess I should say the thirtieth part—of the rising land on which the ancient city was built, and excluding the steep mountain-side, where the wall was merely a completion of the defence and a curtain to secure the communication with the citadel above, which completed the circuit. And there are, I am told by Fontanarive, who has made special investigations into this class of ruins, 400 places in the part of Italy which may be called Pelasgic, which indicate the existence at some time of cities of that epoch to which belong also the ruins of Tiryns, Mycenæ, and many unnamed and forgotten cities of the Greek islands and coasts. The magnitude of the works here indicates a large population and a highly-organised labour, for in the best work the stones are fitted with the utmost precision by hammering alone, and in these ruins of Circeum there are blocks 10 feet in length, fixed in their places on a steep mountain-side, where to place them without modern machinery would task the powers of modern man. And what the social and civic condition of the place was the enormous strength and the propinquity of these great fortifications indicate. If the defence is formidable, so must the attack have been, and we may construct the society of the Pelasgic epoch as one in which every city was at war with every other, and in which war was carried on with energy and organisation such as we have but a feeble conception of.

Another result not without interest in this connection and having regard to recent discussions is the conclusion, now adopted by all the Italian authorities on this subject, and of which we get here unusual affirmation in these ruins, that the citizen of the archaic city lived in wooden houses or in tents of skins or cloth. I have examined many of the ruins of this class, and only in one case have I found any indications of interior construction, and these, in one of the least elaborate—the ruin on Aetos in Ithaca—were evidently intended for treasures, the walls of the compartments having the solidity of the walls of the city. That the houses of the archaic period were of wood is, moreover, indicated by the Doric Temple,

which is based on the construction of the timber house transferred to stone and the hut urns in the early Italian graves, which were doubtless the commemoration of the residence of the deceased while he was still among the living.

The extreme antiquity of Circeum, shown in the style of the earlier work, or it may be the more hurried, gives a peculiar value to the technical indications, owing to the climate being extremely favourable to the integrity of the worked surfaces of the stone, and the unusual elaborateness of the works gives an archaeological value to the site which very few archaic Italian cities possess. In Terracina, ten miles away, we have, in the cuttings for the Appian way, of the original work of Appius Claudius, the surfaces showing the chisel marks almost perfect, so that we have every right to assume that those at Circeum have with an unusual fidelity preserved the testimony of the ages as to the condition of the arts at the day when they were built. The lichenous grey which marks the original surfaces of the hardest limestone here, and which has not yet returned to the Appian cuttings, so that they look like new surface still, compared with the natural cliffs, has everywhere come back to these Pelasgic walls, but the resumption of nature has gone no further. What a suggestion of antiquity!

### ST. MARY'S CHURCH, WARWICK.

THE members of the Royal Archaeological Institute made an excursion to Warwick during their congress, where St. Mary's Church was visited and the Rev. Mr. Case, in the absence of the vicar, read a paper describing the church from an historical and architectural point of view. The church existed, he said, prior to the Conquest, though there was no record of the date of its actual foundation. He traced the history of the church, noting the work of rebuilding the choir, begun in 1367 by the Earl of Warwick, Thomas Beauchamp, till it was dissolved under Henry VIII. and, after being shorn and clipped, the fabric was conveyed by the Commissioners to the inhabitants of Warwick. In the fire at Warwick, in 1694, the tower, nave and transept of St. Mary's were destroyed. Subscriptions were immediately set on foot, and commissioners were appointed by the Crown to superintend and direct the rebuilding of the church. At one time there was an idea of placing the work in the hands of Sir Christopher Wren. This was, for some reason, abandoned, and Sir William Wilson was appointed to erect the new building, and to him must be assigned the incongruity of the present structure. He also rebuilt Four Oaks Hall and Nottingham Castle.

In describing the church, said Mr. Case, the first part to which I shall direct your attention is the tower. It consists of three stages in height, in the lowest of which four very massive piers support arches of a pointed form. Above each of these arches is a pointed arch of blank panel work, divided by a shaft of clustered reeds, with a capital formed of the acanthus leaf. In this are two small perforated lights, and on each side two semicircular niches of semi-classic design, with projecting brackets at the base. This stage is divided by a cornice supporting a balustrade, and adjoins the roof of the church. Immediately above this balustrade, on the north, west, and south sides, are tablets, recording the erection and rebuilding of the church. The second stage is similar to that below, with pointed arch panelwork and semicircular niches; the division between it and the stage above is worked with a horizontal cornice moulding. The third stage of the tower contains on each side four pointed single-light windows, two immediately above the other two; these have on each side two niches at the top. There is a cornice above and blocking course, on the face of which are shields (twelve in number), with the armorial bearings of the families that have held the Earldom of Warwick. The whole is crowned by a parapet with large square crocketed pinnacles at each angle, and a smaller pinnacle rising from the middle of the parapet. The composition is partly Classic, partly Gothic. Though the tower is faulty in detail it is very striking in appearance, and a conspicuous landmark. As stated in the inscription, the old tower with the nave and transepts was burnt down in 1691. The new tower was twice rebuilt; the first tower, which was deemed unsafe, was 98 feet high, the second and present tower is 166 feet high. The windows are eight in number, piercing the north and south walls of the aisles and transepts. They are said to be miserably designed: each has six semicircular-headed lights; the head of each window is filled by a huge light of a horse-collar form. In the spaces between the windows there are buttresses of meagre design. A horizontal cornice runs along the top above the windows, and an open balustrade parapet, with stone urns at intervals. The gable front of each transept is surmounted by an urn, the symbols of Paganism taking the place of the Christian emblem, the cross. Entering the church, we see that the nave is divided from the aisles and transepts by four arches, pointed in form, and supported by piers. The roof is arched and ceiled, and each bay is



divided into eight compartments by small plaster ribs, and at the intersection of the ribs is an escutcheon surrounded by scrollwork. The transepts are shallow in proportion, and consist of only one bay of vaulting in addition to the bay of the breadth of the aisles. In the old nave there were many interesting monuments of the deans and secular canons of this church, and the burgesses of the town, which were completely destroyed by the fire which consumed the nave. It appears that there was one chantry attached to the church, which had an altar dedicated to St. Anne. It was founded by Sir Robert Walden, 2 Henry IV. The chantry is supposed to have been the present lobby.

The oldest part of the church, that which remains of the time of Roger de Newbury, is the crypt under the choir. It is divided into two parts by four piers, each part containing five bays of vaulting. The three westernmost piers, with the three bays of vaulting, exhibit Norman architecture of the early part of the twelfth century. The fourth and easternmost pier is a plain but massive octagonal pier, in the Decorated style of the fourteenth century, with a moulded capital. This and the two easternmost bays of vaulting are the work of Thomas Beauchamp, who died 1369. The crypt appears to have been lighted by five windows, of which only one in the easternmost bay remains perfect; the others have been partially filled up. That portion of the crypt lying below the vestry is now a burial vault for the Earls of Warwick, converted to that purpose about 1770. The choir is said to have been finished by the second Thomas Beauchamp, A.D. 1392. But Mr. Bloxam thinks from the depressed four-centred arch of the large east window, and the panelwork with which the east wall of the choir is covered, that alterations must have been made by Richard Beauchamp, Earl of Warwick, who founded the chapel of Our Lady. The monument in the centre of the choir is that of Thomas Beauchamp, the second of that family. Thomas (his second son), who succeeded him, finished the choir begun by his father, and newly built from the ground the whole body of the church.

The lady chapel, commonly called the Beauchamp Chapel, from the founder, is one of the richest of the structures erected as mortuary chapels during the fifteenth century. It has suffered much from desecration. On June 14, 1642, a band, under Colonel Purefoy, entered the chapel and defaced its monuments. The altar with its decorations was, it is supposed, then broken down. The present altar-piece, representing the Annunciation of the Blessed Virgin, was the work of Collins, a stonemason in Warwick, and erected in 1735. This chapel was founded by Richard Beauchamp, Earl of Warwick. The chapel took twenty-one years in building, being finished in 3 Edward IV., 1464. On the south side is a small wooden piscina, a very rare and curious example of that feature. A flight of well-worn steps leads to some perforated wooden panelwork, and to a small aperture through which the elevation of the Host at high mass might be seen. This little chapel may have been constructed for the performance of low mass by a single priest in commemoration of the founder of the chapel. The four barred helmets were originally part of the funeral achievements fastened over the monuments in this chapel; one of these is supposed to have belonged to the Marquis of Northampton, who was buried in the choir of the church.

#### STRATA FLORIDA ABBEY.\*

SINCE the meeting last year at Denbigh, when Mr. Williams said he had read a paper on this subject, the further excavation of the site of the Cistercian Abbey Church of Strata Florida had been carried out under his direction. The committee of the Cambrian Archaeological Association determined to recommence the work of excavating the site of the abbey church in May last. At that time the funds subscribed for the purpose only amounted to 90%, but during the progress of the works subscriptions had been received and promised raising the amount available for clearing the site of the church, sacristy, chapter-house, and part of the cloister to 145%. On May 24 last the works were recommenced, and a staff of men had been employed continuously up to the 4th inst., when, the whole of the funds being exhausted, it was considered desirable to suspend operations.

The whole of the site over which they had permission to excavate was within the churchyard of the parish of Strata Florida, a very extensive churchyard, but, fortunately, no modern burials had taken place in that portion of it occupied by the ruins or immediately surrounding them. Externally the north wall of the north transept had been cleared, also the east and south wall of the presbytery, the east wall of the chapels on the south transept, and the sacristy and chapter-house, disclosing the freestone plinths and

\* From a paper read by Mr. Stephen W. Williams, F.R.I.B.A., of Rhayader, at the meeting of the Cambrian Archaeological Association at Cowbridge.

magnificent buttresses. A portion also of the south wall of the nave had been cleared in the cloisters, enabling them to find the south-east door of the nave, with its very beautifully moulded jambs, perfect for a height of nearly four feet. One jamb was also discovered of the south-western doorway of the nave, opening into the western alley of the cloisters, and at the north-west angle of the nave the base of the angle buttress had also been found. The outer walls of the nave did not appear to have had buttresses corresponding with the responds of the piers in the aisles. The excavation of the external face of the walls of this portion of the church had disclosed the fact that buttresses were built to take the thrust of the groining and arches at every point, and that the greatest care was taken to build them solidly and well. Following the line of external excavation, they came to the north transept, the whole external face of which had been cleared down to the original ground level, and it had enabled them to find the plinths of the square buttresses, of Norman type, and the elaborate moulding of the north door. The external wall of the west end of the presbytery, like the north face of the north transept, had been cleared down to the original ground level, and there were, in addition to the angle buttresses, square pilasters carried up between the centre and side lights of the east window, which was a triplet; and these pilasters, like the buttresses, were of ashlar work. Externally, on the eastern side of the south transept had been found a series of monks' graves, some of which have still their carved headstones *in situ*. Continuing the excavation along the face of the eastern wall of the south transept, they discovered still *in situ* the window of the sacristy. Beyond this there was a change in the character of the walls, the workmanship being inferior. The chapter-house had the foundation still remaining of the stone bench upon which the monks sat in conclave, and masses of the entrance doorway had been found, consisting of arch moulds, bases, and capitals, and a portion of the base mould of one side of the door still *in situ*. The character of the mouldings found were clearly of later date than the church, and were of Early English type, whilst all the work in the church itself was distinctly Transitional or late Norman.

Returning to the interior of the church, and commencing at the west end of the nave, one of the most important and interesting facts discovered was the finding of the western respond of the south arcade *in situ* for a height of 10 feet above the floor level of the nave. He believed he might venture to say that at Strata Florida they had found a most unique and peculiar type of arcade. Alterations had been made in the shape of the piers subsequent to the great fire, and he found that fragments of moulded work had been used as quoins in repairing the damage caused by the burning of the abbey church in 1284. Originally, all the piers were of oblong plan, but had been altered at some later period, probably after the fire. In the course of his concluding remarks Mr. Williams said he had recovered singularly beautiful tile pavements, in which were the dragon of Wales, a griffin, the arms of the De Spencers, &c., in patterns that were unique. He believed he had discovered probably the finest series of tile pavements ever seen in any ruined abbey in England and Wales. He then went on to speak of the elaborateness of the carving throughout, and asked, Who were the workmen? Was there a school of native workmen? Finally, he asked for further funds to carry on the good work of discovery.

#### OLD GLASGOW.

TILL the present century was considerably advanced, the civil, judicial, and penal functions of the municipality of the western burgh, like those of most other centres of the same kind throughout the country, were conducted under one roof. It was only under pressure which could not be resisted that the Town Council came to the decision that city affairs pure and simple should be carried on in premises specially dedicated to this purpose. Mention was made of a "Tolbuyth," the *Scotsman* says, as far back as 1454, the year in which there was reference to John Stewart as the "first provost that was in the city of Glasgow." It was situated at the north-east corner of Trongate and High Street, and it rested upon a piazza, within which, on the street level, were booths occupied by the leading shopkeepers for the manipulation and sale of their wares. The rents derived from those places were applied to the maintenance of the Council hall and prison cells, and "to na uther use." Archaeologists have been forced to the conclusion expressed by Mr. Andrew Macgeorge in "Old Glasgow"—"We have no account of its appearance, or when it was erected." In consequence, largely, of "the mercantile genius of the people," which Thomas Tucker, one of the Scottish Commissioners of the Commonwealth, observed during his residence in what he was then pleased to praise as "a very neate burgh town, consisting of foure streets handsomely built in form of a crosse," the old structure became inadequate



for the requirements of the city. The Corporation in 1625, when James Inglis was Provost, "all in ane voice hes concludit" that a new Tolbooth "sall be buildit with diligens" in the same locality. Diligence was indeed manifested in the operations, for in the following year the minutes adverted to the finishing of "the steppill head," which is still one of the architectural features of the central district of the western city. It was within this "legal fortress" that Sir Walter Scott laid a well-known scene in his "Rob Roy." Sir William Brereton, in 1634, observed that the "structure is said to be the fairest in this kingdom;" while Franck, another English visitor, in 1658 remarked that it is "a very sumptuous, regulated, uniform fabrick, large and lofty, most industriously and artificially carved from the very foundation to the superstructure, to the great admiration of strangers and travellers." For nearly two centuries the work of the city was concentrated in this erection. Of the accommodation a considerable portion was required for lock-up purposes, and a special allowance was made to the gaoler for keeping "warlocks and witches," while public executions took place in front of the building. The civic authorities in 1736 added a Town Hall immediately to the west of the Council Chambers and communicating with them. It was a handsome apartment with a coved roof, and it was decorated with paintings and sculpture. On various occasions important gatherings took place within its walls. The receipt of the intelligence that, according to the Jacobite lament, "The die was risked and foully cast upon Culloden day," produced quite another strain within its precincts. For the Provost and his fellow members of the Town Council, and the principal and professors of the University, with other leading citizens, met there to rejoice over the decisive result of the battle. The final event in its history was a corporation dinner at the inauguration, in 1854, of the equestrian statue of the Queen, provided by public subscription, as a memorial of Her Majesty's visit in 1849. Intact till 1874, it was then incorporated by the City Improvement Trust with the Tontine Building, now one of those large drapery warehouses forming a feature of the city.

It became evident early in the present century that the Tolbooth had ceased to be adequate for the wants of the city. The result was that the first portion of Bridewell was built in Duke Street, where there is still a prison for persons incarcerated for short periods. Of course this relieved the pressure of the old place of confinement, but it left the Council Chambers and Court-rooms in as unsatisfactory a state as before. During the two years from 1807 to 1809 the subject of new buildings was gravely canvassed; and in the latter year it was resolved to have these on the Laigh Green at the foot of the Salt Market. Plans by Mr. William Stark, Edinburgh, were approved in 1810; and the structure was estimated to cost 20,000*l.*, but the contracts amounted to 22,000*l.*, while the actual outlay was 34,811*l.* The members of the committee in floating the scheme expressed "their conviction of how salutary, how comfortable, and how beneficent in every point of view a new gaol, Court-house, and other offices must necessarily be, and how ornamental such a building must prove to this populous, increasing and flourishing portion of the Empire." The foundation-stone was laid by Lord Provost Black, and by-and-by the fine pile which stands in Jail Square, opposite the western entrance to the Green, was ready for use. It is now almost entirely employed for Court-house purposes, the High Court and the Sheriff Courts holding diets there; but it is occasionally utilised in other ways, the recent Boundaries Commission having had it for its meeting place. On the erection several alterations were lately carried into effect, and under a special Act one half of the cost of the improvements was borne by the Government, which also defrays the expense of maintenance. The place had only been occupied a few years when it was ascertained that another shift would have to be made, and a battle of sites raged somewhat fiercely for a time. One influential party was anxious to convert St. George's Church into municipal buildings, and another to have the seat of local government returned to the neighbourhood of the Cross. In the end a compromise was effected, and, under an Act passed in 1836, a new edifice for the accommodation of the municipal authorities and of the Sheriffs and Justices of the Peace was agreed upon on a site between the two points mentioned. Once more the design for the buildings, which with the site cost 54,000*l.*, came from Edinburgh, the architects chosen being Messrs. Clarke & Bell, a young firm which, in consequence of this success, removed from the east to the west country. Operations were begun under the superintendence of the members of the firm, and the foundation-stone was laid with considerable pomp by Lord Provost Campbell. The front elevation to Wilson Street of these buildings, which, like their predecessors, are now almost entirely given over to Court-house purposes, is exceedingly handsome, and the façades to Hutchison and Brunswick Streets are also very fine. For thirty years the municipal officials occupied the west side of the block, and the Sheriffs the east one, but the growth of the city by-and-by told upon both the departments, and yet

another change became inevitable. In passing notice may be taken of the fact that Sheriff Alison, the historian, and Sheriff Glassford Bell, the poet, were among those who occupied the bench in the buildings. It was ultimately agreed that the municipal should leave the legal authorities in full possession of the original structure. The question of site again occupied the attention of the public, and one section of the citizens, headed by Lord Provost Rae-Arthur, advocated the acquisition of the ground on the east side of George Square, now secured, with the view of providing offices for all the municipal departments, while another urged the appropriation of the remaining ground between Wilson and Ingram Streets. On the matter being referred to the Town Council, the vote was in favour of the latter project, and after a good deal of trouble the buildings were altered, in accordance with plans prepared by Messrs. Clarke & Bell, while in 1874 they were available for occupancy. Hardly were the officials settled in their new quarters when it became obvious that the action taken could only be regarded as a temporary expedient to be followed by a larger scheme. Lord Provost Bain revived the George Square scheme in 1877, when it met with general approbation, an Act in favour of it being passed without opposition in the following year. The purchase of the property was at once carried out with comparatively few wrangles, and the price paid for it, including law and other charges, was, in round figures, 173,000*l.*

#### FERNIHERST CASTLE.

WORKS for the preservation of the fine old baronial castle of Ferniherst, an ancient seat of the Kerrs, situated on a high bank of the Jed, about two miles from Jedburgh, have been undertaken by the Marquis of Lothian. The walls, both outside and inside, have been cared for, and a strong buttress has been erected at the back of the castle to support what was considered to be a somewhat weak part of the building. This buttress has a moulded vase—copied from the north transept of Jedburgh Abbey of the fourteenth or beginning of the fifteenth century—and is surmounted by a tower similar in design to the bartisans at the corners of the keep, but of somewhat larger dimensions than these. The old kitchen, with its enormous fireplace, has had its barrel-vaulted roof covered with cement, so as to prevent water percolating down through the masonry. The outward appearance of the upper storey of the keep has been much improved by the restoration of two dormer windows which had disappeared, and which were restored from an old engraving. In the interior, however, the greatest change is observable. Originally there were three floors, but these were in so unsafe a state that they had to be removed, and instead of putting in three as formerly, there are now only two, with a balcony underneath, which passes along two sides of the building. The upper room, as well as the bartisans, has been lined with yellow pine, and the arched roof has been treated in the same manner. An ogee moulding runs round the room at the wall-heads. The joists which support the upper floor are also of yellow pine; but those of the floor below are of oak. The balcony under these is of the same material, and the balusters are of old-fashioned design. The staircase leading from the entrance to the first landing is broad, while those of the storeys above are narrow and of a spiral character. The broad stair has been restored, the steps being of a darkish red sandstone, and having a moulding similar to the original. A great improvement has been effected on the gateway which led from the inner to the outer court on the side next to the Jed. This gateway, which is surmounted by the arms of Andrew, Lord Jedburgh, was much dilapidated, but has now been restored to its original character. The mouldings on one of the jambs were entire, but from the other a number of moulded stones had disappeared. These have now been filled anew, and the arch strengthened. The outer court wall has long since been levelled with the ground, but the workmen came upon the foundation while cutting a drain down towards the bank. While making an opening in one of the walls of the keep an old staircase was discovered, but was built up again. This led, it was supposed, to one of the vaults. The other and larger portion of the castle buildings is still used as a dwelling-house, and has been tenanted for many years by Colonel Paton. Ferniherst Castle is of considerable historical interest, not only because it was for several centuries the home of the Kerrs, but also for the scenes it witnessed during the Border wars. It was taken by the English under Lord Dacre in 1523, immediately after the storming of Jedburgh by the Earl of Surrey, and retaken on behalf of the famous David Kerr by a body of French soldiers under command of Monsieur Desse. It afforded an asylum to the fugitive Earl of Westmoreland in 1569, and in revenge for this the Earl of Sussex laid the castle in ruins the following year. It must, however, have been speedily repaired, as we are told that in 1571 the Earl of Ruthven "destroyit the biggings of Ferniherst, the corners, and all that he could be master of."



## Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

### RESTRAINTS ON THE GROWTH OF LONDON.

A CURIOUS collection could be made of the complaints by men who supposed they were patriots against the growing of the metropolis. On first sight it may appear better to live in a house in the country or in a country town, but London could not have attained its present size if a large number of people had not discovered that it was better to live there than elsewhere. It is as futile to put a restraint upon the speculators and the builders' work as to adopt the Partingtonian system of keeping out the Atlantic. The following paper by Isaac Disraeli will suggest the vain endeavours of Governments to oppose a social tendency which has attained the power of a law of nature, but after all, the attempts to put down building and keep London from going beyond its ancient boundaries is in keeping with many other foolish deeds which are now revered as the wisdom of our ancestors.

Recently more than one of our learned judges from the bench perhaps astonished their auditors by impressing them with an old-fashioned notion of residing more on their estates than the fashionable modes of life, and the *esprit de société*, now overpowering all other *esprit*, will ever admit. These opinions excited my attention to this curious circumstance in the history of our manners—the great anxiety of our Government, from the days of Elizabeth till much later than those of Charles II., to preserve the kingdom from the evils of an overgrown metropolis. The people themselves indeed participated in the same alarm at the growth of the city; while, however, they themselves were perpetuating the grievance which they complained of.

It is amusing to observe, that although the Government was frequently employing even their most forcible acts to restrict the limits of the metropolis, the suburbs were gradually incorporating with the city, and Westminster at length united itself to London. Since that happy marriage their fertile progenies have so blended together, that little Londons are no longer distinguishable from the ancient parent; we have succeeded in spreading the capital into a county, and have verified the prediction of James I., that "England will shortly be London, and London England."

"I think it a great object," said Justice Best, in delivering his sentiments in favour of the Game Laws, "that gentlemen should have a temptation to reside in the country, amongst their neighbours and tenantry, whose interests must be materially advanced by such a circumstance. The links of society are thereby better preserved and the mutual advantages and dependence of the higher and lower classes on one another are better maintained. The baneful effects of our present system we have lately seen in a neighbouring county, and an ingenious French writer has lately shown the ill consequences of it on the Continent."

These sentiments of a luminary of the law afford some reason of policy for the dread which our Government long entertained on account of the perpetual growth of the metropolis; the nation, like an hypochondriac, was ludicrously terrified that their head was too monstrous for their body, and that it drew all the moisture of life from the middle and the extremities. Proclamations warned and exhorted; but the very interference of a royal prohibition seemed to render the crowded city more charming. In vain the Statute against new buildings was passed by Elizabeth; in vain during the reigns of James I. and both the Charleses, we find proclamations continually issuing to forbid new erections.

James was apt to throw out his opinions in these frequent addresses to the people, who never attended to them. His Majesty notices "those swarms of gentry, who through the instigation of their wives, or to new-model and fashion their daughters (who if they were unmarried, marred their reputations, and if married, lost them), did neglect their country hospitality, and cumber the city, a general nuisance to the kingdom." He addressed the Star Chamber to regulate "the exorbitancy of the new buildings about the city, which were but a shelter for those who, when they had spent their estates in coaches, lacqueys, and fine clothes like Frenchmen, lived miserably in their houses like Italians; but the honour of the English nobility and gentry is to be hospitable among their tenants." Once conversing on this subject, the monarch threw out that happy illustration, which has been more than once noticed, that "gentlemen resident on their estates were like ships in port; their value and magnitude were felt and acknowledged; but when at a distance, as their size seemed insignificant, so their worth and importance were not duly estimated."

A manuscript writer of the times complains of the breaking up of old family establishments, all crowding to "upstart

London." "Every one strives to be a Diogenes in his house and an emperor in the streets; not caring if they sleep in a tub, so they may be hurried in a coach; giving that allowance to horses and mares that formerly maintained houses full of men; pinching many a belly to paint a few backs, and burying all the treasures of the kingdom into a few citizens' coffers; their woods into wardrobes, their leases into laces, and their goods and chattels into guarded coats and gaudy toys." Such is the representation of an eloquent contemporary; and, however contracted to his own age might be his knowledge of the principles of political economy, and of that prosperity which a wealthy nation is said to derive from its consumption of articles of luxury, the moral effects have not altered, nor has the scene in reality greatly changed.

The Government not only frequently forbade new buildings within ten miles of London, but sometimes ordered them to be pulled down—after they had been erected for several years. Every six or seven years proclamations were issued. In Charles I.'s reign offenders were sharply prosecuted by a combined operation, not only against houses, but against persons. Many of the nobility and gentry in 1632 were informed against for having resided in the city contrary to the late proclamation. And the Attorney-General was then fully occupied in filing bills of indictment against them, as well as ladies, for staying in town. The following curious "information" in the Star Chamber will serve our purpose.

The Attorney-General informs His Majesty that both Elizabeth and James, by several proclamations, had commanded that "persons of livelihood and means should reside in their counties, and not abide or sojourn in the City of London, so that counties remained unserved." These proclamations were renewed by Charles I., who had observed "a greater number of nobility and gentry and abler sort of people, with their families, had resorted to the Cities of London and Westminster, residing there contrary to the ancient usage of the English nation"—"by their abiding in their several counties where their means arise they would not only have served His Majesty according to their ranks, but by their housekeeping in those parts the meaner sort of people formerly were guided, directed, and relieved." He accuses them of wasting their estates in the metropolis, which would employ and relieve the common people in their several counties. The loose and disorderly people that follow them living in and about the cities are so numerous, that they are not easily governed by the ordinary magistrates; mendicants increase in great number; the prices of all commodities are highly raised, &c. The King had formerly proclaimed that all ranks who were not connected with public offices, at the close of forty days' notice should resort to their several counties, and with their families continue their residence there. And His Majesty further warned them "not to put themselves to unnecessary charge in providing themselves to return in winter to the said cities, as it was the King's firm resolution to withstand such great and growing evil." The information concludes with a most copious list of offenders, among whom are a great number of nobility and ladies and gentlemen, who were accused of having lived in London for several months after the given warning of forty days. It appears that most of them to elude the grasp of the law had contrived to make a show of quitting the metropolis, and, after a short absence, had again returned, "and thus the service of your Majesty and your people in the several counties have been neglected and undone."

Such is the substance of this curious information, which enables us at least to collect the ostensible motives of this singular prohibition. Proclamations had hitherto been considered little more than the news of the morning, and three days afterwards were as much read as the last week's newspapers. They were now, however, resolved to stretch forth the strong arm of law, and to terrify by an example. The constables were commanded to bring in a list of the names of strangers, and the time they proposed to fix their residence in their parishes. A remarkable victim on this occasion was a Mr. Palmer, a Sussex gentleman, who was brought, *ore tenus*, into the Star Chamber for disobeying the proclamation for living in the country. Palmer was a squire of 1,000*l.* per annum, then a considerable income. He appears to have been some rich bachelor, for in his defence he alleged that he had never been married, never was a housekeeper, and had no house fitting for a man of his birth to reside in, as his mansion in the country had been burned down within two years. These reasons appeared to his judges to aggravate rather than extenuate his offence, and, after a long reprimand for having deserted his tenants and neighbours, they heavily fined him in one thousand pounds.

The condemnation of this Sussex gentleman struck a terror through a wide circle of sojourners in the metropolis. I find accounts, pathetic enough, of their "packing away on all sides for fear of the worst," and gentlemen "grumbling that they should be confined to their houses"; and this was sometimes backed too by a second proclamation, respecting "their wives and families, and also widows," which was "*durus sermo* to



the women. It is nothing pleasing to all," says the letter-writer, "but least of all to the women." "To encourage gentlemen to live more willingly in the country," says another letter-writer, "all game-fowl, as pheasants, partridges, ducks, as also hares, are this day by proclamation forbidden to be dressed or eaten in any inn." Here we discover the argument realised in favour of the Game Laws of Mr. Justice Best.

It is evident this severe restriction must have produced great inconvenience to certain persons who found a residence in London necessary for their pursuits. This appears from the manuscript diary of an honest antiquary, Sir Symonds D'Ewes; he has preserved an opinion which, no doubt, was spreading fast, that such prosecutions of the Attorney-General were a violation of the liberty of the subject. "Most men wondered at Mr. Noy, the Attorney-General, being accounted a great lawyer, that so strictly took away men's liberties at one blow, confining them to reside at their own houses, and not permitting them freedom to live where they pleased within the King's dominions. I was myself a little startled upon the first coming out of the proclamation, but having first spoken with the Lord Coventry, Lord Keeper of the Great Seal, at Islington, when I visited him, and afterwards with Sir William Jones, one of the King's justices of the bench, about my condition and residence at the said town of Islington, and they both agreeing that I was not within the letter of the proclamation, nor the intention of it neither, I rested myself satisfied and thought myself secure, laying in all my provisions for housekeeping for the year ensuing, and never imagined myself to be in danger till this unexpected censure of Mr. Palmer passed in the Star Chamber; so, having advised with my friends, I resolved for a remove, being much troubled not only with my separation from Records, but with my wife, being great with child, fearing a winter journey might be dangerous for her." He left Islington and the records in the Tower to return to his country seat, to the great disturbance of his studies.

It is, perhaps, difficult to assign the cause of this marked anxiety of the Government for the severe restriction of the limits of the metropolis, and the prosecution of the nobility and gentry to compel a residence on their estates. Whatever were the motives, they were not peculiar to the existing sovereign, but remained transmitted from cabinet to cabinet, and were even renewed under Charles II. At a time when the plague often broken out, a close and growing metropolis might have been considered to be a great evil; a terror expressed by the manuscript writer before quoted, complaining of "this deluge of building that we shall be all poisoned with breathing in one another's faces." The police of the metropolis was long imbecile, notwithstanding their "strong watches and guards" set at times; and bodies of the idle and the refractory often assumed some mysterious title, and were with difficulty governed. We may conceive the state of the police when "the London apprentices," growing in number and insolence, frequently made attempts on Bridewell, or pulled down houses. One day the citizens, in proving some ordnance, terrified the whole court of James I. with a panic, that there was "a rising in the city." It is possible that the Government might have been induced to pursue this singular conduct, for I do not know that it can be paralleled, of pulling down new-built houses by some principle of political economy which remains to be explained or ridiculed by our modern adepts.



#### A College of Architecture.

SIR,—As you allowed me to open the discussion of this subject, I dare say you will permit me briefly to say a few closing words. Though, as an elderly man, not accustomed to be very sanguine, still I have been very much pleased with the latter part of Mr. Fleming's letter in this week's *Architect*, for I have great faith in a small beginning, provided it represents an admitted want. Energy and union are then generally sufficient to secure success. I shall therefore live in hope that his "next winter" will prove to be "the last winter of our discontent" in this important question of architectural education. I shall be happy to help in any way. If "the Association" only establishes in practical form a scheme of education in construction and architectural science under which the youngest pupil will be taken in hand by competent teachers until he is ready to present himself for that final ordeal, the R.I.B.A. examination, all that I have contended for will be secured with the single exception of the college building. However, still relying upon small beginnings, this, if it should be felt to be a necessity, may form a crowning work at some future day, not very long deferred, I hope; for, as I said at the outset, it is difficult to understand how all can be well with us when every other educated body has its collegiate establishment while the

architectural profession alone is without one. Without a college I fear we shall never attain to that position of dignity in the social scale which it is certain we are entitled to. We must be true to ourselves. Our realm is the realm of science, art, and industry, and surely the professors of these difficult pursuits deserve to be held in the highest honour by society. Found a college, and we forge the missing link. Thanking you, Mr. Editor, for so kindly giving your aid in the consideration of this important question, I am, faithfully yours,

The writer of the article,  
"A COLLEGE FOR ARCHITECTURE."

#### Theatre Exits and Fire Risks.

SIR,—I read with much pleasure and interest the letter which appeared in your last issue from Mr. Paul Lamberts. Personally I am also not a believer in the much-vaunted use of asbestos as a preventive of fire. And I think it important that the theatre-going public and the press should insist upon theatres being built on sound principles of construction, and that the scenery and accessories should be covered with a non-inflammable composition, as it is well known that most fires in theatres arise from contact of flame with the light woodwork and canvas with which the stage is surrounded.—Yours &c.,

AN ARCHITECT.

#### GENERAL.

**A Sum of Twenty-five Guineas** has been offered by an anonymous donor to the Art Committee for presentation to the painter of the best landscape in oils shown at the forthcoming picture exhibition at the Art Gallery, Wolverhampton. Landscapes only from the counties of Staffordshire, Warwickshire, Salop, and Worcestershire are eligible. The Mayor has offered a prize of twenty guineas to the painter of the best original figure subject in oils.

**The Autumn Exhibition** at the Manchester City Art Gallery will open to the public on September 4.

**A Private View** of the autumn exhibition of the Birmingham Society of Artists will take place on Monday.

**Dr. J. E. Elam**, a native of Leeds, died on June 25 in Auckland, N.Z., where he had been resident for the last twenty-five years. The bulk of his property, which it is expected will realise between 7,000*l.* and 10,000*l.*, he has left for the purpose of founding a permanent school of art and design for the town of Auckland.

**Mr. James Bolton**, of Wigan, has been appointed borough surveyor of Oswestry. There were 120 applicants, the salary being 200*l.* a year.

**Mr. W. Howard Seth-Smith**, of London, has been appointed architect of the new Marling Grammar School, at Stroud, Gloucestershire. The governors have secured a fine site, 8 acres in extent, near the town.

**Plans** have been prepared by Messrs. Kendall & Bakes, of Idle, for a Methodist chapel proposed to be built at Rodney.

**Plans** have been prepared for the extension of the barracks at Perth, to furnish accommodation for 400 additional men.

**Remains** of old pottery have been found at Dummer, near Basingstoke. The vases are coarsely made, either very slightly baked or sun-dried, and ornamented with bands not unlike the Norman dog-tooth, made apparently with a pointed stick.

**The Sketch-Book** of the Glasgow Architectural Association has been published, being the third volume of the work. It contains thirty-seven plates, accompanied by six pages of letter-press.

**Applications** to the number of 150 have been received for the office of borough surveyor of Sheffield, for which a salary of 800*l.* per annum is offered. Candidates have been selected to attend the next meeting of the Town Council on the 28th inst.

**A Church** designed by Mr. John Honeyman has just been opened in the picturesque village of Gullane, East Lothian, which is now much resorted to by golfers and summer visitors. The building is close by the ruins of what was once the parish church, that dates back to the time of William I.

**The Parish Church** of St. James, Norton Canes, Cannock, which was destroyed by fire in January last, is being rebuilt and enlarged under the direction of Messrs. Osborn & Reading, architects, Birmingham, by Messrs. Treasure & Son, of Shrewsbury.

**The Death** is announced of Mr. W. Eassie, C.E., at his residence, South Hampstead, on the 16th inst. The first excavations on the site of old Troy were made by Mr. Eassie at the close of the Crimean campaign, long before the time when Dr. Schliemann undertook his exploration.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, AUGUST 24, 1888.

## THE ARCHITECT AND CONTRACT REPORTER.

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### TENDERS ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

### COMPETITION OPEN.

GORTON.—Sept. 15.—Designs are Invited for Public Baths. Mr. R. T. Holland, Clerk to the Local Board, Local Board Offices, Gorton.

### CONTRACTS OPEN.

ALLITHWAITE.—Sept. 1.—For Extension of Schools. Rev. J. Hammersley, Allithwaite Vicarage, Grange-over-Sands.

ASHTON-UNDER-LYNE.—For Building House, Turner Lane. Mr. J. H. Burton, Architect, Warrington Street, Ashton-under-Lyne.

BELFAST.—Aug. 24.—For Building Warehouse and Offices. Mr. J. J. Phillips, Architect, 21 Arthur Street, Belfast.

BLACKPOOL.—Sept. 5.—For Building Theatre and Five Shops, Church Street. Mr. W. Longley, Architect, 5 Charles Street, Bradford.

BRIGHTON.—Aug. 28.—For Superstructure of the Hotel Métropole. Mr. Alfred Waterhouse, R.A., Architect, 20 New Cavendish Street, W.

CLAPHAM.—Aug. 27.—For Building Public Library, Orlando Road. Mr. H. Bulcraig, Stanley House, 20 Lydon Road, Clapham.

EASTBOURNE.—Aug. 27.—For Additions to the Princess Alice Memorial Hospital. Mr. F. H. A. Hardcastle, Surveyor, 34 Southampton Street, Strand, W.C.

EPSOM.—Sept. 12.—For Building Porter's Lodge, Tramp Wards, Day-room, Dormitories, and Dining Hall, at the Workhouse. Mr. H. D. Appleton, Architect, 157 Wool Exchange, Coleman Street, E.C.

HEADINGLEY, LEEDS.—Sept. 1.\*—For any or all of the Works in the Erection of Six Houses. Messrs. Swale & Mitchell, Architects, 98 Albion Street, Leeds.

HILLSBOROUGH.—Aug. 25.—For Building Five Houses. Mr. G. A. Wilde, Architect, Bank Street, Sheffield.

HUDDERSFIELD.—Aug. 24.—For Building Cottage House. Mr. J. H. Schofield, 42 Cooper Buildings, Fartown Green, Huddersfield.

ISLE OF MAN.—Aug. 25.—For Constructing and Erecting Wrought-Iron Girder Bridge, with Two Opening Spans across Harbour at Ramsey. Mr. T. J. Lilley, Engineer, 4 Westminster Chambers, Victoria Street, Westminster.

LEEDS.—Aug. 25.—For Enlarging St. Luke's Church Schools, Beeston Hill. Mr. C. H. Thornton, Architect, 3 Park Row, Leeds.

LEEDS.—Aug. 30.\*—For Various Works Required in Alterations and Additions to Stanley House, Pontefract Lane. Quantities supplied. Messrs. Swale & Mitchell, Architects, 51 Albion Street, Leeds.

LITTLEPORT.—Sept. 7.—For Rebuilding Brandon Creek Bridge. Mr. T. H. B. Heston, Norwich.

LODDON.—Aug. 27.—For Building Board Schools. Mr. John B. Pearce, Architect, 13 Upper King Street, Norwich.

LONDON.—Aug. 28.—For Construction of Foundations for proposed General Post Office North, St. Martin's-le-Grand. Drawings, &c., at H.M. Office of Works, 12 Whitehall Place, S.W. Mr. W. H. Primrose, Secretary.

MARYPORT.—Aug. 25.—For Building Dwelling-house, Birkby Moor. Mr. Moffatt, Birkby, Maryport.

NEWCASTLE-ON-TYNE.—Sept. 5.—For Alterations at Central Station. Mr. C. A. Harrison, Engineer.

NEWCASTLE-ON-TYNE.—Sept. 5.—For Extension of Central Station Hotel. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

PADSTOW.—Aug. 28.—For Building Three Coastguard Houses, &c. The Director of Works Department, 21 Craven Street, Charing Cross.

PETERBOROUGH.—Aug. 27.—For Alterations, &c., to Seven Cottages. Mr. J. G. Stallebrass, Architect, Bamber Street, Peterborough.

PUDSEY.—Sept. 3.—For Boundary Walls, Gates, Palisades, and Building Lodge at New Park. Mr. C. S. Nelson, Architect, Albert Chambers, Park Row, Leeds.

RADFORD BRIDGE.—For Building School for 309 Children, for the Nottingham School Board. Mr. W. Packer, Clerk to the School Board.

ST. OLAVE'S UNION.—Sept. 5.—For Painting, Cleansing and Repairs, Supplying and Fixing Hot Water Tanks. Messrs. Newman & Newman, Architects, 31 Tooley Street, E.C.

WHITEHAVEN.—Aug. 25.—For Building Dwelling-house. Mr. J. W. Mulcaster, 17 Lonsdale Place, Whitehaven.

WINDSOR.—Sept. 4.—For Building Goods Shed. Mr. J. D. Higgins, Secretary, Paddington Station.

WOOLWICH.—Aug. 30.—For Rebuilding Union Boundary Wall (250 feet). Mr. J. O. Cook, Surveyor, 1A Eleanor Road, Woolwich.

WREXHAM.—Aug. 25.—For Building Parsonage, Boundary Walls, &c. Mr. Edward Jones, Architect, 12 Temple Row, Wrexham.

\* Names and addresses to be forwarded not later than date.



## TENDERS.

## ABERGAVENNY.

For Building new House at Llanvihangel-Gobion, Abergavenny, for Mr. David Williams. Mr. ROBERT WILLIAMS, A.R.I.B.A., Architect, 8 John Street, Adelphi, London, W.C. Quantities by Architect.

T. Meadows, Abergavenny . . . . .	£728	0	0
Morgan & Evans, Pontypool . . . . .	667	7	0
T. Foster, Abergavenny . . . . .	650	0	0
J. BURGOYNE, Blaenavon (accepted) . . . . .	625	0	0

## ASHTEAD.

For Erection of House in Woodfield Lane, Ashtead, Surrey, for Mr. Henry Furze. Mr. LIONEL LITTLEWOOD, Architect, 9 Great James Street, Bedford Row, W.C.

Gregory & Co., Clapham . . . . .	£1,894	0	0
Turtle & Appleton, Clapham . . . . .	1,636	0	0
J. Seal, Epsom . . . . .	1,500	0	0
S. Hards, Ewell . . . . .	1,471	19	6
W. J. Chivington, Epsom . . . . .	1,435	0	0
W. H. Batchelar, Leatherhead . . . . .	1,285	0	0
J. Haseman, Ashtead . . . . .	1,280	0	0
H. Skilton, Leatherhead . . . . .	1,268	7	0

For Alterations to Lodge at Greville Park, Ashtead, Surrey, for Mr. Payne Jennings. Mr. LIONEL LITTLEWOOD, Architect, 9 Great James Street, Bedford Row, W.C.

J. HASEMAN, Ashtead (accepted) . . . . .	£35	0	0
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## AYLESBURY.

For Building Post Office, Aylesbury.

T. Feasey . . . . .	£4,688	0	0
E. Jarvis . . . . .	3,800	0	0
G. Orchard & Son . . . . .	3,749	0	0
J. Dorey . . . . .	3,646	0	0
S. Grist . . . . .	3,638	0	0
Lapthorn & Goad . . . . .	3,590	0	0
J. Parnell & Son . . . . .	3,562	0	0
Webster & Cannon . . . . .	5 518	0	0
G. Dobson . . . . .	3,494	0	0
C. H. Hunt . . . . .	3,425	0	0
H. Willcock . . . . .	3 325	0	0
T. H. Kingerlee . . . . .	3 292	0	0
Hughes & Stirling . . . . .	3 270	0	0
G. Green, jun. . . . .	3 163	0	0
T. MARTIN (accepted) . . . . .	3 041	0	0

## BARKING.

For Enlargement of National Schools, Barking. Mr. C. J. DAWSON, Surveyor.

Gregar . . . . .	£1,327	0	0
Staines & Son . . . . .	1,224	0	0
D. Argent . . . . .	1,223	0	0
Barnes . . . . .	1,179	0	0
Walker . . . . .	1,179	0	6
Watson . . . . .	1,143	0	0
Stephenson . . . . .	1,135	0	0
J. SMITH (accepted) . . . . .	1,110	1	0

## BURNLEY.

For Building District Stores and Four Cottages in New Hall Street, for the Burnley Co-operative Society. Mr. G. B. RAWCLIFFE, Architect, 5 Nicholas Street, Burnley.

## Mason.

Kearsley & Robinson . . . . .	£810	0	0
A. & R. Parker . . . . .	782	0	0
T. Smith . . . . .	758	5	10
PARKER BROS. (accepted) . . . . .	757	0	0

## Joiner.

J. Haworth . . . . .	309	8	8
T. Holgate & Son . . . . .	245	0	0
G. SMITH & SONS (accepted) . . . . .	220	0	0

## Plasterer and Painter.

T. S. Radcliffe . . . . .	60	17	0
Henderson . . . . .	52	7	0
J. Shuttleworth . . . . .	50	0	0
J. CHADWICK (accepted) . . . . .	49	16	6

## Slater.

Pickles Bros. . . . .	47	19	0
Whittaker & Schofield . . . . .	35	3	0
W. STANWORTH (accepted) . . . . .	34	2	0

## Plumber.

Owen & Co. . . . .	33	0	0
Collinge Bros. . . . .	28	10	0
W. REDFERN & CO. (accepted) . . . . .	26	10	0

## CARNMONEY.

For Building Teachers' Residence, Carnmoney.

J. Kidd, Belfast . . . . .	£325	0	0
M. Hearst, Belfast . . . . .	310	0	0
R. Calwell, Belfast . . . . .	247	10	0
C. M. Carrol, Whitehouse . . . . .	230	10	0
W. J. TYRRELL, Carnmoney (accepted) . . . . .	223	17	6

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For Building Offices and Cottages, India Mill, Blackburn, for Messrs. Hutton & Baynes. Mr. JAMES BERTWISTLE, F.S.I., Architect, Blackburn.

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W. & J. Gillibrand, Blackburn, bricksetter . . .	215	0	0
S. Hanson, Blackburn, mason . . .	206	5	0
J. Dyson & Son, Blackburn, flagger and slater . . .	90	0	0
A. Airey, Blackburn, plasterer and painter . . .	67	0	0
C. Cheetham, Blackburn, plumber and glazier . . .	60	0	0

For Extension of St. Paul's Vicarage, Preston New Road. Mr. WILLIAM S. VAKLEY, F.R.I.B.A., Architect, Blackburn.

KENYON & MOULDING, Blackburn (*accepted*).

## CLECKHEATON.

For Building Wesleyan Chapel and School, with Classrooms and Cottage, Whitcliffe Road, Cleckheaton. Mr. W. H. HOWARTH, Architect, Cleckheaton.

*Accepted Tenders.*

Holdsworth Bros., Wyke, mason.	
Holmes & Haigh, Bradford, joiner.	
E. & B. Briggs, Low Moor, painter and plasterer.	
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## ELTON.

For Building Three Houses, Elton. Messrs. SELLERS & HAMILTON, Architects, Union Chambers, Bury.

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J. C. Waterhouse, Elton, stonework.  
Crossley, Bury, woodwork.  
J. Mason, Elton, plumber.

## HALIFAX.

For Building Four Houses, Halifax. Messrs. COCKROFT & SHOESMITH, Architects, 3 Commercial Street, Halifax.

Parkinson & Bower, Halifax, mason, &c. . .	£1,000	0	0
Sutcliffe & Dodgson, Sowerby Bridge, joiner . . .	324	0	0
Barrett & Son, Pillion, slater . . .	194	0	0
J. C. Bradley, Halifax, plumber . . .	143	0	0

## HALSTEAD.

For Sinking Well and Making Artesian Boring for the Halstead Water Supply. Mr. J. CHURCH, Engineer.

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T. Tilley & Sons, Walbrook . . .	1,236	0	0
G. R. Rackham & Co., Colchester . . .	1,196	0	0
W. Hills & Co., London . . .	1,184	0	0
W. COOPER, Halstead ( <i>accepted</i> ) . . .	1,025	0	0

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A. Turner & Sons, Bilston . . .	2,018	1	10
H. Burnham, Stoke-on-Trent . . .	1,890	10	0
G. Wild, Hanley . . .	1,866	0	0
J. T. Clark, Hanley . . .	1,816	0	0
J. MACKAY, Stoke-on-Trent ( <i>accepted</i> ) . . .	1,790	0	0

## HASTINGS.

For Building Classroom, &c., to St. Andrew's Schools, Hastings. Mr. A. A. G. COLPOYS, A.R.I.B.A., Architect, Hastings. Quantities by Architect.

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C. Tanner . . .	210	0	0
H. & F. Rodda . . .	210	0	0
F. Cruttenden . . .	208	0	0
H. E. Pollington . . .	199	8	0
W. Coussens . . .	188	10	0
A. H. White . . .	184	16	0
W. E. Warman . . .	180	0	0
H. B. Britt . . .	178	0	0
J. Lester . . .	177	0	0
W. F. Gammon . . .	162	8	0
C. BURDEN ( <i>accepted</i> ) . . .	156	0	0

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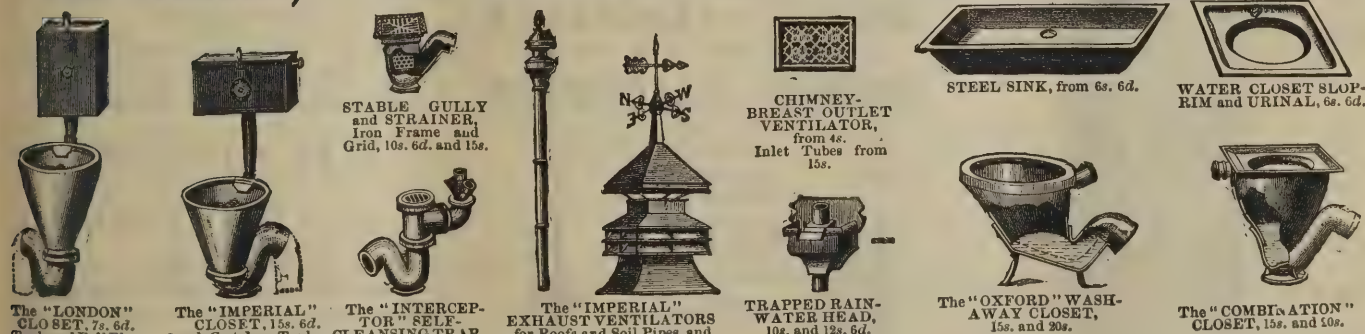
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Dunmore, Crouch End . . . . .	2,983	0	0
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## Wightman Road (3rd Section).

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Dunmore, Crouch End . . . . .	3,525	0	0
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Dunmore, Crouch End . . . . .	781	0	0
F. Pizzey, Hornsey . . . . .	767	0	0
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T. Adams, Kingsland . . . . .	814	0	0
Dunmore, Crouch End . . . . .	781	0	0
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Aspinall & Son, Finsbury Park . . . . .	3,358	0	0
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Dunmore, Crouch End . . . . .	3,125	0	0

## Lausanne Road.

Victoria Stone Co., Kingsland Road . . . . .	3,239	0	0
T. Adams, Kingsland . . . . .	2,904	0	0
Aspinall, Finsbury Park . . . . .	2,827	0	0
Dunmore, Crouch End . . . . .	2,559	0	0
MOWLEM & Co., Westminster (accepted) . . . . .	2,433	0	0

## Wightman Road (2nd Section).

Victoria Stone Co., Kingsland Road . . . . .	1,132	0	0
T. Adams, Kingsland . . . . .	1,027	0	0
Aspinall & Son, Finsbury Park . . . . .	967	0	0
Dunmore, Crouch End . . . . .	966	0	0
MOWLEM & Co., Westminster (accepted) . . . . .	843	0	0

## Haselmere Road.

Victoria Stone Co., Kingsland Road . . . . .	£2,590	0	0
T. Adams, Kingsland . . . . .	2,407	0	0
Aspinall & Son, Finsbury Park . . . . .	2,257	0	0
Mowlem & Co., Westminster . . . . .	2,122	0	0
DUNMORE, Crouch End (accepted) . . . . .	2,057	0	0

## Claremont Road.

Victoria Stone Co., Kingsland Road . . . . .	918	0	0
Aspinall & Son, Finsbury Park . . . . .	801	0	0
T. Adams, Kingsland . . . . .	793	0	0
Dunmore, Crouch End . . . . .	726	0	0
MOWLEM & Co., Westminster (accepted) . . . . .	651	0	0

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YOUNG, Architect, Bedford.

Black Bros., Bedford . . . . .	£220	0	0
Ellwood, Sandy . . . . .	219	0	0
Melcombe Bros., Bedford . . . . .	207	10	0
Freshwater & Son, Bedford . . . . .	195	0	0
Hilton & Joyce, Kempston . . . . .	188	0	0
White, Bedford . . . . .	177	0	0
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WORRALL, Kempston (accepted) . . . . .	153	10	0
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J. Radcliffe & Sons, Huddersfield, mason.  
Ramsden & Haigh, Paddock, joiner.  
T. Armitage, Huddersfield, plumber.  
J. Lunn, Huddersfield, painter.  
Pickles Bros., Huddersfield, slater.

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Borough Engineer, Town Hall.

T. Houghton, Leamington	£95	0	0
C. Duke, Leamington	82	15	0
Glover & Co., Warwick	75	5	0
R. Bowen, Leamington	74	0	0
Jenkins & Son, Leamington	71	11	6
Heatherley Bros., Coventry	69	0	0
G. SMITH, Milverton (accepted)	67	0	0

For Construction of Filter for Swimming Baths at Pump Room,  
for the Corporation of Royal Leamington Spa. Mr.  
W. DE NORMANVILLE, Borough Engineer.

Jenkins & Son, Leamington	£534	0	0
R. Bowen, Leamington	479	16	0
T. Houghton, Leamington	470	0	0
Heatherley Bros., Coventry	431	0	0
G. SMITH, Milverton (accepted)	426	0	0

## LONDON.

For Alterations to Provision Stores, 279 and 281 Edgware  
Road, W., for Mr. W. Bowron. Mr. THOMAS DURRANS,  
A.R.I.B.A., Architect, 44 Upper Baker Street, N.W.

Stevenson	£1,170	0	0
Lovell	1,150	0	0
Drysdale	1,139	0	0
Turtle & Appleton	982	0	0
HIGGS (accepted)	927	0	0

For Repairs to Eight Houses, Forest Gate, for Mr. H. Hines,  
Exmouth Place. Mr. DRIVER, Architect.

Williams	£218	0	0
Archer	180	0	0
HAWKINS (accepted)	157	10	0

## LONDON—continued.

For Covered Lawn-tennis Courts, West Kensington, for the  
Directors of the Queen's Club, Limited. Mr. ALEXANDER  
PAYNE, F.R.I.B.A., Architect, 4 Storey's Gate, S.W.  
Quantities supplied.

*General Work.*

Ashfold & Co.	£3,643	0	0
Patman & Fotheringham	3,423	0	0
Army and Navy Auxiliary Co-operative Society	3,237	0	0
Longmore & Burge	3,140	0	0
Peto Bros.	3,102	0	0
Stimpson & Co.	3,100	0	0
Hall, Bedall & Co.	2,993	0	0
Perry & Co.	2,993	0	0
T. L. GREEN (accepted)	2,983	0	0

*Ironwork.*

R. Moreland & Sons	1,446	0	0
Army and Navy Co-operative Society	1,401	0	0
A. Handyside & Co., Limited	1,329	0	0
Matt. T. Shaw & Co.	1,206	10	0
H. Young & Co.	1,195	0	0
St. Pancras Ironworks	1,159	0	0
Rownson, Drew & Co.	1,095	0	0
JOHN LYSAGHT, Limited (accepted)	1,084	18	0

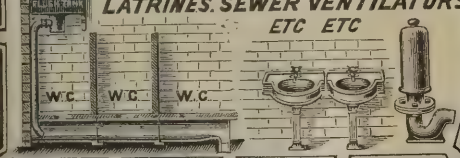
For Erection of Warehouse, Bethnal Green, for Mr. R. Letch-  
ford. Messrs. HAMMACK & LAMBERT, Architects.

Drew & Cadman	£5,043	10	0
T. Sargeant	4,667	0	0
T. Boyce	4,414	0	0
Yardley & Son	4,413	0	0
Charles Cox	4,298	0	0
Lascelles & Co.	4,280	0	0
F. & F. J. Wood	4,174	0	0

For Alterations, &c., to the Duke of Abercorn, High Street,  
Kensington, W., for Mr. S. Raven. Mr. H. I. NEWTON,  
Architect, 17 Queen Anne's Gate, Westminster, S.W.

Kirk & Randall	£1,516	0	0
Jackson & Todd	1,328	0	0
S. Godden	1,313	0	0
S. R. Lambie	1,289	0	0
T. Haylock	1,254	0	0
H. & E. LEA (accepted)	1,193	0	0

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C. G. TEBBUTT, Patentee, DASHWOOD HOUSE, 9 NEW BROAD STREET, E.C.



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## LONDON—continued.

For Improvement [Works, Linkfield Lane, Isleworth, for the Heston and Isleworth Local Board. Mr. W. B. BROMLEY, Surveyor, Hounslow.

J. Mowlem & Co., Westminster	£1,895	0	0
Nowell & Robson, London	1,830	0	0
J. HAYWARD, Hounslow (accepted)	1,675	0	0
S. Atkins, Kingston-on-Thames	1,600	0	0
J. BALL, Chiswick	1,598	0	0

For Alterations to Business Premises, New Stabling, &c., No. 60 High Street, Kensington, for Mr. R. P. Evans. Mr. J. WILLIAM STEVENS, Architect and Surveyor, No. 21 New Bridge Street, E.C.

	Stabling, &c.	Shop.
J. T. Peppiatt	£654	£395
Prestige & Co.	650	278
LESLIE & CO. (accepted)	595	305

## LYDIARD MILLICENT.

For Alterations, &c., to the Butchers' Arms, Lydiard, Wilts. Mr. WILLIAM DREW, M.S.A., Architect, 22 Victoria Street, Swindon.

J. PONTING, Kingsdown (accepted).

## MIRFIELD.

For Construction of Pipe-sewer, &c. Mr. F. H. HARE, Surveyor, Mirfield.

A. Schofield, Dewsbury	£210	11	3
GARFORTH BROS., Mirfield (accepted)	200	0	0
J. Slinger, Cleckheaton	199	19	4

## NEWHAM-ON-SEVERN.

For Construction of Brick Gasholder Tank, for the Newnham Gas Light and Coke Company, Limited.

Jones & Son, Newport, Mon., gasholder tank	£787	0	0
COCKEY & CO., Frome, gasholder (accepted)	250	0	0

## PETERBOROUGH.

For Building House, Lincoln Road, Peterborough.

Hawkins, Peterborough	£273	10	0
Guttridge, Peterborough	245	0	0
Rowe, Peterborough	236	0	0
Ireson & Pitts, Yaxley	235	0	0
Machin, Peterborough	230	0	0
Binder, Peterborough	226	10	0
Bridgefoot & Smith, Peterborough	222	15	0
SHARPE & IRESON, Peterborough (accepted)	221	0	0

## PLYMOUTH.

For Alterations and Additions to Premises, known as Clifton Villa, Tavistock Road, Plymouth, including Shop Front, and Fitting-up for Dairy, for Mr. G. R. Horswill. Mr. JAMES HARVEY, M.S.A., Architect, Plymouth. Quantities supplied.

Tozer & Son, Plymouth	£329	0	0
Samuel Roberts, Plymouth	324	0	0
A. N. Coles, Plymouth	295	0	0
J. Williams, Stonehouse	294	10	0
James Taylor & Son, Stonehouse	288	0	0
Thomas May, Plymouth	279	0	0
S. Harvey, Plymouth	256	0	0
LETHBRIDGE & SON, Plymouth (accepted)	245	0	0

## RYE PARK.

For Draining Rye Park and Spitalbrook Estates, Herts.

	Rye Park Estate.	Spitalbrook.
Holm & King	£2,449	6 6
H. Chompness	2,373	0 0
G. Bell	1,969	0 0
G. R. Rackham & Co.	1,967	0 0
J. Dickson	1,962	10 3
Williams & Neave	1,936	0 0
J. BLOOMFIELD (accepted)	1,885	17 1
A. Oliver	1,608	0 0

## ST. LEONARDS-ON-SEA.

For Building Classrooms, &c., to St. Leonards Parochial Schools. Mr. A. A. G. COLPOYS, Architect, Hastings. Quantities by Architect.

	Classroom.	Repairs.
C. Shortell	£149	0 0
Eldridge & Cruttenden	146	0 0
J. Salter	143	5 0
P. Jenkins	125	0 0
C. HUGHES (accepted)	113	0 0

## SOUTHAMPTON.

For Building a Pair of Semi-Detached Houses, and a Detached House in Park Road, Portswood, for Mr. Harry Coles, J.P.

Brinton & Bone	£2,760	0	0
Sanders	2,369	0	0
Stevens	2,361	0	0
Dyer & Sons	2,259	0	0
Franklin	1,950	0	0
WM. HARVEY, St. Denys (accepted)	1,835	0	0

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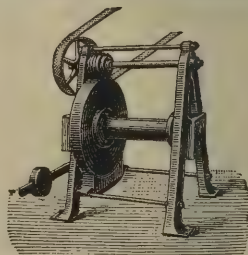
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A. Estenort, Gloucester . . . . .	£3,078 0 0
H. A. Forse, Bristol . . . . .	2,838 0 0
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C. Wibley, Bath . . . . .	2,543 0 0
Harris & Son, Woking . . . . .	2,536 0 0
Cowlin & Son, Bristol . . . . .	2,373 0 0
S. & R. Horton, Lincoln . . . . .	2,299 0 0
W. BURRIDGE, Tisbury (accepted) . . . . .	2,127 0 0

**WARLINGHAM.**

For Erection of a Detached Residence on the Westhall Estate, Warlingham, Surrey, for Mr. F. Goodingham. Mr. FREDERIC W. FRYER, Architect, 2 Pancras Lane, E.C., and Croydon. Quantities by Mr. H. J. Player, Bromley.	
J. Kick, Beckenham . . . . .	£717 10 0
T. W. Jones, Beckenham . . . . .	717 0 0

**WOOTTON BASSETT.**

For Alterations, &c., to the Castle and Ball Inn, Wootton Bassett, Wilts. Mr. WILLIAM DREW, M.S.A., Architect, 22 Victoria Street, Swindon.	
H. FLEWELLING, Wootton Bassett (accepted).	

**TRADE NOTES.**

NEW mills have been erected at Langley, near Nottingham, and special attention has been paid to the ventilation, Messrs. Robert Boyle & Son's latest improved patent self-acting air-pump ventilator being used for the extraction of the vitiated air.

THE new schools, St. Clare's Convent, Pantasaph, for which Mr. E. Kirby, of Liverpool, is the architect, are warmed and ventilated by means of the patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester and London.

A NUMBER of steel castings, weighing as much as 3½ tons, have been broken up on Messrs. Goodwin's steel foundry, Ardrossan, by means of blasting gelatine. After five fruitless attempts with dynamite on the largest casting, gelatine was used, and the casting was shattered to atoms without causing any serious damage.

A COMPANY is being formed in Aberdeen for the prosecution of the oatmeal milling business. The promoters have arranged to take up and carry on the mills at Montgarrie,

Alford, and contemplate the erection of a new mill of most improved construction on reclaimed ground at Aberdeen, adjoining Caledonian Railway Station.

A STRIKE of workmen employed at Palmer's Steel Works, Jarrow, for an advance of wages has been settled by the parties consenting to refer the matter in dispute to a board of conciliation.

THE church of St. Margaret Pattens, Rood Lane, has been closed for some little time, and Messrs. Cox, Edgley & Co., Limited, of 24 Gray's Inn Road, London, have carried out various alterations, carving, and decorative work in the chancel. This firm has for some little time been formed into a limited liability company. Much high-class work has been entrusted to the company by various architects, and from the satisfactory nature of the work there is little doubt that many other commissions will follow.

THE total tonnage of steelwork manufactured for the Forth Bridge is now 42,667 tons. Including the approach viaduct girders, about 34,500 tons have been erected.

MR. J. W. BARRY, C.E., has been nominated as engineer to conduct the inquiry agreed upon by the Thames Conservators and the Richmond Select Vestry and Twickenham Local Board with regard to the state of the Thames below Teddington and the measures to be adopted for its improvement.

IT was announced in Birmingham on Wednesday that the Army Stores Commission has revived the project of forming a central arsenal on Cannock Chase. The plans prepared in 1871, which presupposed the removal of the arsenal at Woolwich, showed a strongly-walled enclosure, six miles long by four miles broad, with nineteen detached forts.

THE trustees of the late Sir Joseph Whitworth have intimated to the Openshaw Local Board their intention of erecting fully-equipped public baths for the benefit of the inhabitants of the district, and of making a substantial contribution to the cost of a scheme for providing the township with recreation-grounds.

A LANDSLIP occurred near Northwich on Tuesday night. A shaft-like sinking, five yards in diameter, and of unascertained depth, was formed in the bed of Marston Forge Brook, and the brook disappeared. The sewerage system of the neighbourhood was destroyed.

THE City and Guilds of London Institute has issued its report of the result of the tenth examination in technology. There has again been a large increase in the total number of

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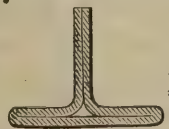
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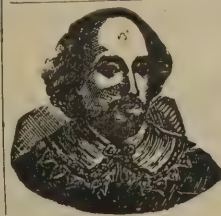
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candidates examined. In 1887, 5,508 were examined, of whom 3,090 passed; in 1888, 6,166 were examined, of whom 3,510 passed. Examinations have been held this year in 49 different subjects. The increase in the number of candidates has been most marked in cloth, cotton, linen, and jute manufacture, in plumberwork, carriage building, carpentry and joinery, and in brickwork and masonry. The practical examinations were held at 13 provincial and four London centres, but all the work executed by the candidates was forwarded to London for inspection.

At the meeting of the Yarmouth Town Council, the Town Hall Restoration Committee submitted the borough accountant's statement of expenditure:—

	£	s.	d.
1886—On account of settlement and dry rot .	597	5	1
1887—Sir Joseph Bazalgette's scheme of under-pinning .	2,720	17	7
1887-88—Messrs. Duckham & Teasdel to March 25 .	7,325	12	1
„ Amount expended since March 25 to present time .	2,024	9	1
	£12,668	3	10

It was stated that the expense of 30% had been incurred in the purchase of wood blocks for paving in front of the hall, and that a further sum of 30% would be required to be spent by the Council in fixing the flag-staff on the roof of the Sessions Court, in the drainage of the basement, and in colouring and tinting the walls and ceilings of the large hall, courts, offices, and corridors. The Council had received, on account of the dry rot in the hall, 287% 13s. 6d., and from the sale of materials used in the restoration (including the engines purchased for Sir Joseph Bazalgette's scheme), 415% 14s. 1d., making in all 703% 7s. 7d. This sum would be a set off against the two years' rents of the hall lost during the restoration, and estimated at about 800%.

A SCAFFOLDER, Miles Hillery, of Parson's Green, in the service of Messrs. Bywater & Co., contractors for the rebuilding of 185 Piccadilly, met with his death on the 15th inst. At the inquest, held by Mr. H. E. Barnes at St. George's Hospital, it was stated by a witness that the deceased was engaged on the same works. He was a skilled hand, and had held his situation for some six or seven years. Shortly before eight o'clock on Tuesday evening, witness, the deceased, and two other men were occupied in raising from the ground an iron joist, weighing about 9 cwt., which was to be placed between

two party walls to support a floor. They were standing on a scaffold composed of five boards each 10 inches wide, but there was no guard-rail or other protection for the men beyond one of the scaffold boards, which was turned up on end. The joist was being raised by means of a jib worked by manual labour, and it was required at a height of 40 feet from the basement. As it approached the scaffold it swerved round, but witness did not think it struck the deceased, although something caused him to fall. It was explained that the scaffold was properly constructed, and that if the usual guard-rail had been provided it would have been impossible to raise the joist. A large amount of technical evidence was given, but in returning a verdict of "Accidental Death" the jury expressed an opinion that the scaffold should have been better protected.

#### LOCAL GOVERNMENT ACT.

THE following regulations for bicycles, &c., under the Local Government Act will be of interest to the members of the Architectural Association Cycling Club:—

(1) The provisions of section 26, subsection 5, of the Highways and Locomotives (Amendment) Act, 1878, and section 23, subsection 1, of the Municipal Corporations Act, 1882, in so far as it gives power to the council to make by-laws regulating the use of carriages herein referred to, and all other provisions of any public or private Acts, in so far as they give power to any local authority to make by-laws for regulating the use of bicycles, tricycles, velocipedes, and other similar machines, are hereby repealed, and bicycles, tricycles, velocipedes, and other similar machines are hereby declared to be carriages within the meaning of the Highway Acts; and the following additional regulations shall be observed by any person or persons riding or being upon such carriage:—

(a) During the period between one hour after sunset and one hour before sunrise, every person riding or being upon such carriage shall carry attached to the carriage a lamp, which shall be so constructed and placed as to exhibit a light in the direction in which he is proceeding, and so lighted and kept lighted as to afford adequate means of signalling the approach or position of the carriage.

(b) Upon overtaking any cart or carriage, or any horse, mule, or other beast of burden, or any foot passenger, being on or proceeding along the carriageway, every such person shall within a reasonable distance from and before passing such cart

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or carriage, horse, mule, or other beast of burden, or such foot passenger, by sounding a bell or whistle, or otherwise, give audible and sufficient warning of the approach of the carriage.

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#### AN ARBITRATION CASE.

AN arbitration between the Edinburgh and Leith Corporations' Gas Commissioners and the two Gas Companies has just taken place, and the award of Mr. G. Livesey, C.E., the sole arbitrator, has just been presented. At the hearing, Mr. Blair, W.S., with Mr. Watson, the manager and treasurer, represented the Edinburgh Company. The Leith Company were represented by Mr. William Duncan, S.S.C., and Mr. Linton, their former manager and engineer. The two chief points in the dispute were—(1) What were the implements which had to be specially paid for under the Act; and (2) what was the sum to be paid for the stock of coals which the companies respectively had to hand over. In regard to the former, which was regulated by clause 20 of the Act, the agents for the Companies contended that the expression "implements in store or in hand" was to be construed as meaning any and every implement in their possession. Hence the claim embraced a charge for all movable property in their possession, including every wheelbarrow, shovel, railway carriage, donkey-engine, office furniture, tables, chairs and even the pins on the wall for hanging up hats and coats. Mr. Beveridge, Parliamentary solicitor, on the other hand, contended that the Commissioners had bought a going business, and that in the purchase price by way of annuities, and the lump sums of 27,000*l.* and 11,000*l.* respectively, all the implements that were in use for the manufacture and supply of gas, not only as at present, but as were required at the period of winter when the greatest amount of gas was manufactured and sold were included. He contended that all the Commissioners had to pay for was any stock of implements held in reserve for future use and which had not as yet been used. In regard to the latter, the price of the stock of coals, it would appear that the Edinburgh Company had already paid for a large stock of superior coal, which has gone down in price by 6*s.* per ton. The company contended that they were

entitled to be paid the amount they had expended, seeing that the Commissioners had taken over all their contracts. The Commissioners, on the other hand, held that they were only bound to pay, according to the agreement, the "value" of such stocks at the time of vesting. The award lays down "that no item or article is to be valued and paid for which was used or required for the efficient working of the respective undertakings at their maximum production of last winter, and that only those stores of materials referred to in section 20 of the Act, and all implements, meters, and pipes in store or in hand—whether new, or unused, or not—which are in excess of the quantities of materials, implements, meters, and pipes which were required at the aforesaid period of maximum working, are to be valued and paid for, as provided in the Act."

The effect of this decision will practically be a reduction of the claims of the Companies by upwards of 5,000*l.* In carrying out the decision the lists of both Companies were then gone through, and the various articles disallowed were withdrawn. The arbiter and the parties' representatives thereafter proceeded to the works to value the stores to be paid for.

The arbiter then proceeded to adjust the various claims agreeably with his award, and visited the various works for the purpose of examining the implements and stocks, which have to be paid for by the Commissioners, in order to attach a value to the same. The arbiter fixed the price of the unused gas in the gas-holders and pipes as on August 1 at 2*s.* 6*d.* per 1,000 feet. The valuation of the coal in store or in hand is to be made at the contract price.

#### MANUFACTURE OF STEEL.

A PAPER on manganese steel was read by Mr. R. A. Hadfield, on Tuesday, at the meeting of the Iron and Steel Institute, at Glasgow, on Tuesday. The chief drawback at present commercially is its extreme hardness, equalling that of chilled iron, and the consequent difficulty of tooling it. This difficulty possibly might with more experience be overcome. It was not so liable to honeycombs as ordinary steel, and the addition of silicon was unnecessary. It was manufactured by any of the ordinary steel-making processes, and the ferro-manganese was added in a molten state. An important use of the material was its application for wheels to compete with those made of chilled iron in America and elsewhere. They had already been used

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with satisfactory results. On the Nottingham Tramways a set ran over 30,000 miles under severe conditions, the gradients averaging as much as 1 in 18 for about one-half the route of the daily journey. Cast-iron wheels are liable to slip when going down an incline, but the chilled brake-blocks bite much more effectively on manganese wheels, enabling the car to be stopped sooner. The Chester Tramways Company had a set running for over two years, which up till now have run over 45,000 miles, and are not yet worn out. Wheels of this description can be tested with more than one hundred blows with a heavy sledge-hammer without fracture occurring, and at the same time the tyre is so hard that a chisel will not touch it. A set put to work in America has already run 200,000 miles, under heavy engines of the consolidation type, on the New York and New England Railroad. The life of ordinary chilled iron wheels did not average more than 50,000 miles.

#### NATURAL GAS IN OHIO.

AN investigation of the natural gas springs at Findlay, in the State of Ohio, has been made by a German, Dr. E. Wiesenbauer, of Heidelberg University. He is of opinion that the extent of those gas springs has been much underrated, and that at a considerable depth below the township of Findlay, there is an immense cave filled with gas which might easily explode. The professor made use of a shaft through which the gas rises to the surface, in order to connect a very sensitive telephone apparatus with the solid strata lying beneath the gas receptacles, and he came to the conclusion that a more or less solid non-conducting mass, about a mile in thickness, is interposed between the huge gas cave and a glowing furnace. At first he could not credit what the indications pointed to, but a protracted investigation carried on at various points within a radius of three miles has convinced him of the fact. He believes that the heat of this subterranean furnace is 3,500 degs. The upper portion of the strata interposed between this furnace and the cavern where the gases are stowed consists of solid rock of great depth; beneath this is a deep layer of breccia and gravel, below which is another series of strata of solid rock, the lowest layers of which are being slowly eaten away by the terrible fire. The cave he considers to be probably much larger than the great Mammoth cave in Kentucky, and to be in some places fully half a mile deep. He believes that its average distance from the surface is about 1,200 feet, and that

it is even less beneath the town of Findlay. Grave doubt, however, as to the correctness of the conclusions or observations of Dr. Wiesenbauer is entertained.

#### FORESHORE RIGHTS AT BRIGHTON.

A DISPUTE has just been settled between the Crown and the Brighton Corporation in regard of certain rights over the foreshore. The Commissioners of Woods and Forests had made a claim over the foreshore between the existing high and low marks of ordinary spring tides, and also an interest in land which, although above the existing high-water mark, lies seaward of the high-water mark of 1861. In other words, they made a claim over those portions of the foreshore which had been accreted by the erection of sea-defences. The latter claim was resisted, and the Crown began an action against the Corporation, but negotiations have been going on, with the result that the Commissioners have abandoned the claim to the accreted foreshore, and have further agreed to sell to the Corporation all the Crown's interest in the entire foreshore of Brighton, with the necessary exceptions of the land covered by the Chain Pier, and that sold to the West Pier and Aquarium companies. The consideration money is to be 525%, with 30% to cover the fee of the Crown Surveyor and the office charges for the Crown conveyance. Hitherto the Corporation have been paying an annual rental of 10%, besides royalties, which in one year amounted to 300%. The Town Council have unanimously accepted these terms.

#### CLAIMS FOR PROFESSIONAL WORK.

At the meeting of the Glasgow District Board of Lunacy on Wednesday last week, the claims by Messrs. Bruce & Hay, architects to the Board, and Mr. John Dansken, measurer, for work done in connection with the abandoned asylum project at Hartwood, came up for consideration, and the Board resolved on the recommendation of the Finance Committee to settle them for 2,375% and 1,199% 15s. respectively, as against 3,000% and 2,000% originally charged. A conference was held with Messrs. Bruce & Hay on the 12th ult., but those gentlemen left the meeting without any understanding being arrived at, as they did not indicate their willingness to reduce the amount of their claim to such a sum as the sub-committee would feel

## THE FIRE AT THE GRAND THEATRE.

The destruction of this fine Building might have been PREVENTED by the USE of GRIFFITHS' "PYRODENE," which would have made the WHOLE of the SCENERY, STAGE, and its SURROUNDINGS—in fact, THE THEATRE in every part—ABSOLUTELY NON-INFLAMMABLE.

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All Woodwork in new houses should be fireproofed with this liquid, the cost is so trifling in comparison with the preservation of the timber and freedom from risk of fire. If work is desired to be painted afterwards, Griffiths' Pyrodene Paint is best for the purpose.

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This Paint is manufactured for preservative and decorative purposes equally as for its FIRE-RESISTING qualities. The Fireproof Paint and Fireproofing Liquid is used at some of the principal Theatres in the United Kingdom.

#### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIRs.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 33 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIRs.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly, S. C. LOWE & SON.

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warranted in recommending should be paid. The sub-committee therefore unanimously agreed to recommend that the former offer of 2,000*l.* should be adhered to. At a subsequent meeting of the committee on the 30th ult., the chairman, Sir James King, explained that since the previous meeting he had had a call from Messrs. Bruce & Hay, who, after conversation on the subject, ultimately expressed themselves as satisfied to accept, if offered to them, the sum of 2,375*l.* in full settlement of their claims. The meeting, having fully considered the matter, unanimously resolved to recommend that the sum of 2,375*l.* sterling be paid to Messrs. Bruce & Hay in full settlement of their claims, on condition that they deliver up to the Board the plans of the proposed asylum, and the whole papers connected with the work done by them for the Board. Mr. Dansken was not present at the former of the two meetings, and the sub-committee ultimately resolved to recommend that his proposal to enter into a reference should not be agreed to, but that the offer of 1,094*l.* 15*s.* in all, formerly made to him, should be adhered to. At the latter meeting the clerk submitted correspondence which had passed between Mr. Dansken and him since last meeting, resulting in Mr. Dansken stating that he would be glad again to meet the sub-committee. The chairman reported that, having happened to meet Mr. Dansken, a conversation had taken place on the subject of his claim, which brought about a statement by Mr. Dansken to the effect that he would be willing to accept, if offered, the sum of 1,175*l.*, with, in addition, the amount of the account incurred to him, as to which there was no dispute, being 24*l.* 15*s.*, and amounting together to 1,199*l.* 15*s.* sterling. The meeting, having taken the matter into consideration, unanimously resolved to recommend that the sum of 1,199*l.* 15*s.* be paid to Mr. Dansken, in full settlement of his claims. The Finance Committee, at a meeting on August 8, approved of the compromise, and recommended the Board to settle with the architects and measurer on the terms stated.

Councillor Paton said the most important matter in the minutes was the settlement which had been effected with the architects and the measurer. The negotiations, he said, had been to some extent of a delicate character, but they had been carried out with the best feeling, both on the part of the Board and the claimants. No doubt the sums stated would appear to the Board to be very considerable sums of money. However, after going very carefully into the matter, and having a great deal to do in bringing this matter to a conclusion, he was satisfied if the Board went into litigation, large as the sums

might appear, they might have to pay more. He had no hesitation in saying that for the work done they were making a fair and reasonable bargain with both of the parties interested, and consequently for himself he could recommend that the Board adopt this settlement. Both the architects and the measurer were exceedingly anxious in coming to this settlement to couple it with a kind of *quasi* condition that the Board should recommend them to their successors for any work to be done in the future. Of course the Board could not do that, but he thought both Messrs. Bruce & Hay and Mr. Dansken had done their work remarkably well. Messrs. Bruce & Hay's plans for the large asylum at Hartwood were such as met the approval of everybody connected with the Board. The General Board of Lunacy were satisfied with them; the District Board were well satisfied with them, and had it been the policy of the Board to go on with the work, the plans were simply admirable. Mr. Dansken had a very large amount of work in connection with the measuring for three sets of plans. That work he did with great expedition; it was done very carefully, and he (Mr. Paton) believed it gave very great satisfaction to the gentlemen connected with the Board. He hoped that if, at some future time, their successors should require similar work, the claims of the gentlemen of whom he was speaking would be taken into consideration by the gentlemen who formed the Board of that day.

The minute was then passed.

#### PURIFICATION OF THE RIVER THAMES.

REFERRING to the proceedings of the Royal Commission on the Metropolitan Board of Works on the 14th inst., Mr. J. Bailey Denton writes to the *Times* of Monday as follows:—

"Colonel Jones, V.C., in his evidence before Lord Herschell and his colleagues, having represented that I had acted in concert with him in preferring charges against the Metropolitan Board of Works, to the effect that the Board had never given the recommendations of Lord Bramwell's Commission any serious trial, but had plunged into experiments of their own, allow me to emphasise the opinion that the permanent works of the Royal Commission which Sir Henry Roscoe declares 'will have to be adopted,' will involve a less charge upon the rate-payers of London than the experiments of the Board, which the same high authority has asserted 'will not prevent a foul

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### IMPORTANT COMMUNICATION. — WHITELEY'S FIRE.

WILLIAM WHITELEY, Westbourne Grove, London: October 12, 1887.

HOBBS, HART & Co., Limited.

GENTLEMEN,—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting powers of your Strong-room Doors and the Safes.

The recent fire at my establishment, in my opinion, subjected them to the greatest possible test, and through all they proved invulnerable. The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.

You will be pleased to hear that it has been decided to adopt your Patent Clutch Rebated Doors for all the party walls in the new buildings now in course of erection.—I am, Gentlemen, faithfully yours,

(Signed)

WILLIAM WHITELEY.



condition of the river.' The permanent works recommended by the Royal Commission, on the contrary, would not only free the river from pollution, but would afford facilities for the utilisation of the sewage at a future time, when the examples of Paris and Berlin have had their influence upon the authorities of London, and the twofold nuisance attending the tank works at the outfalls and the sending of the sewage to sea has made itself felt."

The evidence referred to in the letter is as follows :—

Colonel Jones, V.C., said he was a partner with Mr. Bailey Denton, and on May 4 he sent in a memorial to the Commission containing precise charges against the Board with reference to the London sewage. The Board had taken no complete steps to ascertain what the probable cost of the permanent recommendations made by Lord Bramwell's Royal Commission would amount to before they rushed into very high experimental costs for attempting to avoid the permanent remedy. Witness and his partner had been endeavouring for years to show what the cost of those remedies would be, and the cost was less than estimated by Sir Joseph Bazalgette. Therefore witness complained that the Board had not ascertained the cost.

Lord Herschell : But the suggestion is that further information and experiments since the date of that Commission have produced results showing that it was worth while to try some other course before going into the expenditure of two millions. This question of the disposal of the sewage is a question on which there is great difference of opinion. My experience is that no two people are agreed as to what system is good and what system is bad.

Colonel Jones : I admit all that, but I maintain that the scientific Royal Commission investigated the thing fully, and their conclusions have been thwarted.

Mr. Bosanquet : Do you say that they could have used precipitation as a means of getting rid of the sewage without these great permanent works ?

Colonel Jones : Certainly ; I am perfectly satisfied of it.

Sir Joseph Bazalgette was recalled, and stated that the course pursued by the Board for the disposal of the London sewage was the right one. If they had undertaken the permanent works suggested at a cost of four millions sterling it would have enormously increased the rates, and there would have been a revolution in London. What the Royal Commission estimated would cost 200,000*l.* a year the Board were now doing for 76,000*l.* a year ; and that was the result of careful experiments.

Several witnesses were called as to the way in which the Board's sewage works were done ; and they all vouched that they had been creditably done.

#### CAPE TOWN SEWERAGE.

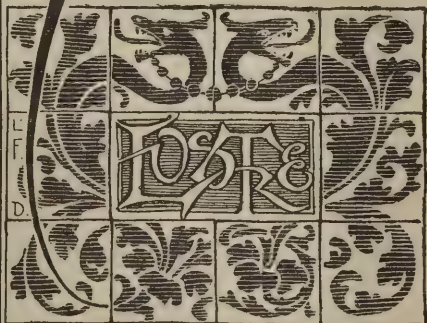
THE municipality of Cape Town has had considerable difficulty in dealing with the sewage of that city, and although the cost of the sewage-disposing works must be of an enormous magnitude, nothing yet appears to have been done to permanently remove the difficulties which at present exist. Numerous proposals have been considered ; but, finally, the authorities have retained the services of Mr. Edward Pritchard, M.Inst.C.E., of London and Birmingham, to make a personal inspection of the district, and prepare a comprehensive report thereon, and he has just left England for the Cape for this purpose.

#### SHIP CANALS.

THE project of a maritime ship canal to connect Bristol with the English Channel is being revived. This plan has found favour among many of those interested in mercantile and commercial pursuits, and the feasibility of the suggested undertaking has been favourably reported on by engineers. It is proposed to construct a ship canal from Bridgwater Bay, commencing at Stolford, on the Somerset coast, *viâ* Taunton, and terminating at Seaton on the South Devon coast. The length of the proposed canal will be 45 miles, and it is proposed to make it of sufficient capacity for vessels of the largest tonnage. The great recommendation of this proposed connection of the Bristol and English Channels is that it will effect a saving of nearly 300 miles, its main object being to get rid of the necessity for ships plying from the Bristol Channel to the English Channel ports, the Continent, and the Baltic, &c., being compelled as they are now to go round the Land's End, the Lizard, and past the Cornish and North Devon coast. It is also suggested that Stolford and Seaton, at either end of the proposed canal, could be converted into efficient harbours of refuge. The cost of construction is at present roughly estimated at 70,000*l.* per mile.

During the past month the Sheffield Chamber of Commerce has also taken up the question of water communication between

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Sheffield and the coast. The heavy railway charges seriously hamper many local industries, in addition to which some of the larger steel productions of the district do not easily adapt themselves to railway carriage. A rough inspection of the waterways between Sheffield and Goole has already been made, and a committee appointed to consider the subject and ascertain in what way water communication can best be improved so as to afford cheap water carriage for the district. The committee includes manufacturers, landowners, and coalowners.

### SHAKESPEARE THEATRE, LIVERPOOL.

THIS theatre has been erected from the designs of Mr. J. H. H. Sutton, and is capable of holding 3,000 persons, and in the construction everything that could be planned to secure safety has been carried out by means of Try's patent. The doors are under the control of a man in the attendant's box, who by pressing a lever opens all the doors in the building at once, the apparatus used fastening them, when once opened, securely back. The fireproof curtain that separates the stage from the auditorium, although weighing five tons, is lowered and raised in a few minutes by hydraulic pressure. Over the stage a network of two-inch pipes, supplied with water by a special main, will flood the building in case of fire. More than 1,000 tons of iron and concrete, it is calculated, have been used in the building of the theatre.

### ARTISTIC WALL-PAPERS.

SPECIMENS of the artistic wall-papers of Messrs. William Woollams & Co., of 110 High Street, near Manchester Square, London, W.C., so well known for their beauty and sanitary qualities in the entire freedom from arsenical matter in the manufacture, are shown at the Irish Exhibition, Olympia, at Stand D 219, and E 241. At the invitation of the Council Messrs. Wm. Woollams & Co. were pleased to be able to show, in the fixed specimens, the designs of an Irish artist, Mr. A. F. Brophy, of Limerick, whose name is well known in artistic circles. The principal work exhibited is a dado decoration, in Adam's style, called the "Savoy." It is printed in terra-cotta, No. 2927, facing Avenue D, and in blue, No. 4104, facing Avenue E. On either side of the Avenue D, front

of their stand is another dado decoration, Venetian in type, named the "Goldsmith," which is worked in blues, No. S 445, and in yellows, No. S 446; while the sides of the Stand in Avenue E are occupied by eighteen different colourings of an all over well balanced Damask pattern called the "Redcliffe," amongst which No. G 993 in yellows, and No. S 383 in blues, are particularly successful. Although Mr. Brophy is now well known as the head master of the art department of the Finsbury Technical College, connected with the City and Guilds of London Institute, it is not so well known that he is an Irishman by birth. He was a student of the Limerick School of Art, and gained the only National medal awarded in art to Limerick in 1860. Subsequently in London he gained the gold medal for furniture, and the architectural gold medal, and he is one of the examiners of national competition and third grade certificate work at the Science and Art Department, South Kensington Museum.

### MOVABLE WOODEN CHURCHES.

THE second edition of a brochure on the advantages to be derived by the adoption of movable wooden churches for temporary purposes instead of the ordinary iron ones, by Mr. William Jeffrey Hopkins, F.R.I.B.A., consulting architect to the Church Extension Society for the Archdeaconry of Worcester, has been published. From it the following extracts are taken:—

Wherever the population of a district suddenly and rapidly increases, it becomes of the utmost importance that temporary churches or mission-houses should be erected. The necessity for erecting such structures is so generally admitted, and the amount expended on them is so large, that it has long appeared a matter of great surprise to me that so very little thought has been bestowed either upon their construction or the best method of rendering them as effective as possible for the great and good purpose for which they are intended. I have, therefore, devoted much time and thought to this subject, and carefully considered what is required and what we should endeavour to attain in designs for such temporary structures, so that the greatest possible advantage may be obtained from them. I have also considered to what extent the present iron structures, so universally adopted, meet these requirements, and to what extent they are deficient, and further, whether wood may not be

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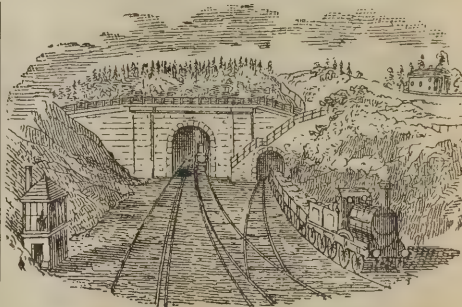


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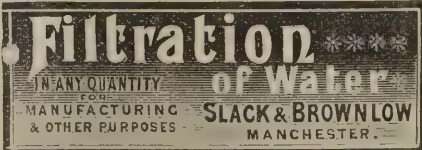
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advantageously substituted for iron in the construction of such buildings. To satisfy myself with regard to these matters, I have drawn out a design and prepared a specification for a movable wooden church, and obtained an estimate from a very trustworthy and experienced builder, showing the amount for which he is prepared to carry out that design in accordance with the plans and specifications.

There can be no doubt that the most essential requirements for such temporary structures are cheapness and comfort. It is not to be supposed that those you are endeavouring to draw to join in the services will expose themselves in winter to the coldness and draughts of the ordinary iron churches now in use, or to the intolerable close, heated atmosphere during the summer months. Even the manufacturers themselves are so fully aware of this defect of their material, that they advise their being lined with wood. Therefore a certain amount of comfort, combined with cheapness, should be considered indispensable. The supposed cheapness of iron buildings, and that alone, has secured their adoption up to the present time, and has been considered to atone for all their demerits. Yet buildings comparatively deficient in comfort, even although the cost may be a trifle less, can scarcely be considered really economical, for the deficiency tends to frustrate the object in view.

In my plans and specifications I have shown the walls to be double-boarded, and the interspaces filled with sawdust. Wood being a non-conductor compared with iron, at once insures greater coolness in the hot summer months, and greater warmth in the winter, and the interspaces being filled up with sawdust the walls become impervious to all draughts. Again, for the iron roof, which in the cheaper kind of iron churches tends much to their notorious discomfort, is substituted a wooden asphalted and slated roof—though possibly instead of slate the new patent paper material may be found still more desirable. Then again for the ordinary cheap flooring, seldom properly seasoned or tongued, I have substituted wood-block flooring, at once insuring the greatest warmth and preventing all draughts to the feet. The plan shows a building containing 1,440 superficial feet, and capable of holding 200 adults. The estimate for it is 270*l.*, to which I have added 54*l.* for chairs and other contingencies, making the cost 324*l.*, or 4*s.* 6*d.* per foot superficial.

As to the greater facility of the erection and removal of wooden over iron buildings, Mr. Hopkins says:—Every timber and every board is either disunited or capable of being dis-

united and reunited with great ease and at little cost. Every bay is designed and constructed alike, and there is nothing to prevent the removal of the whole or a part whenever desired. The whole is capable of dismemberment. The great advantages of this method of construction for temporary chapels, so far as I am aware, has never been realised. Yet how desirable it would be if the pieces of which a temporary church is composed could always be kept ready to be put together, and if the ground upon which it is to be erected could be prepared ready for its reception any day, and the building constructed in a tenth part of the time required for that of an ordinary iron church. Also if, when erected, by the simple process of taking down the west end and extending it westward by the addition of another bay or bays, the building could be enlarged to any extent required. Besides, when no longer required upon one site it could be removed to another without material injury, and without the loss and expense at present incurred on such occasions. Further, instead of its being possibly sold by auction for some secular purpose, it could simply be used again, and that over and over again, for the same good purpose. Its removal, if so constructed, would cause very slight, if any, injury to the several parts; and this great advantage should be duly weighed in considering the relative cost of it with that of an iron church.

#### PLUMBING REGULATIONS IN NEW YORK.

(Concluded from last week.)

##### VI.—UPRIGHT SOIL, WASTE, VENT, AND DRAIN-PIPES.

*Soil-Pipes.*—For each water-closet or line of water-closets and adjacent fixtures, as shown on plans, provide and set ... inch extra heavy cast-iron soil-pipe, connecting with the house-drain by a Y-branch and one-eighth or one-sixteenth bend, and extending 2 feet or more above the highest part of the roof or coping; said pipe will be increased to ... inches in diameter from the roof upward. If near a light shaft or other ventilating opening extend the soil-pipe ... feet above it. The soil-pipe to have ... inch ... Y-branches, to receive the traps of the water-closets on each floor, and ... inch ... Y-branches for the traps of ..... as shown on the accompanying plans.

*Waste-Pipes.*—Provide and set, with proper connections for each basin, bath, sink, urinal, wash-tub, or tier of same, where shown on plans ..... inch extra heavy cast-iron waste-pipe, connecting with the house-drain, and terminating above the

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roof in the same manner as soil-pipe, said waste-pipe to be increased to ..... inches in diameter from the roof upward. The waste-pipe to have ..... inch ... Y-branches on each floor; and each of the set fixtures where shown on plans to be connected therewith by short lengths of ... inch lead pipe, with ..... inch traps as specified in detail under fixtures.

**Vent-Pipes for Water-Closet Traps.**—Set for all water-closets and ..... as shown on plans ..... inch extra heavy cast-iron vent-pipe, connecting by branch lead pipes not less than ..... inches in diameter, with the crown of each water-closet trap, and ..... inches in diameter for ..... traps. Extend the main vent-pipe above the roof separately, as specified for soil-pipe, and enlarge it to 4 inches in diameter from the roof upward. Said vent-pipe to have ..... inch T-branches on each floor.

**Vent-Pipes for other Traps.**—Set for traps of all other fixtures, as shown on plans ..... inch extra heavy cast-iron vent-pipe, connected by a branch lead pipe ..... inches in diameter, with the crown of each trap. Extend the main vent-pipe above the roof separately, as specified for soil-pipes; said pipe to be enlarged to 4 inches in diameter from the roof upward. Said vent-pipes to have ..... inch ..... T-branches on each floor. There will be ..... soil ..... waste ..... vent-pipes extended above the roof of each building. The arrangement of all pipes throughout the building will be as direct as possible, and all unnecessary effects must be avoided. Grade all vent-pipes so as to discharge water collected by condensation. The bowing of vent-pipes must be avoided. Whenever practicable all pipes and traps will be left so that they may at all times be readily examined and repaired. Where they are necessarily placed in partitions or recesses in walls, they will be covered with face-boards, which will be fastened with screws, so as to be readily removed. All main soil, waste, and vent-pipes will have a diameter above the roof at least 1 inch greater than that of the pipe proper, but in no case will it be less than 4 inches above the roof. No caps, cowls, or bends will be affixed to the tops of such pipes, but in tenement houses the opening of each will be protected by a strong wire basket securely fastened thereto. All pipes above an extension roof will be extended above the roof of the main building when otherwise they would open within 20 feet of the windows of the main building or of an adjoining building. The joints between all pipes and the roof will be made watertight by heavy sheet lead flashings or .....

**Roof Drainage.**—The ..... will provide ..... leader outside

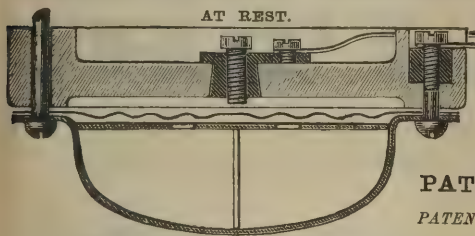
the house of galvanised sheet iron ... inches in diameter, and the plumber will connect same with the house-drain by a ... inch extra heavy cast-iron pipe, extending ... feet above ..... level and a ... inch extra heavy cast-iron running-trap so placed beneath the ground or inside the cellar wall as to prevent freezing. The ..... will provide ..... leader inside the house of extra heavy cast-iron ... inches in diameter with the joints calked with lead, in same manner as the soil-pipe, to be trapped at the base, if it opens near a ventilating shaft or window, and the plumber will make the joint between said leader and the roof by means of a brass ferrule and lead or copper tube properly connected. When there is no sewer connection the ..... will connect the leader above specified by ... inch ..... with the street gutter or .....

**Safes and Safe Waste-Pipes.**—Underline all ..... with sheet lead of ... pounds per foot, with edges turned up at least ... inches, in a secure manner, to prevent overflow. Connect all safes with a ... inch ..... pipe, discharging either into an open sink, or upon the cellar floor, as the architect may direct. The branch pipe from each safe to the main safe waste will be ... inch ..... pipe.

**Refrigerator Waste-Pipes.**—Line the spaces shown on plans and as prepared by carpenter with ..... pound sheet lead, and connect each by a ... inch ..... branch pipe with a special line of refrigerator waste-pipe. Said pipe to be ... inch ..... pipe, so arranged as to discharge over a properly trapped and Croton-supplied sink, in ..... so placed as to be convenient for ordinary use, and with the end of the pipe covered by ..... In tenement houses the refrigerator waste-pipe will be extended 2 feet above the roof. Provide over each outlet of the safe waste-pipes, and of each outlet from the refrigerator waste-pipes a strong metallic strainer. In no case will a refrigerator or safe waste-pipe be connected directly with the house-drain or sewer, or with any pipe which connects with the house-drain or sewer. There will be ... lines of refrigerator waste-pipes and ... lines of safe waste-pipes in each building.

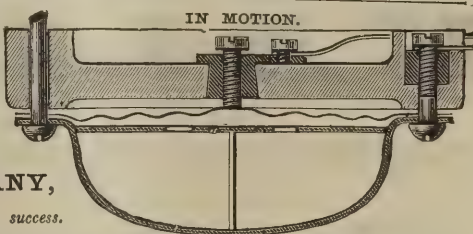
#### VII.—TRAPS.

Trap every water-closet, urinal, sink, basin, bath, and every wash-tub or set of tubs, and all other sewer-connected fixtures effectively in the manner shown on the plans. The traps to be as near the fixtures as practicable. The traps will be so arranged that in no instance will the waste from a fixture pass through more than one trap before entering the house-drain. All traps will be of the same weight and thickness as their



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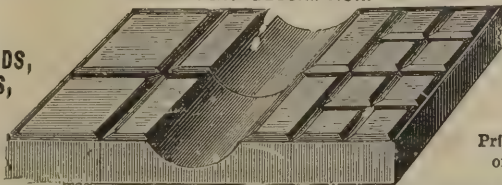
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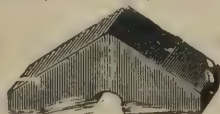
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corresponding branches. They will be well supported and set true with respect to their water levels. Special precautions must be taken to secure perfect joints between water-closet traps placed above the floor and the branch soil and vent-pipes for same. Cast-iron traps must have lead calked joints. Proper floor plates must be used with earthenware water-closet traps, and the joints made permanently secure and gas-tight by means of bolts and red lead, or ..... The vent-pipe connections for earthenware traps will be made permanently gas-tight by ...

#### VIII.—WATER-CLOSET CISTERNS.

The ..... will put up over each water-closet a ... cistern, ..... by ..... by ....., and the plumber will connect the same with the supply pipes by ... inch ..... lead pipe, and with closet bowl by ... inch ..... lead pipe arranged for the proper flushing of the closet, and leave the whole in complete working order, with the necessary chain and pull or ..... In no case will a water-closet within the building be flushed directly from the Croton-supply pipes, and the water from cisterns which supply water-closets directly will be used for no other purpose. Where water does not rise to water-closet cisterns they will be supplied from a house-tank, or pumps will be provided to properly supply the same; said pumps to be so placed, arranged, and connected as to enable tenants using the water-closets to conveniently secure at all times a proper flush for each of said water-closets. Discharge the overflow-pipe from each water-closet cistern into the bowl of the water-closet. In no case will it discharge into the soil or waste-pipe or into the drain or sewer.

#### IX.—HOUSE SUPPLY-TANK.

Provide and set on ..... a tank for drinking-water, to hold ... gallons, lined with ....., and constructed of ..... Make all necessary connections with supply and house-pipes as specified under Water-Supply Pipes. Provide a ..... inch overflow pipe and a ..... inch emptying pipe, each to be discharged as follows : ..... Provide a ..... tell-tale pipe and ..... The discharge or emptying and overflow pipes will not be connected in any way with any soil, waste, vent, or drain-pipe.

*Pumps.*—If the pressure of the Croton be found to be insufficient to supply any fixture, or any water-closet tank, provide and set up a ..... pump, to supply house-tank or ..... pumps for each ....., and make all necessary connections as specified in detail under Water-Supply Pipes.

#### X.—NUMBER, LOCATION, AND DESCRIPTION OF FIXTURES.

Supply and set up in complete working order the following fixtures of the pattern and kind hereinafter described; the exit-pipes to wash-basins, bath-tubs, wash-tubs, and sinks to be provided with strong metallic strainers; ..... water-closets, ..... urinals, ... wash-basins, ..... bath-tubs, ..... wash-tubs, ..... sinks, ..... pumps, ..... refrigerators, ... boilers, ..... ranges, located as follows : .....

#### XI.—WATER-SUPPLY PIPES.

The plumber will grade each line of supply-pipe, so that it can be completely emptied at its lowest point. Water-pipes in exposed places will be packed by the ..... with mineral wool, or other substance equally good, to prevent freezing, and will be properly boxed and cased to the satisfaction of the Board of Health. The ..... will excavate for and the ..... will insert ... inch tap in street main, if necessary. The plumber will connect tap and house supply at point indicated on the plans by ... inch ..... lead pipe, to weigh ..... per foot, to be laid ... feet below the curb level. Also place a stop-cock at ..... to shut off the water when necessary. Description of quality, diameter, and weight of supply-pipes to fixtures .....

#### XII.—GAS-FITTING.

(Signature of owner.)

#### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

11529. Will Towle and William Edmund Langdon, for "Improvements in electric lighting." August 10, 1888.  
11532. Patrick Mooney, for "An improved syphon apparatus for water-closets." August 10, 1888.  
11536. Will Verity, for "Improvements in means for opening window-sashes." August 10, 1888.  
11538. Thos. Edw. Lane, for "A new or improved wooden roof." August 10, 1888.

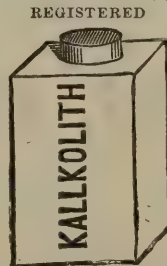
# KALLKOLITH.

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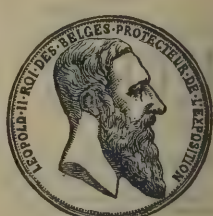


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75 Newman Street, Oxford Street, W. : Feb. 15, 1887.  
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11609. Walter Jones, for "Improvements in or relating to the means of connecting or fixing lids or covers over manholes and analogous openings in metal cisterns and tanks and like receptacles or holders." August 11, 1888.

11610. Henry Johnson, for "Improvements in bricks for pavements and floors." August 11, 1888.

11709. Newton Brook and Albert Taylor, for "Improvements in the boxes or moulds of machinery for pressing bricks." August 14, 1888.

11715. Francis Philip Wheeler and Wm. Owen Johnson, for "Improved methods and means for instantly removing and replacing window frames, ropes, and weights, for cleaning, repair, and other purposes." August 14, 1888.

11725. James Beard Faucette and Henry Lewis Fletcher, for "Improvements in distance instruments." (Complete specification.) August 14, 1888.

11737. Gustav Binswanger, for "Improvements in electric pushes." August 14, 1888.

11754. Alfred Rolfe, for "A means of escape from houses on fire, by means of an apparatus he calls a jumping-sheet or net." August 15, 1888.

11759. Thomas William Bates, for "Certain improvements in flap ventilators." August 15, 1888.

11775. Reginald Hadden, for "An air purifier and cooler." August 15, 1888.

11777. Peter Francis Vandersteenstraaten, for "An improved manufacture and treatment of compounds as substitutes for ivory, whalebone, indiarubber, varnish, and other substances." August 15, 1888.

11795. James Adams, for "Improvements in check action swing-door hinges and adjustable fittings for the same." August 16, 1888.

11796. Denis O'Halloran, for "Improvements in bell pulls." August 16, 1888.

11803. William Hetherington Nixon, for "An improved lever rack pulley, or apparatus for winding up window-blinds." August 16, 1888.

11814. Benjamin B. Snell, for "A spring catch to be applied to fasteners of sashes, doors, and shutters, which locks cross-bar, and entirely prevents opening from the outside." August 16, 1888.

11823. Arthur Warner, for "Improvements in locks particularly applicable to latch locks." August 16, 1888.

11833. William Henry Betts, for "Improvements in tobacco pipes." August 16, 1888.

11834. Miguel Pinder, for "Improvements in erasers, and

in attaching same to pencils and penholders." (Complete specification.) August 16, 1888.

#### PROVISIONAL APPLICATIONS ACCEPTED.

9360. James Cormack and William Cormack, for "Improvements in ventilators." June 27, 1888.

9460. Charles James Erasmus Kinslow, for "An adjustable mulet gauge for carpenters and joiners." June 28, 1888.

9556. James Holroyd, for "Improvements in the construction of *faience* or glazed terra-cotta mantelpieces, firesides, fronts of grates, and fenders for hearths or firesides, and such like articles." June 30, 1888.

9905. Thomas Barter and Joseph White, for "An improved device for opening and closing fanlights, skylights, the sashes of windows, and the like." July 7, 1888.

9968. William Lindsay, for "Improvements in bridges and other structures." July 9, 1888.

9986. Fred Wilfrid Scott Stokes, for "Improvements in the continuous and economical manufacturing of cement." July 10, 1888.

10149. Stephen Tuddenham, for "Improvements in metal strips for sash bars, also for construction of or strengthening sash or other frames for holding glass." July 12, 1888.

10163. Christian Wraa, for "Improvements in life-saving appliances for rescuing people from high buildings, and other places, in case of fire."

10288. Facharial Pack and James Pack, for "Improvements in brick-moulding machines." July 16, 1888.

10460. William Clark, for "A horizontal condensation bar in combination with an improved metallic sash bar for glass roofs and similar structures." July 19, 1888.

10755. Thomas Guest Normanton, for "Improvements in inlet and outlet ventilators." July 25, 1888.

10842. William Davies, for "Improvements in flushing apparatus, more especially adapted for flushing urinals." July 26, 1888.

11001. Sidney Turner, for "An improved instrument and apparatus for use in the mechanical reproduction of writing, drawing, and other delineations." July 30, 1888.

#### PATENTS SEALED, AUGUST 17, 1888.

10762. William Lewis, for "Improvements in the arrangement and construction of fireclay, terra-cotta or firebrick domestic fireplaces." August 5, 1887.

10764. Frederick Wilfred Scott Stokes, for "Improvements

## Wilson's Patent Dioptrical Pavement Lights.

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Fig. 1 shows how the ordinary prism or semi-prism, by receiving the rays on a plane reflecting surface, throws them forward at one angle only, in parallel lines close to the ceiling.

Fig. 2 represents the Patent Dioptrical Lens, and shows by comparison how the rays of light, striking on the curved inner surface, are reflected forward through the face of the lens in every direction, filling the whole angle of 90°, thus illuminating the apartment from floor to ceiling and from wall to wall.

From the above diagram it will be seen wherein consists the advantages claimed for Wilson's Patent Lenses. The objection to the semi-prism is that it reflects the light, as shown in Fig. 1, at such an angle as to be of little use, and more especially if the line of the ceiling is below the line of the pavement; then the value of the semi-prism as a light projector is entirely lost.

It will be seen also, on reference to the above diagrams, in Fig. 1 that the first row of semi-prisms obstructs the rays of light from each succeeding row, whereas in Fig. 2 the bulk of the rays of light are projected at such angles as to pass unobstructed into the room.

*The correctness of these illustrations can be practically demonstrated to any architect desirous of testing them.*

PRICE LISTS AND ESTIMATES ON APPLICATION TO

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in the methods and apparatus for drying cement, slurry, and the subsequent cooling of the burnt cement." August 5, 1887.

11829. William Robert Crozier, for "An improved locking sash fastener." August 31, 1887.

13342. Robert Platt, for "An improved window sash fastener." October 3, 1887.

14990. John Knight, for "A metallic reversible tread for steps, stairs and manhole covers in roads and pavements." November 3, 1887.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of this journal, give notice at the Patent Office in the prescribed form of such opposition.

7702. Geo. Samuel Marshall, for "Improvements in cord-holders for roller and Venetian and other blinds." May 26, 1888.

9733. Elliott Emanuel, for "A double fan for wash-out closets." July 4, 1888.

12341. Edward Kirby, for "Improvements in window fastenings, commonly known as sash or casement fastenings." September 12, 1887.

13902. Robert Punshon, for "Paving, flooring and roofing material." October 13, 1887.

14056. John Edward Beanland, for "A new or improved hinge or connection adapted for either doors, gates or windows and means or method of fixing same." October 17, 1887.

14146. Charles Taylor and George Benjamin Taylor, for "Improvements in chucks for lathes, part of which improvements are also applicable to vices and to cramps." October 18, 1887.

15596. John Wesley MacKnight, for "Improvements in artificial pavement." November 15, 1887.

16234. John Sheldon, for "Improvements in wall ties or band iron." November 25, 1887.

9634. William Lampas Gregg, for "Improvements in the method of and machinery and apparatus for manufacturing bricks." July 3, 1888.

10312. George James Snelus, Thomas Gibb, J. C. Swan, Herbert Smith and William Whamond, for "Improvements in and connected with the manufacture of cements." July 16, 1888.

#### NOTES ON SPECIFICATIONS RECENTLY PUBLISHED.

"Improvements in fireproof curtains for theatres, &c." 12817. 1887. Mr. W. H. Clark, architect, John Street, Bedford Row, London. This invention relates chiefly to the use of silicate cotton, slagwool, or such like substances, in combination with wire-netting or sheet metal for forming a fireproof curtain, and the curtain is raised and lowered by means of pulleys and balance weights.

*Claim I.*—The fireproof curtain consisting of a metal frame A B, suitably stayed and filled in with silicate cotton, slagwool, or other equivalent incombustible fibre enclosed between wire net or plain or corrugated sheet metal, or both wire and sheet metal, substantially in the manner described and shown in the drawings.

"Improvements in metallic roofing-plates or shingles." 8808. 1888. H. H. Lake, London. (Communication from J. S. Thorn, Philadelphia, Pennsylvania, U.S.)

*Claim I.*—In a metallic roofing plate or shingle the device of an elevation or struck-up lower edge, terminating in an abrupt downwardly-bent flange, decreasing in depth as it extends from the centre to the edge of the shingle.

"Improvements in fowl-houses, coops, dog-kennels, &c." 12820. 1887. R. R. Fowler, Prebendal Poultry Farm, Aylesbury.

*Claim I.*—In fowl-houses or coops, dog-kennels and the like, making the sides and, if desired, one of the ends to be hinged thereto, and providing same with means for adjusting their position substantially as and for the purpose set forth.

*Claim II.*—The portable house for fowls, dogs, and other animals described and shown.

"Improvements in bricks for wells and such like purposes." 12872. 1887. M. H. Blanchard & Co., Brick and Tile Works, Bishops Waltham, Hants.

*Claim.*—In the manufacturing of bricks to be employed in the construction of wells and the like; the imparting to same in process of manufacture and when in the plastic state the necessary contour or configuration, so as to dispense with the subsequent cutting and trimming substantially as herein set forth.

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# The Architect.

## THE WEEK.

ALTHOUGH a complete series of works illustrative of the history of painting seems at present unattainable, owing to the difficulty of obtaining examples of Greek work, yet it is absurd to lead people to imagine that painting arose with CIMABUE. By introducing some Egyptian portraits out of Mr. FLINDERS PETRIE'S collection in the National Gallery, the old bounds are broken through. We may in consequence expect to see in the Gallery not only paintings of a very early date, but examples of English and foreign sculpture. Although the portraits were found by Mr. FLINDERS PETRIE in Egypt, it does not follow that they were portraits of Egyptians. They may represent foreign settlers who were buried according to the local rites. It must not be supposed that they are comparable to the Egyptian sculpture in the British Museum. They are interesting for their age, and as being the earliest examples of distemper painting in England. Of course great care will have to be taken of the portraits. The Egyptian papyri with which visitors to the British Museum were long familiar have had to be removed from the staircase walls, through fear of injury to the colours from exposure to the light. We may be confident that in the National Gallery no less care will be taken, and the old portraits could hardly be under more watchful eyes than the Director's.

THE exhibition of the Royal Society of Artists was opened in Birmingham on Tuesday. There are several works which have been seen in Burlington House, such as Mr. GOODALL'S *Misery and Mercy*, Mr. WATERHOUSE'S *Consulting the Oracle*, Mr. PETTIE'S *Scene from "Peveril of the Peak,"* Mr. SCHLOESSER'S *Beethoven*, Mr. HERMAN HERKOMER'S *Hubert Herkomer, A.R.A.*, Mr. MURRAY'S *Uplands of Picardy*, &c. The exhibition is therefore above the average. Whether provincial societies are wise in seeking so many works from the metropolis is another question. Unless we are mistaken, visitors rarely pay much attention to the works by local artists which are found in the round room of Birmingham. They seek out what comes from a distance, and the artists of Birmingham do not derive as much profit from the exhibition as they have a right to expect. Unfortunately it is necessary to think of the expenses of the exhibition, and consequently a crowd must be attracted.

AN Exhibition of Paintings by Old Masters was opened on Tuesday in the Municipal Art Gallery of Birmingham. The curator, Mr. WHITWORTH WALLIS, has been successful in obtaining works from the Duke of NORFOLK, the Duke of WESTMINSTER, the Earl of COVENTRY, &c. But it is probable that the pictures which will have most interest for connoisseurs are those from the gallery of Sir THOMAS BARRETT-LENNARD, of Essex. His collection has hitherto been unknown to the general public, but more than ninety pictures have been lent from it to the Birmingham Gallery, mainly portraits of the DACRE-LENNARD family. One of them is by HOLBEIN, a portrait of the Lord DACRE who was executed for his share in a poaching affray. Among the works lent by the Duke of WESTMINSTER is a *Holy Family* by FRA BARTOLOMEO, the most genial of the monastic painters. The *Tobias and the Angel*, by CLAUDE, well known from the English engraving, is also in the Gallery. Both REYNOLDS and GAINSBOROUGH are well represented.

THE staircase of the Hôtel de Ville, Brussels, on the walls of which M. WAUTERS painted two remarkable historic works, has been further adorned with six portrait-statues in alabaster by M. DE GROOT. The figures are portraits of eminent members of the Municipal Council arrayed in the costume of ancient celebrities. Thus, M. BULS, the well-known burgomaster, appears as ROGER DE LEEFDAEL, who was châtelain of the city in the thirteenth century. The militant councillor, M. GODEFROY, has the rôle of JEAN DE RELEGEM, who was a man of war as well as a scholar. The figures are shown in animated attitudes, and in that way appear more suitable for the ancient edifice than if they

were represented as immobile, and from the variety of costumes—military and civil—additional interest is imparted to the sculpture.

MR. ELLIS LEVER, who has the courage to support his convictions by his purse, proposes that an International Exhibition should be held next year in Dublin. After the fiasco this year in Kensington, few will care to see a repetition of that mode of rendering justice to Ireland. Mr. ELLIS LEVER would no doubt be willing to contribute liberally to an exhibition in Dublin, but he cannot be aware of what it would cost. In 1853 WILLIAM DARGAN, the contractor, who, like Mr. LEVER, believed in the efficacy of exhibitions, spent more than 50,000*l.* (some say more than 100,000*l.*) over one which was held on the premises of the Royal Dublin Society. It was thoroughly international, and a more attractive collection of paintings and other works of art was never seen within the walls of an exhibition. Several of the ablest experts in Ireland endeavoured to draw lessons from the exhibits for the benefit of their countrymen, but no gain of any sort was derived by Ireland from so much expense and enthusiasm. DARGAN was ruined by the exhibition, as the savings of many years of labour were expended in buildings and the payment of a horde of officials. Can Mr. ELLIS LEVER see any grounds for believing that a more fortunate issue awaits his proposed exhibition of next year?

WE are glad to find that Mr. HAWKSLEY has been successful in his action against the Liverpool Corporation; indeed, that result was to be anticipated, for the city on the Mersey has failed in all its undertakings of late years. It was shameful on the part of the Corporation to have defended the action. Mr. HAWKSLEY prepared the plans for the Liverpool Waterworks, and without the influence of his name no scheme of the Corporation was likely to be successful. But as soon as the Act was obtained and the works were started, Mr. HAWKSLEY was shelved. Allegations were made about his competency to design an embankment. The Liverpool Corporation seemed to think that the engineer who has had more experience than any man in England in hydraulic works could be ruined by their aspersions. An inquiry was got up, and, of course, Mr. HAWKSLEY was the gainer. He took an action to recover the balance of his fees, and the arbitrator has awarded every penny that was claimed. The unlucky ratepayers will have to pay the whole of the costs. No one will pity them, for in all questions relating to architecture and engineering, Liverpool has shown that the spirit of fair play has departed from the city.

THE August number of the *English Illustrated Magazine* contains an article on Rugby, for which Mr. W. H. OAKELEY has supplied sketches. His style is well suited for that class of work, as it conveys the impression made by buildings as a whole, and effect is not sacrificed for the sake of detail. Publishers have a prejudice against sketches by architects, believing that they are a sort of working drawings; but examples like those by Mr. OAKELEY in the *English Illustrated Magazine* are strong enough to disabuse people who hold notions of that kind. Mr. OAKELEY'S sketches show a power of recognising what is best in a building, and they are a great improvement on many of the architectural sketches which are seen in periodicals and newspapers.

THE new museum of the Luxembourg has been again reopened, after the closure which is necessary every year in order that the latest works purchased by the State may be introduced. But this time there are fewer changes than usual, for the most important of the works which were acquired from the last Salon will be kept for the International Exhibition of next year. The pedimental sculpture by M. CRAUK is now to be seen free from scaffolding and tarpaulins. While the relief was concealed it was supposed to be a glorification of sculpture, as the door over which the work is placed leads into the sculpture gallery. It is now found that painting has a share in the honours. In the centre is the figure of Glory, who with her right hand presents a crown to the representative of painting, and with her left hand honours Painting with a palm branch.



## THE BRITISH MUSEUM.

THE last return of the British Museum bears a close resemblance to a good many balance-sheets of public and private companies which appear about this time of year. The figures in it show signs of decline, as if the Museum had not escaped the general depression or was no longer able to compete with rival establishments. In 1885 there were 584,660 visitors to the General Collections, last year the number was 501,256. Taking the returns for the same years from the Natural History Museum, the numbers are respectively 421,350 and 358,178. If the totals of the two years are compared, we find a decrease of more than 146,000 people. Against the falling off in the visits of the general public may be set the increase of visits for study to special departments. Last year 182,778 people were admitted to the Reading Room, or an increase of more than 20,000 beyond the number for 1885; but, on the other hand, there were much fewer students in the Sculpture Gallery and the Gold Ornament and Gem Room.

The Trustees have more cause for dissatisfaction. The Turkish Government having declined in 1882 to renew the firman under which explorations were conducted for several years in Assyria and Babylonia, the most important sites have had to be abandoned. In consequence, the Arabs are seeking for treasures in their wild way, and stones which are records of the ancient empires are being scattered or destroyed. It was discovered that many tablets were in the possession of natives, but before any steps could be taken for their recovery they were seized by the Turkish Government and deposited in the Museum of Constantinople. The desire expressed by the Trustees for an opportunity to inspect the tablets and ascertain their character is a revelation of how the Turks aid in the diffusion of knowledge. Dog-in-the-manger fashion, the Turks will make no use of the tablets—possibly they are incompetent—nor allow any of their esteemed allies to do so. The Trustees say it is most desirable that they should have the support of the Government in seeking to obtain the authority to resume the excavations. It is not creditable to us as a nation that they should remain unfinished, and unless something is done to complete the work it would be better, for the sake of posterity, if we had not interfered with the places. All we have accomplished is to afford facilities for the dispersion and destruction of objects which were probably of extreme historic importance.

Another subject which demands prompt attention is the overcrowded state of the Reading Room in the Museum. Readers who have about twenty years' experience of the room often express surprise at the crowds which are now to be found there. To secure a seat it is indispensable to attend at an early hour. The extra tables which were supposed to serve in emergencies are constantly occupied. The number of readers has increased from 105,310 in 1875 to 182,778 in last year, and it may be assumed that this year there will be more of them. It would be satisfactory if one could be assured that the difference between the two years represented *bonâ-fide* students. But any supposition of that sort would be corrected by a walk through the room. The most cursory examination will discover that a very large proportion are employed in reading novels, or turning over the leaves of books of pictures. The Trustees fear that "literary men engaged in genuine research will gradually find themselves pressed out of the use of the room by the throng of readers for general information," or in other words, people who read for amusement will expel the men for whom the room was constructed. It is suggested that the difficulty might be met by having a special room with modern works for the seekers after general information; but it should also be possible to give less facilities to novel readers and seekers after amusement.

A cry for more room is also heard from the new Natural History Museum. It appears that within four years 270,000 specimens have been added to the Department of Zoology, and space is therefore much needed in galleries for mammals and fishes, and in the bird and insect rooms. Nowhere, it is said, is increased accommodation more necessary than in the "spirit building," which is so fully occupied that the collections of mammals and shells preserved in spirits have had to be transferred to the main building.

This state of things is a not uncommon case in Govern-

ment buildings. The officials dictate their requirements, and the business of the architect is to comply with them. But it generally happens that insufficient allowance is made for contingencies, and, as can be observed at the Natural History Museum, the additions of four years are enough to cause great inconvenience. What will be the state of the departments at the end of forty years, assuming that additions will regularly come in, it is not difficult to imagine.

The additions in the Book Department this year are mainly of a theological class. Among the manuscripts and documents acquired we find mention of a waxen book, 8 $\frac{3}{4}$  inches by 6 $\frac{1}{4}$  inches, consisting of seven wooden tablets, coated with black wax on both sides, and two covers waxed on the inner sides, inscribed with documents, written with the stylus in tachygraphic or shorthand symbols, and with a few memoranda in Greek. It is supposed to be of the third century. To the same period belongs a wooden board, 13 inches by 7 inches, painted white, and inscribed on both sides in ink, with thirteen lines from the "Iliad," iii. 272-285, probably for the purpose of teaching scholars. These objects are most interesting as revelations of ancient modes of teaching.

The report of the Departments of Prints and Drawings contains several interesting items. On the first page we find it stated that the series of drawings by JACQUES ANDROUET DU CERCEAU for his work "Les plus excellents Bastiments de France," which was formerly in the King's Library, are now in the Print Department, and therefore are more easily accessible. Among the additions are some studies by MICHEL ANGELO. On the back of sketches of ancient sculpture are eight studies of a figure of a child, which are supposed to be for the marble statue of the *Virgin and Child*, in the church of Nôtre Dame, Bruges. The design of this work is generally ascribed to the great artist, although the modelling having none of his "terrible manner" may have been entrusted to one of his pupils. A copy of the series of M. GUFFEN'S "Episodes de l'Histoire d'Anvers," which we reproduced this year, was also presented to the Department. The Museum has at length obtained the original design, by Sir R. WESTMACOTT, for the group of sculpture in the pediment of the portico. Additions have been made to the series of engravings illustrating the works of painters of all countries.

The acquisitions to the Department of Greek and Roman Antiquities comprise many things which are valuable. First is a collection from the excavations by Mr. FLINDERS PETRIE at Tel-Defenneh, or Daphnæ, in Lower Egypt. Admiral SPRATT has presented a marble torso of a *Dionysos*. Among the purchases are a large sarcophagus of terra-cotta richly painted, and of a late period of Etruscan art; a series of twenty-six moulds for terra-cotta from Tarentum; a gold necklace of delicate workmanship from Cyprus; a silver girdle of square panels connected with hinges, the ornament representing alternately two gryphons and a figure in Assyrian costume holding two wild goats; a lekythus or jug with figures—one of ATHENÊ differs from the rest in colour, as it is white with gilding, as if to suggest a chryselephantine statue.

Mr. A. W. FRANKS is not only the head of a Department, but one of the most liberal benefactors of the Museum. His name appears as presenting objects on almost every page. Among the gifts to his own Department are about 1,250 specimens of English pottery, including five of WEDGWOOD'S large portrait medallions, and several of the smaller ones. Mr. C. J. LUCAS has presented two Mediæval watering-pots found in Liverpool Street, which are rather rare objects. The Trustees of the Christy Collection have purchased the objects discovered by M. PECCADEAU DE L'ISLE on the banks of the river Aveyron, which represent prehistoric art. Among them are three sculptures in the round, two of them representing reindeer and the other a mammoth, and a number of drawings upon stone, some of which show great artistic power. They are well known to anthropologists, and are valuable, as they show that man's first attempts as an artist were not imitations of stitching, or the scratching of lines on gourds and pottery. Art began with imitations of living things, and the rude sculpture from Bruniquel demolishes the theory of SEMPER and other imaginative speculators of his type.

The acquisitions to the collections of Natural History do not much concern us, but it may be noted that Mr.



RUSKIN has presented his "Colenso Diamond," a magnificent symmetrical yellow crystal, weighing 130 carats, from South Africa; and his "Edwardes' Ruby," a unique crystal, weighing 163 carats, on the condition that the inscriptions he furnishes will always appear on the labels with the specimens.

### GLASGOW CATHEDRAL.\*

By JOHN HONEYMAN.

ALTHOUGH Glasgow Cathedral is one of the smallest, it is by no means the least interesting of British cathedrals. Like every other, it requires to be very carefully examined before it is understood; indeed, I know no other so likely to lead a hasty observer to false conclusions. The first thing which will probably strike the visitor to Glasgow Cathedral is the peculiarity of the site. Immediately to the west there is exactly the kind of site on which we would expect a cathedral to be built—the summit of a gentle eminence, with the ground sloping gradually from it in all directions, except north. But the building was reared entirely on the eastern slope, even the west gable being about 50 yards from the highest point, which was formerly somewhat further west than it is now. This peculiarity is not without significance. It points to the fact that even during the troublous times which preceded the constitution—or reconstitution—of the see by David I., all traces of the original Christian establishment had not been obliterated—that the spot where St. Mungo worshipped and was buried was still known and venerated. That spot was much more likely to be in the sheltered glen on the banks of the Molendinar than on the exposed knoll on which the castle latterly stood. Over the saint's tomb the new church would naturally be erected, regardless of the structural difficulties to be encountered.

As we have not even a fragment *in situ* of older date than 1180, we must begin our history there. That fragment, which is situated at the south-west corner of the present crypt, seems to indicate that the church built about that period had a crypt. Crypts were at that time fashionable, and here the configuration of the ground naturally suggested one. We know nothing more of this twelfth-century church, but it seems probable that it had no nave, as we find that very early in the thirteenth century a nave was designed and partly built, as it still stands. This has a Transitional base, and even its plan may be recognised as Transitional; but it is nevertheless unlikely that any of it was erected in the twelfth century—certainly no part of it above the level of the base course. Inside we find in this nave the bases on the bench-table with square plinths and delicate mouldings decidedly earlier in character than the bases in the crypt, but still distinctly thirteenth-century work. Towards the middle of the thirteenth century—not I think before 1240—the crypt and choir were erected. It seems quite evident that from the commencement of this great work operations on the nave were entirely suspended, but that the transept at least was completed about the same time as the choir. The work was thereafter carried on westward slowly but steadily till the nave was finished, about forty or fifty years after the choir. It will be noticed that the base of the choir is entirely different from that of the nave. The same base is carried round the chapter-house, which was probably founded at the same time; but the chapter-house above the level of the base was not built till after the completion of the nave—probably about 1425–1435. It was left down like the nave, so that nothing might interfere with the completion of the choir.

Immediately to the south of the transept there is a building carried up to the level of the choir floor, and evidently designed to be higher, which may have been intended as an extension of the transept, though I very much doubt it. This gives us the third variety of base which will be noticed on looking at the building, and no part of it was erected before 1480—probably later. It is, perhaps, as well when we come down to this period that our conclusions as to dates should be verified by documentary evidence, for whereas there is no material difference between English and Scotch contemporary styles down to the end of the thirteenth century, or nearly so, after that period they differ very considerably, and we find even local variations of Scotch styles. Anyone unfamiliar with the later Scotch styles, and who did not know that this crypt was erected by Bishop Blackadder in the sixteenth century, would be very much puzzled by this building. It is as unlike English work of the same period as can well be imagined. At first sight—looking at the outside of it—one would say that it was Early English. The builders seem to have done their best to copy from the adjoining crypt; the plan of the window jambs is very much the same, and even the mouldings, but I have never seen an instance where a late workman has managed to make an

early capital or base. The late work is sure to be detected there if nowhere else; and here, as both can be seen from the same spot, it is interesting to compare the one with the other.

The spire is the most modern portion of the building. The upper part of the tower was not erected till 1425 by Bishop Lauder, and the spire considerably later, so that we have the following sequence:—1st, portion of a building erected about 1170–1190; 2nd, a part of nave, circa 1200–1220; 3rd, crypt and choir, 1240–1280; 4th, upper part of nave, 1270–1300; 5th, chapter-house, circa 1425; 6th, tower, 1425 (Lauder); 7th, south crypt, 1500; 8th, spire. So that we have the remains of work done from time to time during a period of about 300 years.

I shall now refer to some of the most interesting and peculiar features of the building. The most interesting, of course, is the crypt. I have seen crypts which were as interesting to me, because more puzzling, but none so beautiful. In this respect there is nothing at all to compare with it. It was the last important crypt built in Britain, and the designer had at his disposal the whole resources of the perfected Pointed style. He had also a most suitable site for the purpose, and it must be admitted that he made the most of his opportunities, as both the general disposition and grouping of the parts and all the details are alike admirable. The approach to the crypt from the upper church is by two stairs going down north and south from the transept turning east into the aisles. The north approach, east from the transept, has been completed in accordance with what has no doubt been the architect's original design, but he has not been allowed to repeat his beautiful design on the south side. Here it is that the fragment of old work to which I have referred still remains. Even at the risk of spoiling the principal entrance to the crypt, and in spite of extraordinary difficulties, that ancient piece of wall and a few superficial yards of vaulting have been retained. It is difficult to imagine an adequate reason for taking so much trouble about this little bit. It will be seen that the walls of the small chamber have actually been built under its Transitional vault at three different periods! Perhaps the most striking feature of the crypt is the variety of effect produced by the disposition of the small piers carrying the floor of the choir. The usual formality of parallel rows of piers and arches of the same height is entirely absent; there is a symmetrical arrangement of groups, but even that is not at first sight apparent, so skilful is the plan and so varied the consequent treatment of the vaulting. The floor of the crypt under the lady chapel, following the slope of the ground, is on a lower level than that of the main crypt, so that here another element of variety is introduced. The eastmost bays are divided from each other by solid walls, no doubt for structural reasons. These walls however, are pierced by coupled trefoil arches utilised as piscinæ and credence tables combined—an unusual but very beautiful form. It will be observed that the one in the centre has been altered. The centre shaft and the trefoil arches have been cut out and a single arch inserted, in the beginning of the fourteenth century, as the arch mouldings plainly tell us. We have it also on record that Bishop Robert Wishart was buried here—between the altars of St. Peter and St. Andrew—in 1316.

At the south-east corner is a well, commonly called St. Mungo's Well, which has apparently been a source of danger to the building, which is here very much rent and twisted. At the opposite corner is a rich early door—the carving of which is much decayed—giving access to an apartment which I am inclined to think served as the chapter-house. I have never supposed that the apartment immediately above this was the chapter-house, but it did not occur to me that the one on the ground-floor (it is not sunk) may have been used for that purpose, till quite lately, when visiting it with Archbishop Eyre and Mr. Pugin, when the latter pointed to the raised canopied *sedile* at the centre of the east side as strong evidence of this. In the chapter-house at Inchcolm the seat is raised exactly in the same way, and at Crossraguel and elsewhere there is a similar niche formed. This lower apartment may have been in use ten years before the upper part was built. A turret stair connects it with the sacristy above, and with the lady chapel.

Returning to the transept by the north aisle, it will be observed that the vaulted porch at the transept door is much later work than the crypt. It is, in fact, late fifteenth-century work. I have no doubt that originally there was no communication between the aisles of the nave and those of the choir. The only communication between the nave and choir was in the centre, where the screen now stands. Perhaps the contraction of the central access by the erection of the screen suggested the idea of forming the connection between the aisles as we now find it—or nearly so. In the nave the most noticeable points are that the bases of the responds at the transept and the bases of the shafts on the aisle walls are distinctly older than the bases of the main piers and the bases of the west responds. The piers might at first sight be taken to be older than the piers of the choir, but while I think the builders have been influenced by an older design (as in the case of the chapter-house), they have taken such liberties with it in

\* From a paper read at the visit of the British Archaeological Association on the 27th inst.



matters of detail as to prove that the work was actually executed after the erection of the choir. Thus, on these piers we have not only the later base, but the fillets on the shafts, and a somewhat clumsy late variety of capital. Again, the mouldings of the arcades have rather an early look, but, of course, if I am right as to the piers, they cannot be early. I do not rely upon that, however. It is quite clear that these are not Transitional mouldings. We have such mouldings in their simplest form at Jedburgh, Dryburgh, and elsewhere, and there—as invariably during the Transitional period and for some time thereafter—each group of mouldings is in section square—at their greatest projection the mouldings would touch lines at right angles to each other. Here, however, each group would be enclosed by part of a circle, and being almost devoid of under-cutting they are entirely unlike anything to be found in the early part of the thirteenth century. They are also quite unlike the mouldings in the choir executed about the middle of that century, so that we really cannot find a place for them at all till near the close of the thirteenth century. We would not find a place for them then in England, but they illustrate the divergence in styles to which I have already alluded as beginning about this period; and, in fact, we find such mouldings with little relief slightly varied down to a very late period, as, for example, at Melrose and Haddington. The triforium is evidently later than that of the choir, and so is the clerestory. There is a peculiarity about the north clerestory wall which I sincerely wish did not exist, namely, that it is seriously “off the plumb.” I do not know the exact inclination, but I have no doubt it is more than two feet off the perpendicular. In the choir we have the somewhat unusual feature of a pier in the centre carrying the east gable, and over it four lancets, instead of the more usual five. The plate tracery of the aisle windows is also remarkable. The design of the lady chapel, and of its east end especially, is exceedingly elegant. At the south-east corner there is a piscina, which is peculiar, in that the drain is not taken down to the soil, but is simply taken through the wall and discharged through a gargoyle on the outside. I have not noticed such an arrangement anywhere else in this country, but it occurs, I believe, at Notre Dame, in Paris, where there is not the same excuse for it, the piscine being only a few feet above the level of the ground.

The chapter-house, as it is called—but what I prefer to call the sacristy—enters from the north side of the lady chapel. It is a lofty vaulted chamber, with a pier in the centre, but there is nothing to indicate that it was ever used as a chapter-house, but rather indications in its ample fireplace and ambries that it was meant for a sacristy. The south crypt, commonly called Blackadder’s aisle—or, more correctly, as Mr. Andrew Macgeorge has shown, the aisle of Fergus—is chiefly interesting as an illustration of the pertinacity with which the Scotch architects stuck to the earlier forms long after their use had been discontinued in England. From the outside this looks much more like Early English than sixteenth-century work, and even inside we can find no trace of the Perpendicular style, yet it was not begun till the very end of the fifteenth century, and was probably not completed till the early part of the sixteenth. With the exception of the effigy of Bishop Wishart, already referred to, and two stone coffins in the crypt—one of which has on its lid a very elegant foliated cross—there are at Glasgow no early monuments worthy of mention. This seems rather remarkable, especially as in the neighbouring churchyard at Govan a variety of most interesting pre-Norman monuments still remain. It is almost enough to raise a suspicion that St. Kentigern’s Cathedral has, after all, been reared on the wrong spot! The monument of Bishop Law at the south-east corner of the lady chapel is an interesting example of its kind, and there are several others in the same style outside worthy of notice.

Mr. Loftus Brock said it must be remembered that the British Archaeological Association existed not only to call attention to interesting points with respect to a building, but also to those which had regard to the stability of the structure itself. They had heard from Mr. Honeyman that some parts of the walls of the nave were actually 2 feet out of the perpendicular. Standing where he did he could see a defect in the structure which was far more serious than that. If they turned their attention to the lofty arch which supported the tower or spire they would notice a very dangerous crack not only on the north-east side, but also on the south-east side. It went right up through the spandrel of the arch, up to the roof, and through some modern facing, which was perhaps not yet twenty-five years old, showing that there was some motion in the building yet. He would venture to say that if the attention of the authorities was directed to it, grave structural loss would be saved. If the tower, which was unique in Scotland, fell down, it would not only be a heavy expense to rebuild it, but also a very great loss to the structure itself, because a tower rebuilt was never the same tower again. If it fell, it would fall to the east through the crypt and do a very great deal of harm. It must also be remembered that the foundations of old churches were never their strongest part.

Here they had the fact that the building had been erected on a hillside, and the movement with such a position was always downwards. Their warmest thanks were due to Mr. Honeyman for his paper; but he would ask Mr. Honeyman to reconsider the portion of his paper referring to the lady chapel. He ventured to think the arrangements on the east side would not be sufficient for a lady chapel, and he took it that this portion of the building was primarily intended for a retro-choir.

### TRONDHJEM CATHEDRAL.

IN an account of a visit just made to Norway, the following description of the cathedral at Trondhjem is given by the *City Press*. The old cathedral alone is worth a visit from London if only to gaze on such an ancient building, with its glories of the past, and its wondrous restoration of to-day. The Norwegians are proud of this old house of prayer, which has shared a worse fate than any English cathedral, the Abbey of St. Albans included. The accumulation of rubble and modern brick with which it has been patched up in the last two centuries is now giving way to stone, and most faithfully are the modern builders gathering together the fragments of the ancient builders’ skill of eight hundred years ago. The nave and aisles are now in the hands of the builder; huge engines are at work within, and the pavement is covered with a small tramway on which the stones are run in and out, and shot underneath the transepts, where service is now held, into the nave. The work completed is the exterior and interior of the eastern end. The southern door is a marvel of Norman architecture, and of Mediæval imagery and carving round the portal. The chapter-house is the most complete, and bears a great likeness to our own Temple Church, or rather the western end of it. The windows and pillars are said to have been designed and even worked by the same hands, and there is a stern simplicity about it quite unlike the adjacent part of the edifice, which is the choir or octagon, as it is called. The service of the English Church is here held during the summer months. The octagon or choir chapel is a masterpiece of architecture and of carving. There is a complete ambulatory, and in the wall of the sacred building itself most interesting features of Norman work, whilst the delicate carving of the arches which encircle the altar and its surroundings present the workmanship of a much later date. The reredos is of white marble, much resembling that of Exeter, about which so much litigation arose, and the altar is of white marble with grey plinths and pillars supporting it. In the transept, which is the most ancient part, wooden pews and seats, reminding one of the interior of St. Saviour’s, Southwark, are placed, but the shadow of antiquity is everywhere protesting against these modern abominations. On the altar table is a short surplice and a chasuble of red velvet and gold braid, whilst in the beautifully restored chapel of St. John the Baptist, now used as a vestry, are the plainer clerical garbs of the officiating Lutheran minister. Ascending some steps at the southern end of the transept, we pass along the triforium, and have a fine view of the cathedral below, and find ourselves in the chapel of St. Olaf, whose body the Danes have carried away, and in whose memory the great cathedral of St. Olaf, at Kirkwall, was also reared. The western end seems to have suffered the most, and the painstaking architect has gathered together fragments of pillars, windows, lancets, and arches, showing the missing links, and here from twelve to half-past one and from six till seven ladies of the district sell to the visitors pictures and views of the work of the restorer for the benefit of the fund. Sixteen thousand kroner are annually spent in a work which must go on for many years; two-thirds are found by the Norwegian Government and one-third by the communal or municipal authorities.

### NEWCASTLE SOCIETY OF ANTIQUARIES.

A VISIT was lately paid by this Society to South Durham, and in the course of the excursion the churches of Gainford, Winston, and Staindrop were visited, and described by the Rev. J. R. Boyle. He said that in the county of Durham the close of the eleventh century and the early part of the twelfth century must have been characterised by very great activity in the building of churches. There are very few churches which have not some architectural features belonging to that time. He believed he was right in saying of the majority of the churches in the county of Durham, that the principal portions of the structures belong either to the episcopacy of Bishop Pudsey or his immediate successors. The architecture of Gainford Church belongs to the time when the Norman features were passing away, and Early English features gradually were being introduced. In the grounds of the rectory there are a number of fragments of Saxon crosses; but in the structure of the church itself he believed there is nothing of an earlier date than the close of the twelfth century. He would



not be far from the truth if he said the arcades and chancel arches belong to about the year 1190. He explained various details in connection with the architecture of the church, and drew special attention to the decoration of the hollows of the capitals of two of the pillars, as being the first indication of decoration in such parts. The church, which has been carefully restored, was examined, and the old registers, which are well preserved, and the old communion plate, one piece of which is the manufacture of Ramsay, of Newcastle, were exhibited, and several interesting fragments of Saxon sculptured stones examined. At Winston Mr. Boyle briefly described the church, which, he said, judging by what remains of the original architecture, is of very little later date than Gainford Church; he fixed the date of the church at from 1210 to 1220. The walls of the chancel, a considerable portion of the north wall of the nave, and the arcade between the nave and the south aisle are old work; and the remainder of the church is modern work, and bad indeed as modern work. Built into the south wall of the chancel, on the outside, is a beautiful thirteenth-century grave cover. Mr. Boyle described the font, and expressed his belief that it is of the time of shortly after the middle of the thirteenth century. A well-preserved piece of Saxon cross was examined, and also the communion plate, one piece of which is dated 1632. Staindrop Church Mr. Boyle described as one of the most interesting churches in the county, because it still possesses features of pre-Conquest date. Early in the eleventh century King Canute, after a barefooted pilgrimage to the shrine of St. Cuthbert, gave certain territories in south Durham to the church at Durham, and among them was the vill of Staindrop. What were the ecclesiastical arrangements at Staindrop is not known, but there are portions of the church which can scarcely be of later date than the time of Canute. Mr. Boyle described the additions made to the old Saxon church, showing how carefully the builders have preserved the old original work, setting an example to modern "restorers." Mr. Boyle described the Neville monuments in the church, the earliest of which are to the ladies of the Neville family belonging to about 1250, judging by the style of costumes on the effigies. The monument of Ralph, Lord Neville (who died 1314), and his two wives, is one of the most magnificent sepulchral monuments in England; its proper place is the centre of the chancel, but it has been removed in comparatively recent times to make room for an extremely vulgar monument. In another part of the church is a wooden monument to the last Lord Neville and his two wives. It was suggested by Mr. Boyle that these two handsome Neville monuments should have railings around them in order to preserve them from the ill-usage of sightseers.

#### BAYHAM ABBEY.

AN excursion was lately made by the Sussex Archæological Society to Bayham, when the Abbey was visited and described by Mr. St. John Hope, of the Society of Antiquaries. The Abbey is, in its details, one of the best preserved in England. The stone used is from quarries in the neighbourhood, sandstone of the Hastings beds. But it is of great hardness, and has worn so well that the ornaments, capitals, &c., preserved retain a degree of sharp and clear outline which is really wonderful under the circumstances. In one sheltered place even traces of the original colour remain. Though there was, Mr. Hope said, a more or less complete history of the Abbey from its foundation to its fall in 1526, very little could be learned from it touching the history of the buildings. They must, therefore, see what the buildings themselves could tell them. Despite the apparent singularity of plan, the whole of the original setting out of the main building was perfectly normal. They had the cloister placed, as was most usual, on the south of the church which covered its north side, with the other buildings ranged round the east, south, and west sides on the ordinary Benedictine plan which White Canons adopted without any important variation. The architectural history of the church, which was the only building exhibiting any noteworthy changes, was particularly interesting. Although it was originally of the accepted normal type, the existing ground plan was of very remarkable character, and so far as his experience went was quite unique. The statutes of the White Canons ordained that no new house of the Order should be founded unless there were at least twelve clerics (or canons) to colonise it, and unless certain buildings should have been built for their reception, viz. a church, dorter (that is, dormitory), frater, guest-house, and gate-house. As the dorter and frater were invariably buildings on the first floor, this of necessity implied that other apartments, which were always found, viz. the vestry, chapter-house, and warming-house under the dorter, and cellars for stores, &c., under the frater, were also included in the original work. At first the buildings named in the statute were not necessarily of a permanent character, and the rule was considered sufficiently obeyed if temporary erections were set up

to go on with, but after the canons had taken up their abode in the new abbey, they forthwith commenced the construction of their permanent buildings if funds allowed. The order in which they worked was somewhat as follows:—First, they built so much of the church as was absolutely necessary for the services; then the vestry, chapter-house, and warming-house, while the floor above that formed the dormitorium, or dorter; then they built parallel with, but remote from the church, a series of cellars and other offices on the ground, with the refectory, or frater, above; and after these an important group of buildings on the west side of the cloister, known as the cellarium. The abbey kitchen generally stood west of the frater, or adjoined it on the south of its western end; the infirmitorium, or "farmery," usually stood to the east of the cloister, but clear of main buildings, with which it communicated by a passage. The cloister—the centre of everything—was a quadrangular area, which covered alleys on each of its four sides, enclosing a grass plot in the centre.

The extreme measurement of the nave from east to west, including the chancel, is 257 feet, and the height from the ground to the plate-beams of the roof 50 feet, whilst its width is only 24 feet. It is crossed by a transept 86 feet in length, and their intersection was formerly surmounted by a central tower "supported by clustered pillars, highly ornate and elegant." The general character of the architecture is that of the thirteenth century. The apse is trigonal, and resembles that in the Grey Friars or Franciscan monastery in Major Stileman's grounds at Winchelsea. In its present state the abbey ruin consists of the nave of the church, the cloisters, and a portion of the rectory. At the north-eastern end are the remains of a staircase which, passing behind the high altar, went round the interior of the church. Traces of the high altar are still perceptible, and near its site is a stone inscribed thus:—"Ella de Sackville, Doughter of Ralphe de Dene, founded this Priorie in honovr of St. Marie, in the reign of K. Richard ye First. The Grovnd was given bye Syr Richard de Thorneham. The Præmonstratensian Canons of Brockley, with those of Beavliev, were incorporated and placed here, and their charters were confirmed bye Kyng John, K. Henry III., and K. Edw. II. ;

#### TESSERÆ.

##### Marble in Ancient Rome.

A. THOMSON.

IN no respect do the ancient Romans appear to have been more profuse than in the expense they incurred to procure their favourite "marbles," and even at the present day the traveller is astonished by the incredible quantities still to be seen. It has been justly remarked that there is not a door-sole nor a guard-stone at the corner of the meanest court in Rome, which is not of marble or of granite from some ancient edifice. The palaces and churches of modern Rome owe all their ornaments to this taste of the ancients. St. Peter's presents us only with the accumulated importations of imperial Rome, for, if we except a few blocks lately brought from the Alps to restore S. Paolo fuori le Mura, we are satisfied there is not a pillar or a slab to be found which was not brought to Rome betwixt the end of the republic and the building of Constantinople—a period of betwixt 400 and 500 years. In the year 1700 the antiquary Ficoroni personally counted the columns in Rome, and he says he found 8,000 existing entire, and yet these can be but a very small proportion of what once were there. In the public buildings of London, with all its boasted luxury and splendour, we cannot at the moment remember more than four pillars worthy of the name, and they are those erected in the George III. Library at the British Museum. They are of red Scotch granite, cost about 1,000*l.* each, and are very respectable pillars, but they might "hide their diminished heads" if brought into comparison with many of those of Rome. How much wealth was expended, what human sufferings were endured, that Rome might be adorned! The quarries were the "penal settlements" of antiquity.

##### The Word "Picturesque."

R. P. KNIGHT.

No word corresponding to this, or of exactly similar meaning, is to be found in any of the languages of antiquity now extant, nor in any modern tongue, as far as I have been able to discover, except such as have borrowed it from the Italian, in which the earliest authority that I can find for it is that of Redi, one of the original academicians of La Crusca, who flourished towards the end of the sixteenth century. The Spanish does not appear to have received it; at least it is not to be found in the great authorised dictionary of that language, the completest work of the kind that has been hitherto executed, and far exceeding those of the French and Italian academies in every respect. In our own language it has been received into very general use; but, nevertheless, it has no



been considered as perfectly naturalised among us, for Johnson has not admitted it into his dictionary, though he has received the word *pictorial*, as the Spaniards have the word *pictórico*, both of which answer in meaning to the Greek adjective *γραφικός*, except that, in the Greek, the arts of writing, painting, and engraving being expressed by the same verb, any adjective or metaphor taken from it must of course have a more extensive and less determinate signification. The Abbé Winkelman, who understood nothing of the Greek language, translates *γραφικόν*, in a passage of Strabo, picturesque; and Price has received his interpretation without examining it, though as the object to which the epithet relates is an Egyptian temple of plain architecture, of which the geographer merely says that it had *οὐδὲν χαρίεν, οὐδὲ γραφικόν*, it does not afford much either of illustration or confirmation to his hypothesis. Had the German antiquary chanced to stumble upon such an expression as *γραφικὸν πῆθρον*, we cannot doubt from the specimen which we have already had of his learning and sagacity, but he would have translated it picturesque stream, and this would have exactly suited my friend's purpose. Unfortunately, however, had his usual accuracy of research or any suspicions of the infallibility of his guide led him to look at the context, or even to consult his lexicon, he would have found that this sonorous phrase only means ink, more commonly called *μέλαν γραφικόν*. According to the idiom of the Italian language, by which the meaning of all adjectives ending in *esco* is precisely ascertained, *pittoreesco* must mean after the manner of painters; whence we may reasonably infer that painting had at that time appropriated to itself certain descriptions of objects for representation, or had adopted some peculiar mode of representing them different from simple or common imitation, which peculiar mode would naturally give them a peculiar character in the eyes of persons familiar with and skilled in that art.

#### Classicists and Romanticists.

J. P. PROUDHON.

The romantics reproached the established tradition with two things: the first with setting aside fifteen centuries of history, whence the narrowness of its thought, and the want of life and originality and truth in its works; the second with not even understanding its models, and being thereby thrown into endless contradictions. Is the history of Christendom nothing? said they. Is it not as much matter for poetry as the pagan mythology and wars? And if it is artistic material, why are we to confine ourselves to the limits of your classics? And then with your worship of classic form, which is your ideal, you sacrifice expression, which is not less important, and so fall into conventionalism and monotony. The ancients carved their calm gods because they believed in them; we, who seek action and life, common labours and civic duties, cannot accept them as models. The classics argued that art is absolute, universal, and eternal; that its rules, which are the laws of the beautiful, are, like the rules of logic and geometry, immutable; that the ancients practised them because they understood them, and hence left us incomparable works; that there is only one and the same art in which nations more or less succeed; that the revolutions of history do not necessitate revolutions in literature and art, as the Renaissance artists proved; that to abandon a tradition, consecrated by so many masterpieces, would be to retrograde, and substitute the worship of the commonplace for the worship of form; finally, that if the new school thought it could excel the old, it had better try, and would then be judged by its performance.

#### Colour Sense of the Ancients.

M. LUBBOCK.

Mr. Gladstone was struck with the fewness of the colours mentioned by Homer, and the inexact manner in which the colour terms were used, and in 1858 he suggested that colours were probably not appreciated at that day as they are now, the organ of colour and its perceptions being probably in a comparatively undeveloped condition. The next to take up this question was Lazarus Geiger. In a paper read at Frankfort-on-the-Maine in 1867, he represented that the power of perceiving colour, as it now exists, must have been attained gradually and progressively, and that even within historic times. Suggesting that probably the organs of man's senses some thousand years ago were by no means in the same condition as now, and that they were then incapable of their present functions, he applied this idea to the power of distinguishing colours, and examined the indications of colour-perception presented by the works of different ages. Neither in the Vedas, the ancient religious works of the Hindus, which are supposed to have been written from fourteen to sixteen hundred years B.C., nor in the Zendavesta, or books of the Parsees, or Persians, which must have been written before the eighth century B.C., did he find indications of developed colour-perception. From both any mention of blue colour was entirely absent, a fact the more striking since the Vedas are full of descriptions of the sky, while the latter, the Zendavesta,

specially treats of light and fire, which are represented as originating in the sun. Similarly green colour is not mentioned either in the Rigveda hymns or in the Zendavesta, though both often speak of the earth. The size and height of trees are considered, but not the green colour of their leaves. Again, he finds, as Mr. Gladstone did, how inaccurate are Homer's descriptions of colour, and adopts the same suggestion, namely, that colours were probably not perceived at that time as they are now. In 1867 M. Hugo Magnus, in a work entitled *Die Entwicklung des Farbensinnes*, published at Iena, gave reasons for believing in the same progressive appreciation of colours as Geiger; in the same gradually increasing sensibility to colour impressions. Believing that at first mankind merely perceived white and black, the presence or absence of light, he believed red to have been the first true colour to be recognised, and that the power of perceiving the other colours was gradually acquired in the order of the colours in the solar spectrum. Thus he believed the perception of red to be followed by that of yellow, these two colours seemingly having the longest and most powerful waves of ether. The perception of green followed, then of blue, and lastly of violet. Dr. Magnus believed that it was whilst red and black were alone distinguished that the hymns of the Vedas were written, that yellow was also recognised in the time of Homer, and that it was only at a later date that the perception of green followed, and lastly that of blue and violet. He believed it to be only in quite recent times that the numerous shades of the solar spectrum have been defined with exactness, that the evolution of the colour-sense is still incomplete, and that the time will come when the ultra-violet rays will be perceptible to the eye, though their existence is only at present recognised on account of their chemical effects. It has already been pointed out that colour-blindness has been supposed to be a return to the primitive condition of vision in mankind. A further examination, however, shows that, even supposing primitive vision to have been such as Dr. Magnus suggested, this could not be the case. In colour-blindness the perception of red is almost invariably lost, while that of blue and violet is present. The reverse is supposed to have happened when colours were first appreciated by mankind. Red colours are thought to have been perceived, when blue and violet were not yet distinguished. Thus there is no resemblance between colour-blindness and the condition which is supposed by Dr. Magnus to have prevailed when the colour-sense was in a primitive condition, nor can it be looked upon as an indication that such an undeveloped state of the colour-sense ever existed.

#### Roman Architecture.

E. A. FREEMAN.

The architecture of classical Rome is, like the literature of classical Rome, imitative. Italy, the land to which the world practically owes the great discovery of the arched construction, may very likely have had a native architecture, as well as a native literature, in the days of the kings and the early consuls. But the architecture of classical Rome was a mere imitation of that of Greece. It was indeed but an imperfect imitation. The Roman architects were not so besotted as to cast away their own great invention of the arch, and to fall back on the less flexible, less diversified, constructive system of the Greek entablature. But, just as they spread a varnish of Greek forms, Greek metres, and what not, over their native Italian literature, so, in like sort, they spread a varnish of Greek decoration over their native Italian construction. Buildings whose real construction was that of piers and arches were masked with a decorative imitation of the columns and entablature of a Greek portico. But as it was in other things, so it was also in architecture. The true Roman spirit was masked only, and not destroyed, by the fashion of Greek imitation. As that spirit shows itself in the satirists, the historians, and even here and there in the poets themselves, as it stands out more clearly still in the mighty fabric of the Roman Law, so there are classes of Roman building in which the national arched construction stands out, masked but feebly, or not at all, by the varnish of Greek decoration. In an aqueduct or an amphitheatre, Greek features, columns and their entablatures, are either absent altogether or are something so secondary as to have but little share in the general effect. In buildings of this kind the round arch, the main constructive feature, does really stand out as the feature which gives the building its main architectural character. And, as Mr. Petit remarked long ago, the step from buildings of this kind to some of the plainer forms of the later Romanesque is very slight indeed. Some of the great German churches, such for instance as the three great Rhenish minsters of Mainz, Worms, and Speier, where the interior elevations consist of square piers supporting perfectly unadorned round arches, have surely a great deal in common with a Roman aqueduct. In both we see the round-arch construction standing boldly out in its most undisguised form. And buildings of this kind, whether aqueducts, amphitheatres, or churches, which rely almost



wholly on their unadorned constructive elements, may undoubtedly be grand and striking in the highest degree. Still a style of architecture would be narrowly limited in its resources, if it were for ever confined to such elements as these. The massive, unadorned, square pier was suited for many purposes; but there were also many purposes which asked for something more graceful, something which better offered itself for enrichment. There was one feature of the Greek constructive system which the Roman architect could do something more than blindly imitate. There was one feature which he could really adopt, for which he could find a place in his own system as appropriate as that which it had held in the system to which it belonged by birth. The Grecian column was freely employed by the Roman architects, but for a long time, in truth during the whole of the purely Classical period, it was used only in a feeble, hesitating, and inconsistent way. Roman architects built porticoes and colonnades after purely Grecian models, without bringing in any feature of the national constructive system at all. Or columns and entablatures after the Grecian model were attached as a mere decorative mask to buildings really built according to the national mode of construction. At last, in days which we are taught to look upon as days of decline, in days which are looked upon as days of degradation both for literature and for art, the great step was taken which was to give Roman architecture an harmonious and consistent form, the step which was to make its chief decorative feature become also the chief feature of its construction. In the Greek system the column had boldly and honestly supported the entablature. In the Roman system of construction the round arch answered to the entablature. What then was needed to make the column a real feature in the Roman system was to make it discharge in the Roman construction a duty strictly analogous to that which it had discharged in the Greek construction. In the Greek system the entablature had rested on the capitals of the columns; what was now needed was to make the round arch rest on the capitals of the columns also. This simple change at once gave Roman architecture a form both consistent in construction and graceful in decoration. Next to the introduction of the arch itself, no architectural revolution has been so great and so lasting in its results. The man who first boldly set his arch to rest on the capitals of his columns made a change which led the way to all future developments of arched architecture, round and pointed alike.

#### Vitruvius.

C. R. COCKERELL.

The æsthetical principles of architecture, as handed to us from the Greeks by Vitruvius, concur with the notions of ancient philosophy, and have not been controverted by the modern; and though subjected of late years to some rude attacks, they have never been superseded, and we can follow no better text-book in the consideration of our subject. Those principles apply to every style and invention of architecture which the world has hitherto known; they belong to our physical and intellectual nature, and will never change but with an alteration in these. When the works of Vitruvius were first discovered, they were accounted a revelation to the craft, and called "divine" by Sulpitius, the first translator; and, nearly 200 years after, Perrault, in his translation, calls them "a very singular piece, and an inestimable treasure in the opinion of the learned." Eighteen translations, in forty-one editions, are enumerated to this day. In 1807 the philologist Schneider republished Vitruvius. "My whole scope," says he, "has been to purify the text, so as to enable men learned in art to reconstruct and understand the theories of Vitruvius, hitherto obscured by interpolations and vicious translations." But he detracts from the merit of his work by a severity of criticism as uncandid as it is derogatory to the character of his author. He declines his apology, as "writing neither as an accomplished philosopher, an eloquent rhetorician, nor as an expert grammarian, but as an architect, laying down rules useful to those who build." He calls his language obsolete and plebeian, accuses him of pride and envy, and rates him as a morose, inept, infirm old man, querulous, and vulgar. But Schneider was the less justified in such treatment, as being weak upon those points in which his author was most strong, for he says:—"On architectural subjects, or that which has to do with the subtleties of the art, and the questions and disputes concerning them, I neither could nor would have anything to say." So that the science has received no direct advantage from the labours of Schneider, and yet how much was to be done might be understood by ten discoveries in confirmation of the theories of Vitruvius made within a few years. The slanders of Schneider had been adopted in this country with little honour to the parties, and no advantage to architecture. Vitruvius remained the father of our art, and was entitled to our respect as the text-book of our studies. Having been appointed surveyor to the warlike engines and stores of the empire by Augustus, Vitruvius was endowed with leisure, and very probably was instructed to collate the Greek authors on our

art, whom he enumerates, and who were collected and deposited in the magnificent library instituted at that period. He appears, then, with singular advantage as transmitting the well-digested and received principles of the greatest masters who had thought and written on architecture to modern times, and the principles thus derived directly from the Greeks merit our closest attention.

#### Technical Note Books.

H. CONYBEARE.

The power of analysis and methodic arrangement, which your previous mathematical training has been intended to confer, can alone enable you to master, in so short a time, even a general knowledge of so wide a field as the practice of civil engineering presents; and it is desirable that you should be most strongly impressed with the paramount importance of keeping note books and taking notes of every engineering work you read and every engineering fact you observe. Such notes should be as succinct and synoptical as possible, so as to occupy a minimum of space and time. It is impossible to overrate the importance of such a system of record—nothing fixes facts or formulæ so firmly in the memory as writing them out, and nothing clears the brain of the writer so efficiently as the mental manipulation essential in arranging his facts in their proper order of sequence, and putting them into the smallest number of words possible. Your note books should afford a permanent, succinct and classified index of your reading—a *catalogue raisonné* of the engineering facts and results you have possessed yourselves of, either by study or personal observation. In each note you should always refer intelligibly to your authorities, in order that, if ever actually engaged on the particular description of work to which it refers, you may be able to read up your authorities over again. George III. used to say that "he did not believe his lawyers knew more law than other people, but they knew where to find it."

#### Elasticity of Wrought-iron.

Z. COLBURN.

It is commonly held that, within certain limits of strain, iron is perfectly elastic. No matter how often it may be stretched or deflected, up to a certain point, the general belief is that it will come back to its original form every time the load is taken off. There are high authorities, however, who maintain that iron takes a permanent set under even very moderate strains. If we are to understand that the set is exceedingly small, this may be true. The late Mr. Hodgkinson, for example, remarked (on the 381st page of his "Experimental Researches") that two cast-iron beams took each a permanent set with weights respectively equal to 1.57th and 1.80th of the breaking weight. In a discussion at the Institution of Civil Engineers, a Mr. Dines mentioned that he had tested upwards of 8,000 cast-iron girders for the late Thomas Cubitt, and that he found it hardly possible to apply a weight so small as not to produce some permanent set, 1.20th of the breaking weight producing a perceptible set. In the experiments of the Iron Commission at Portsmouth, a bar of annealed wrought-iron 50 feet long was said to have taken a perceptible set with a weight of less than  $1\frac{1}{4}$  tons per square inch. After this weight had been doubled, however, the set was still only perceptible; and notwithstanding that the elasticity of annealed iron is known to be inferior to that of unannealed bars, the whole set of the 50 feet bar was but the  $\frac{1}{100}$ th part of 1 inch, after a strain of  $8\frac{1}{2}$  tons per square inch had been borne, and the set was but the  $\frac{1}{10}$ th of an inch in 50 feet after a strain of 11.9 tons per square inch. Mr. Edwin Clark has experimented on a wrought-iron bar 10 feet long and 1 inch square. Under a strain of 3 tons per square inch he gives a permanent set of nearly the  $\frac{1}{400}$ th part of an inch in 10 feet. With 8 tons the permanent set is given as about the  $\frac{1}{100}$ th of an inch in 10 feet; and it was not until a strain of 13 tons per square inch had been applied that a set of  $\frac{1}{32}$  inches in 10 feet became apparent. With such exceedingly minute measurements we may, perhaps, doubt if there was really any permanent set at all, with strains under 9 or 10 tons per square inch. An increase of temperature in the bar of perhaps a single degree while the measurements were being made, even under considerable account for some of the reported sets, made under considerable strains. Thus Mr. Edwin Clark gives the permanent set of his bar, after a strain of 8 tons per square inch, as the  $\frac{1}{10000}$ th part of its length, and this is almost exactly what the extension of the bar would have been had its temperature been raised but a single degree between the observations. Iron is heated in the very act of straining it, and a sudden breaking strain will generally leave the broken ends too hot to be handled. Such a slight apparent extension might also have occurred while the shackles by which the bar was strained were coming to their bearings. But even if such a microscopic permanent set really existed, it is one of which no engineer would take the slightest serious notice as affecting the strength of the bar in which it was observed.



## NOTES AND COMMENTS.

THE varieties of the knowledge possessed by SHAKESPEARE have given rise to many essays by specialists. Lord CAMPBELL summed up in favour of the theory that the player was a hanger-on of the law; Dr. WORDSWORTH has discoursed on the orthodoxy of his theology; Dr. PATTERSON testified to his acquaintance with botany and other branches of natural history, and so on. Mr. STOPES, the author of a book on "breweries and malthouses, which we once reviewed, now demonstrates in an essay that SHAKESPEARE knew as much about strong drink as is possible for a consumer. Like HOGARTH, and the poet of the libretto of the opera of "Marta," he believed in the virtues of native beer above all importations. But from the extracts which are given in the essay, SHAKESPEARE apparently was not initiated into the mysteries of brewing and of the adulteration of liquors to suit the palate. This is remarkable, as there is good reason for supposing that SHAKESPEARE was connected with brewing as well as with other unpoetic but money-making trades. BACON also writes about thin and thick potations as a man who was allowed to see the operations of their production, and who tried to form a theory on the subject. In the plays we see evidence that the writer could recognise that beer and wine may be abused, while in BACON there is a more philosophic spirit, as if drunkenness would become to him a subject of study quite as interesting as the gladdening of heart which follows measured libations. It is therefore not unreasonable to conclude from the difference which is seen in the manner of considering drink in BACON's works and in the plays, that the same mind could not have produced them all. But, on the other hand, if SHAKESPEARE knew more or less about malt tubs and stills, why does he write as if he were only a tavern frequenter or a guest in hospitable houses? The writer of the plays was able to utilise scraps of knowledge of all kinds, and why could he not find sermons in malt and grapes as well as in stones? We cannot believe that BACON was a poet, much less a dramatist, and Mr. STOPES's book will help to demolish the new theory; but, contrary to the intention of the author, we believe it will also aid in dispelling the superstition about the butcher's son of Stratford. If, out of compliment to a firm of brewers in Stratford-on-Avon, Mr. STOPES is ready to believe that SHAKESPEARE was a brewer, why is no proof of his calling to be found in play or poem?

THE representatives of Uruguay sought designs for their pavilion in the Paris Exhibition from French architects. The design by M. BARRÉ, of Paris, has been accepted, and he is entrusted with the execution of the building. M. DEBRV, of Amiens, obtained the second prize, M. BRIEN the third, and M. LAIR the fourth prize.

IT is to be regretted that JAMES WYLD, of Charing Cross, is no longer among geographers, in order to point out that the scheme for constructing a colossal globe in the Champ de Mars is no more than a repetition of the experiment in Leicester Square at the time of the Great International Exhibition, when Mr. WYLD was aided by Mr. H. R. ABRAHAM'S skill as an architect. The students of geography had the advantage of contemplating the world from the inside, which was novel, but in Paris there will be no departure from the scholastic use of the globes, except that punishments for not enjoying a dreary study will not be awarded.

THE Belgian Government have now an opportunity of remodelling the Museum of the Porte de Hal, Brussels, and thereby to make the rooms worthy of the country. Hitherto the obstacle to improvement was said to be the conservatism of the curator, M. JUSTE, who held to his own ideas about the uses of a museum. The old fort containing the collections is, as everybody knows, fairly well adapted for holding archaeological objects, although the light may occasionally be insufficient. The Bishop's Palace, which forms a part of the Glasgow Exhibition, might have been suggested by the Porte de Hal. Among the wood-carving, pottery, glasswork, church furniture, armour, &c., in the Brussels Museum, many pieces of great interest can

be found, but it is difficult to realise that any system was adopted in arranging them, and the patience of the archaeologist is in consequence soon overcome. He finds himself wandering about like the ordinary sightseer, and when he leaves the hall he has not found the object he sought. What is needed in Brussels is a curator who can put himself in the place of an archaeologist who is a stranger and who has not time to spare. For his requirements there must be a proper classification of the objects in a museum, and he will need no other clue. There are men enough in Belgium who are competent for the office of conservator, and the best among them should be selected, for HERCULES himself might hesitate before the work that must be undertaken for the transformation of the museum. Advantage might be taken of the opportunity for another purpose. Would it not be well to have a meeting of the curators of archaeological museums at the Musée Royal d'Antiquités et d'Armures, for the purpose of making some approach towards a uniform system of arrangement in the museums of Europe?

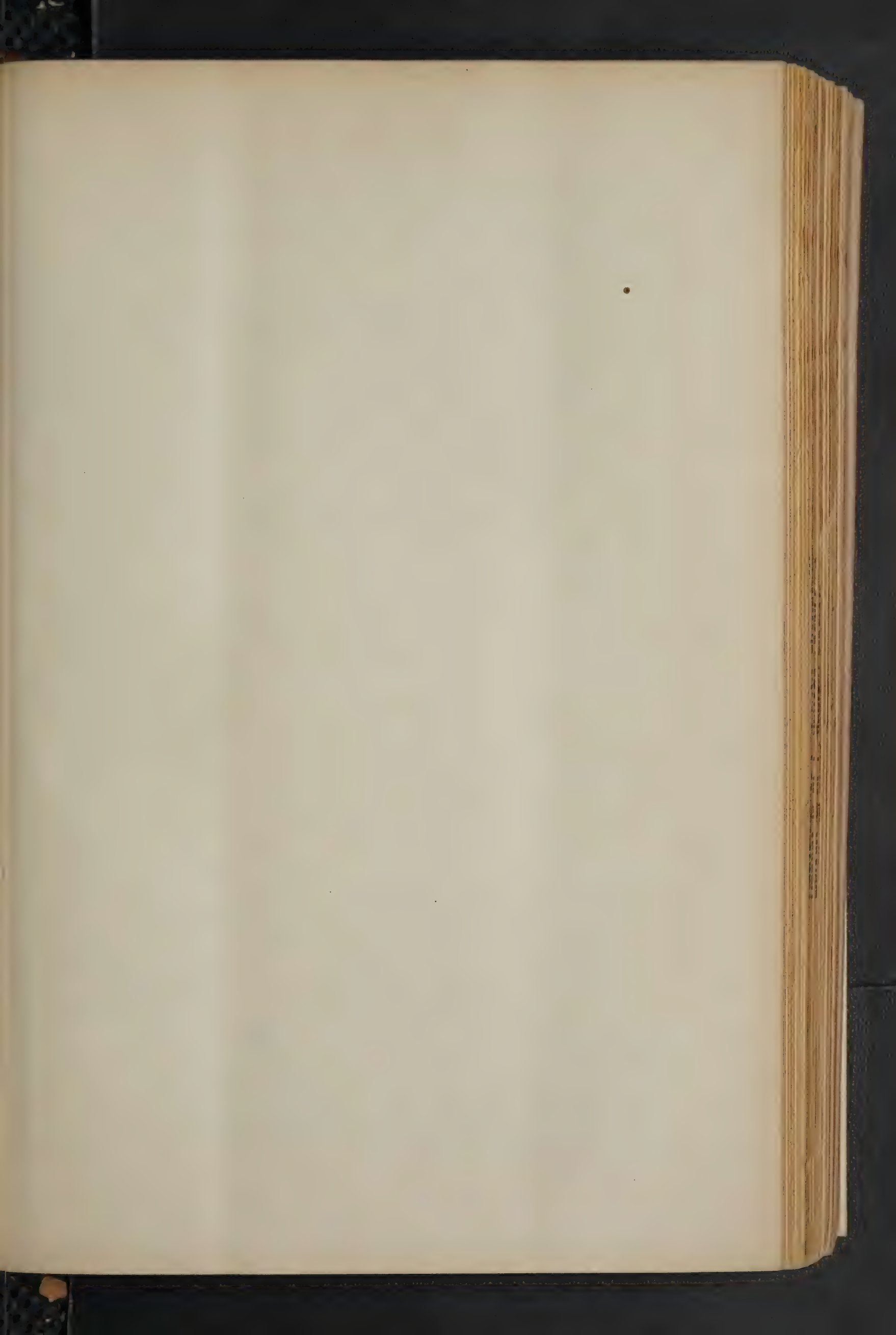
IT is satisfactory to find that in most of the French competitions for memorials an architect co-operates with the sculptor, and has an equal share in the success whenever the design happens to be accepted. The latest instance of the kind is the memorial of the Girondists which is to be erected in Bordeaux. The first prize was obtained by the design produced by M. LABATUT, the sculptor, and M. ESQUIÉ, the architect, and the second prize was awarded to a design by M. DUMILÂ, the sculptor, and M. DEVERIN, architect. The accepted design will probably cost 200,000 francs to realise, and the memorial will be erected in one of the most attractive places in Bordeaux, the Allées de Tourny. The design consists of a sort of Corinthian-Byzantine column, surmounted by a figure representing the French Republic, which is accompanied by a lion. The pedestal will be adorned by sculptured groups representing scenes in the memorable history of the Girondist party during the first revolution.

IT may be safely asserted that few tourists who in the course of their round through Paris visit the Place de la Bastille are aware that the outline of the ancient prison is marked by an arrangement of the paving stones and flags. There is no respect for history shown by the great waggons and vehicles which pass throughout the day over the Place, and in consequence the distinction of the lines is almost abraded. It would not answer if the crowds who will visit Paris next year were unable to trace the site of the Bastille, although a good reproduction of the building may form a part of the Exhibition. Orders have been given to have the paving overhauled, and, as the work is not of great magnitude, there will be no difficulty in restoring the lines.

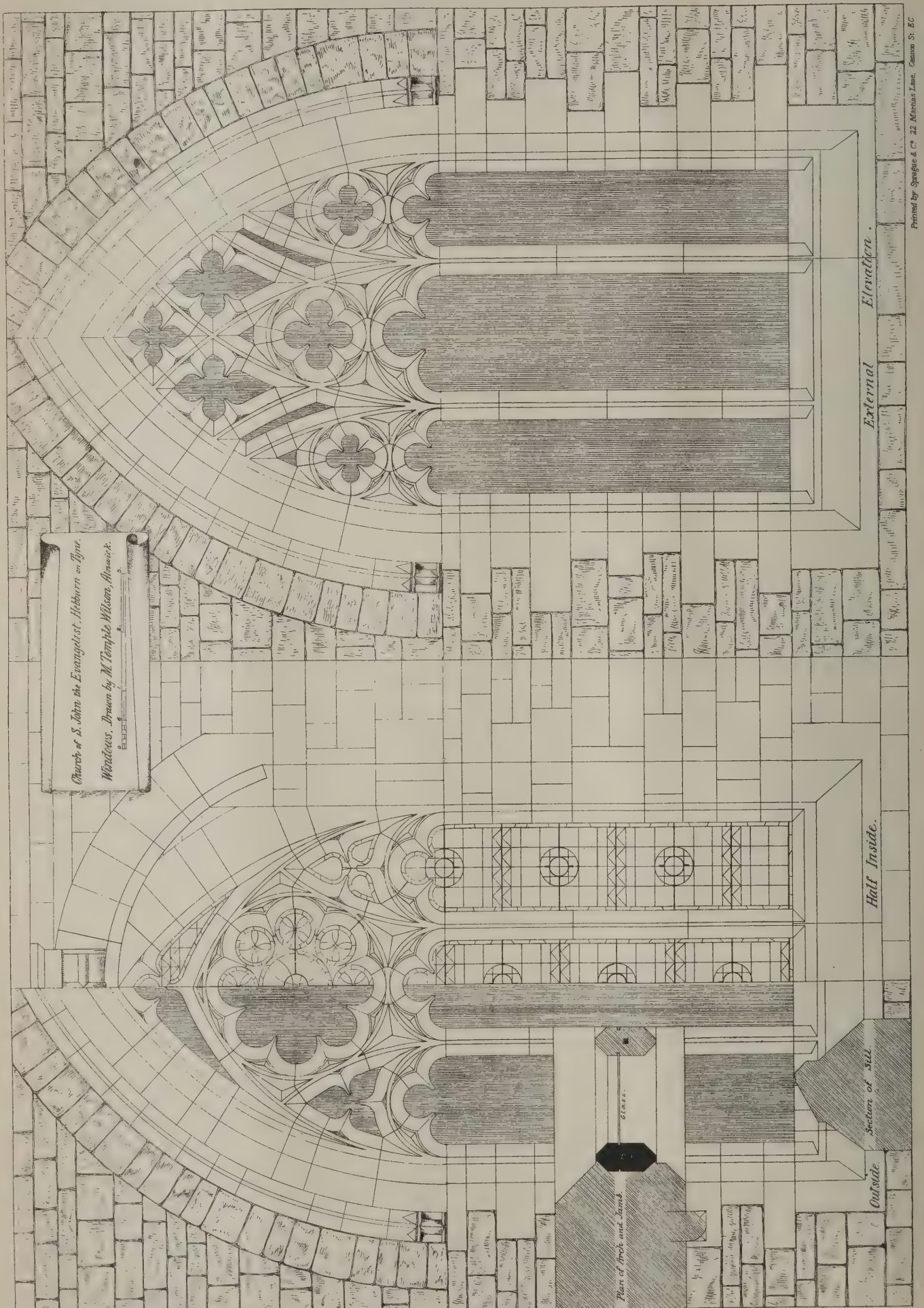
THE chair of Associate Member of the Royal Academy of Antwerp, which was vacant through the death of M. QUESTEL, the architect, is now occupied, as M. HENRI RÉVOIL has been elected. He is among the best known of French architects, and has written some valuable works on his art, especially one on Roman architecture in the south of France. The Antwerp Academy consists of only twenty-five members, and the foreign members cannot be more than ten in number. It was anciently a guild under the patronage of St. LUKE, and was liberally endowed by PHILIP IV. of Spain.

THE furniture of the sheds on the site of the Tuileries having been sold, the sheds themselves will be put up for sale to-morrow. An immediate demolition of them being stipulated, there will be shortly no trace of the temporary post-office which spoiled one of the best parts of Paris. Something will have to be done with the site, as the erection of the contemplated monument of the Republic will need years instead of months. There is no question that the disposition of the place is a most difficult problem. The Arc du Carrousel should be the end of the vista which begins with the Arc de Triomphe in the Champs Elysées, and a great mass of stone placed in front of the former must be an impediment which admirers of the amenity of the city cannot fail to dislike.





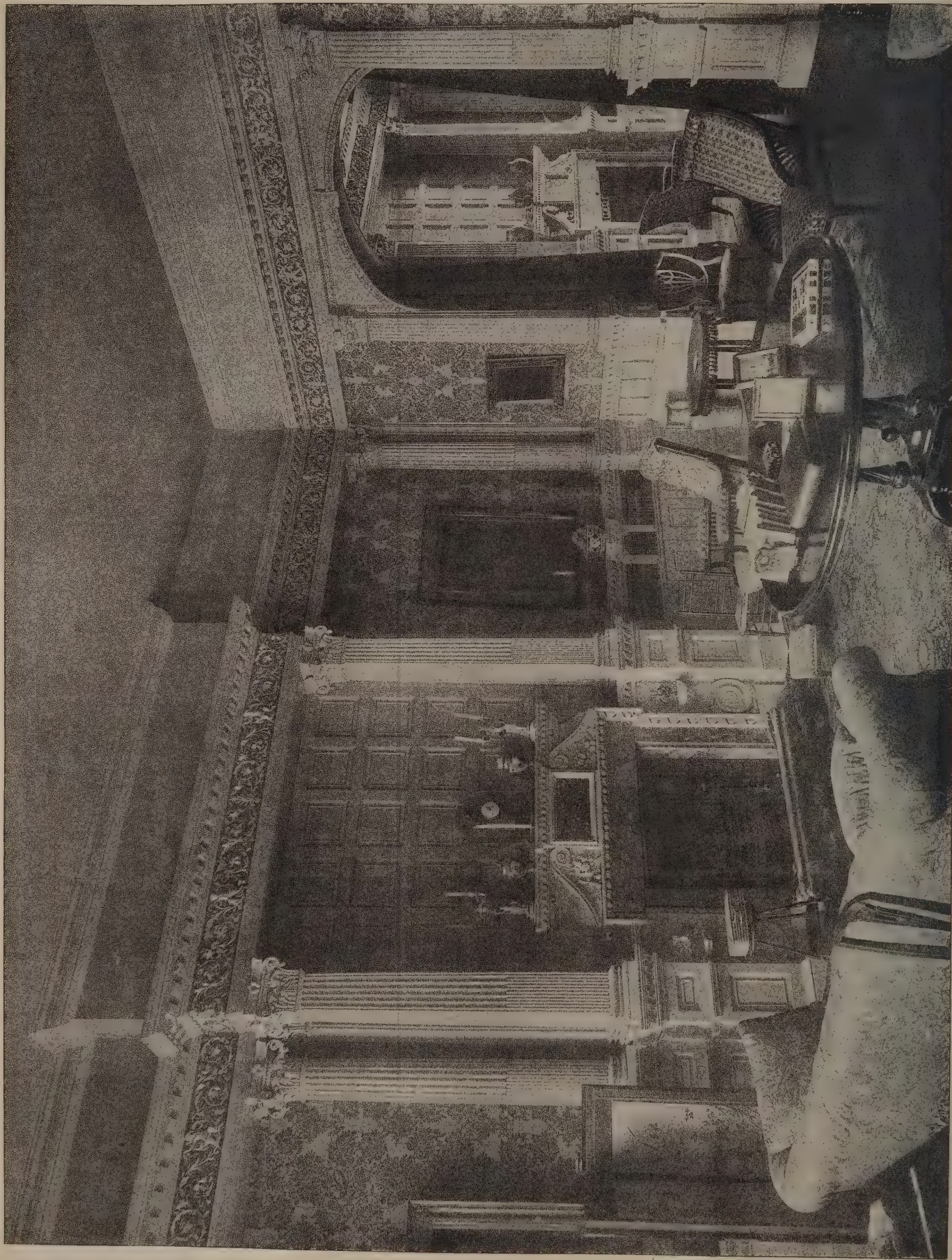








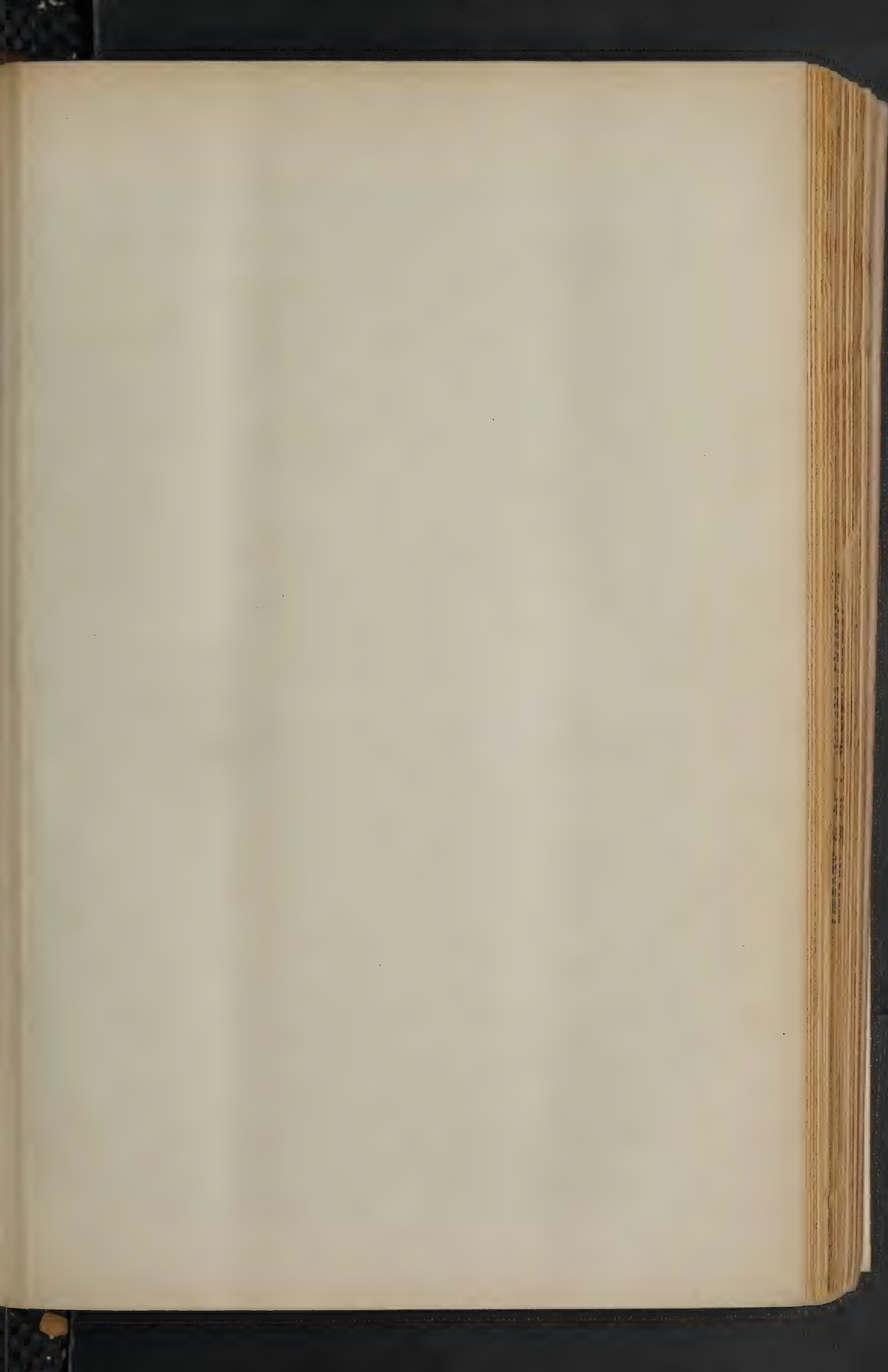




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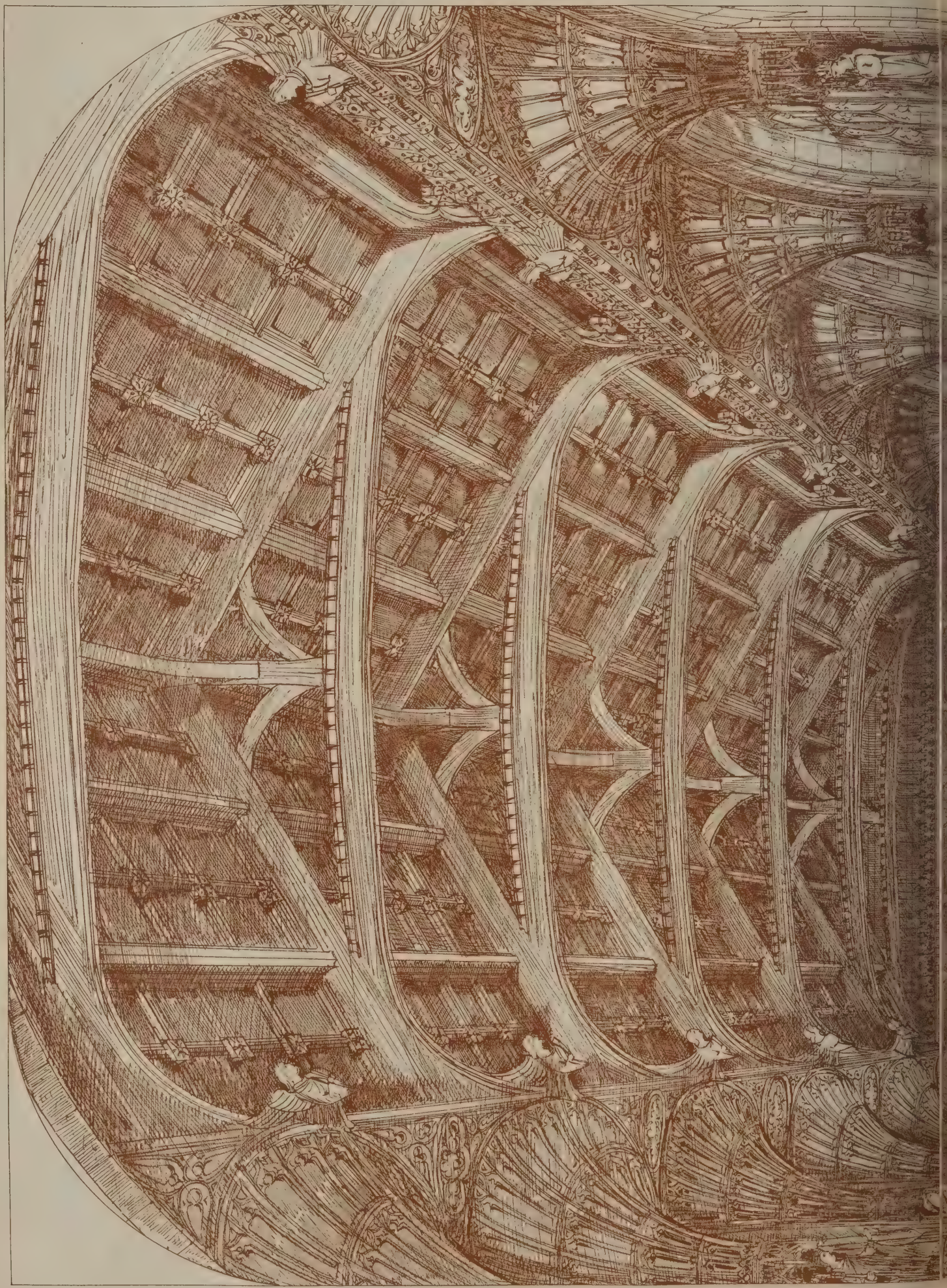
THE DRAWING ROOM - 44 LANCASTER GATE, LONDON.  
HALSEY RICARDO, Architect.



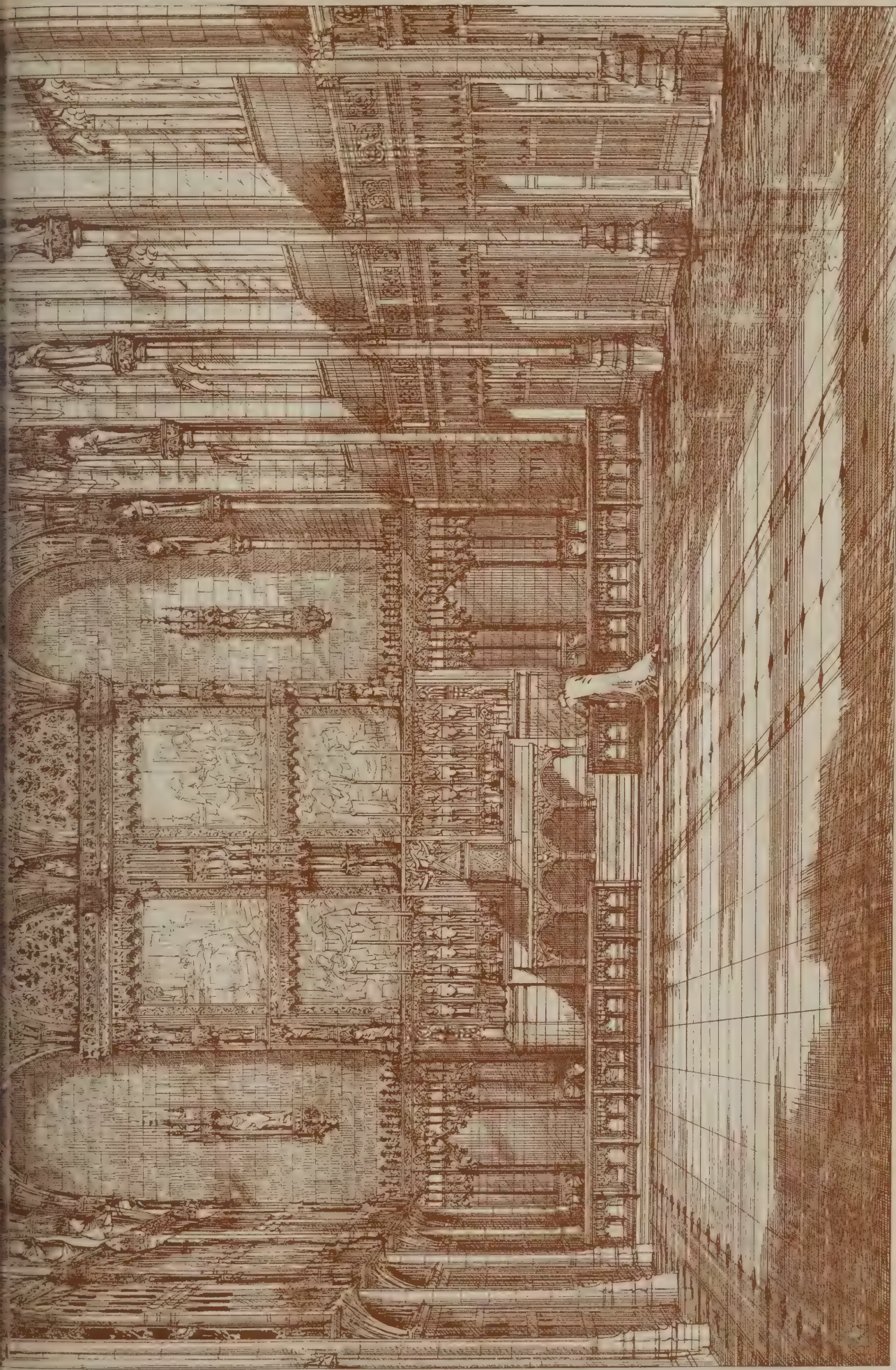




The Architect, Aug. 31<sup>st</sup> 1888.







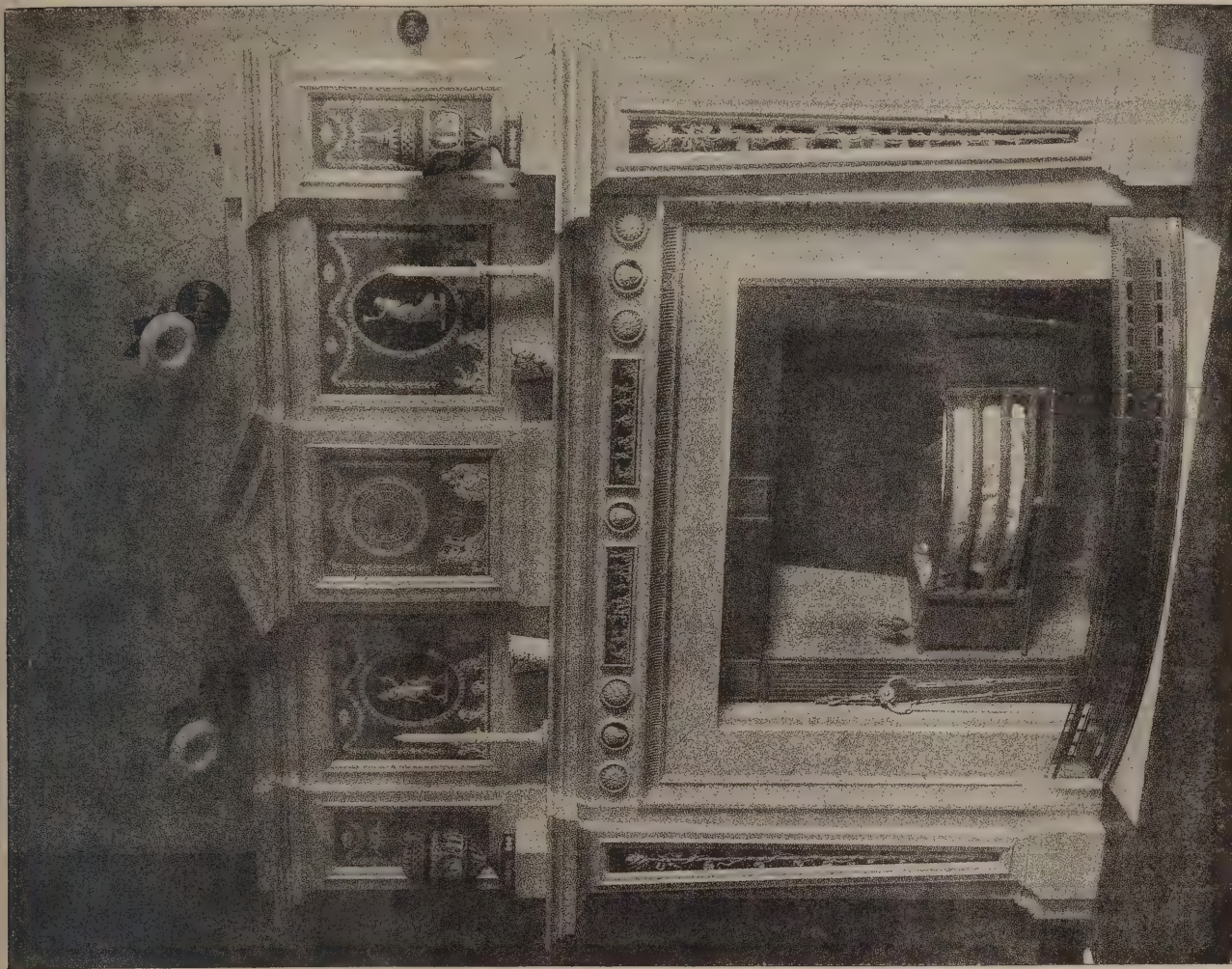
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THE CHAPEL, STONYHURST.  
DUNN, HANSOM & DUNN, Architects

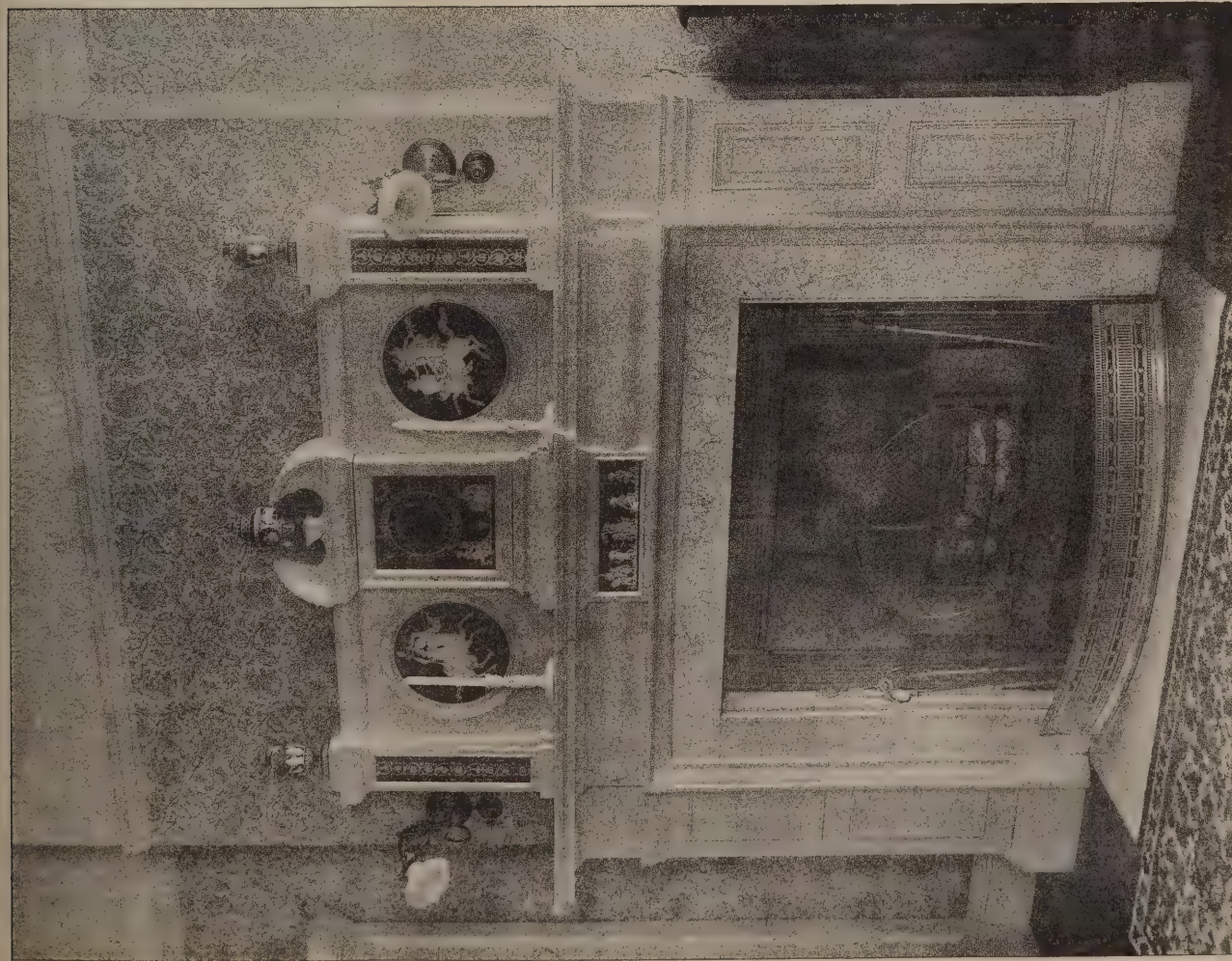








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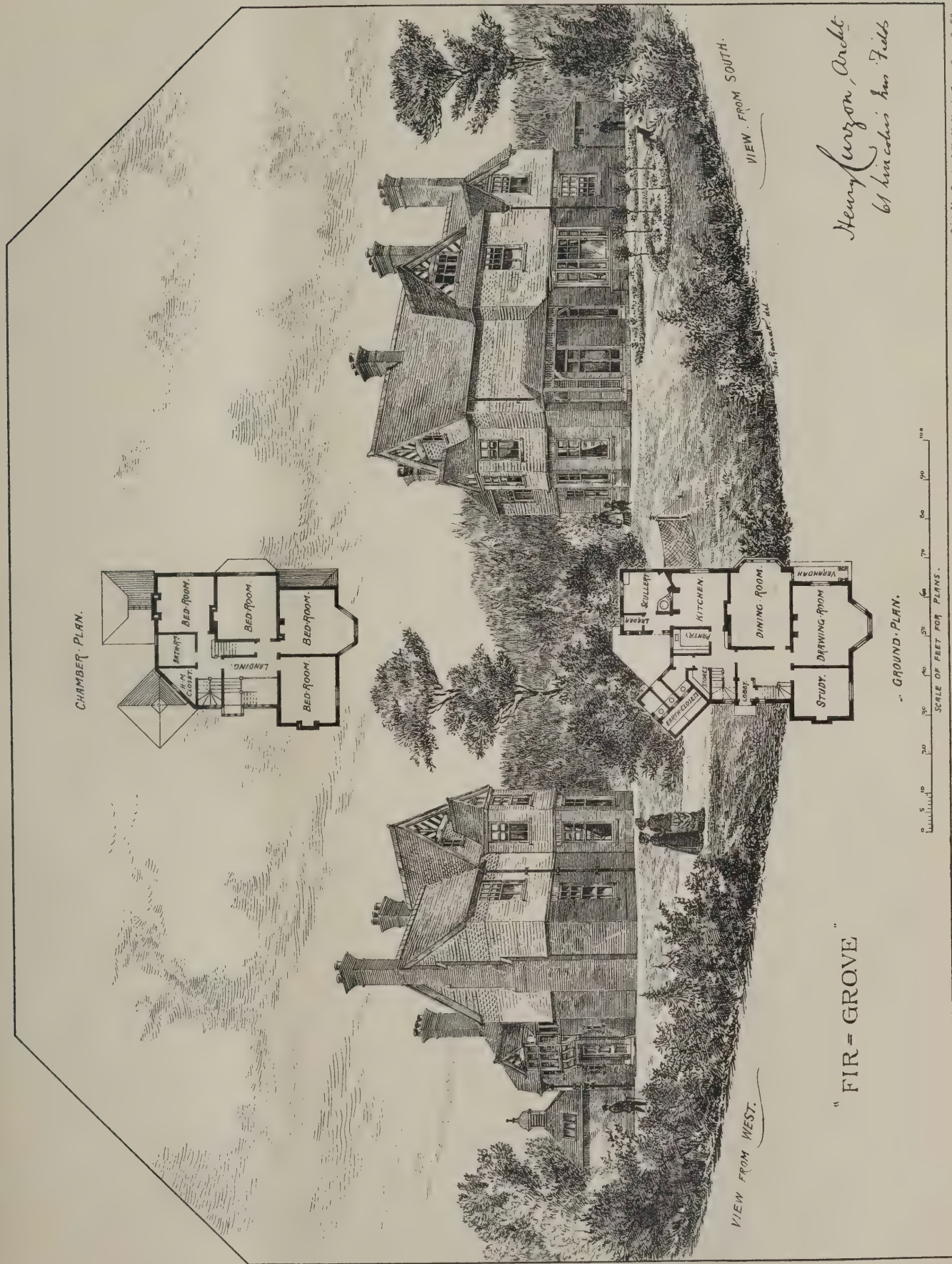
TWO MANTELPIECES—BUCKMINSTER PARK, GRANTHAM.

HALSEY RICARDO, Architect.



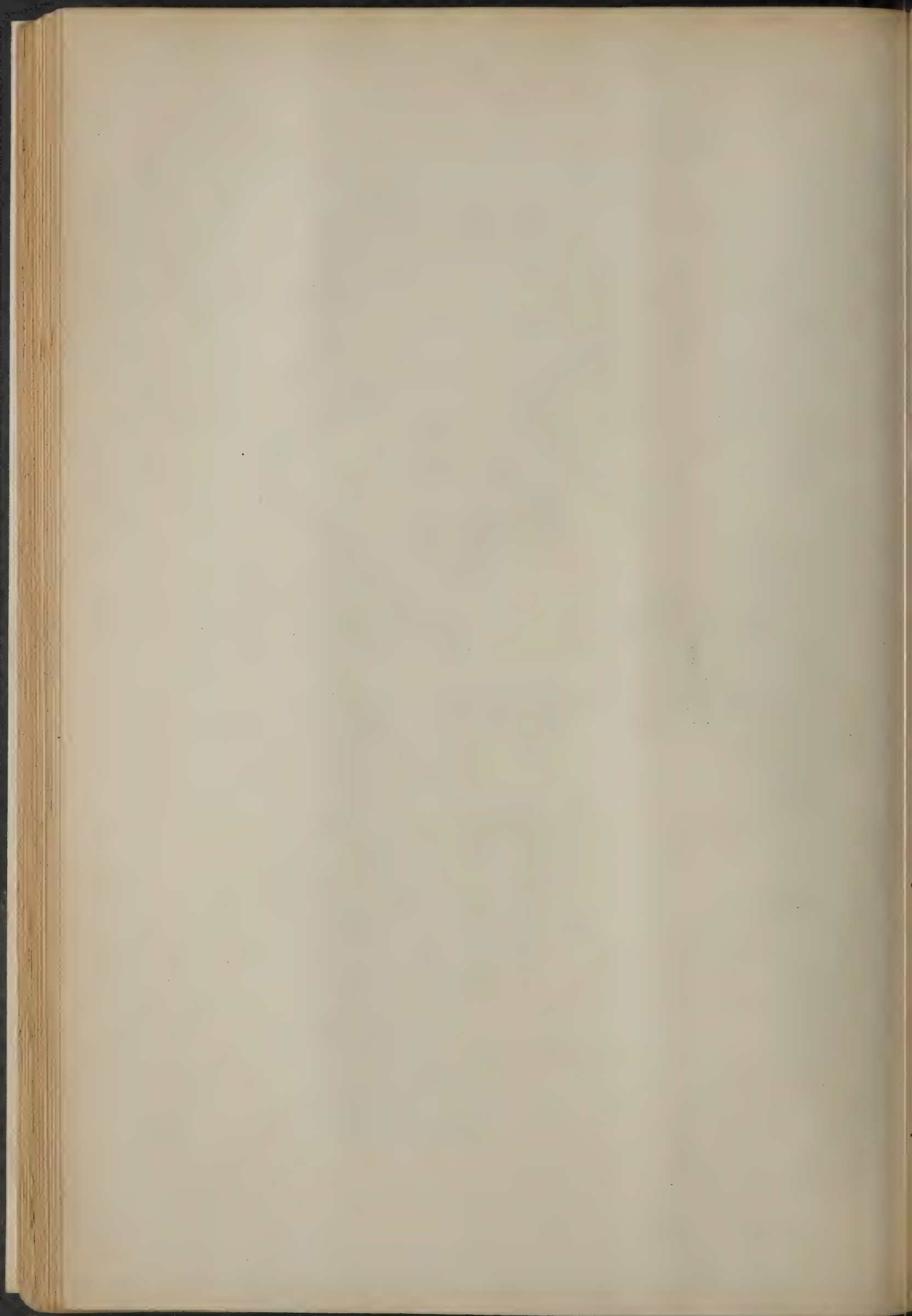






Henry Ferguson, Archt.  
61 Lincoln's Inn Fields







## ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.NO. 14.—DRAWING-ROOM, 44 LANCASTER GATE, LONDON.  
(HALSEY RICARDO.)

NO. 15.—MANTELPieces, BUCKMINSTER PARK. (HALSEY RICARDO.)

FIR GROVE, WEYBRIDGE.

THE arrangement of this house can be deduced from the two plans and views. The hall, which is about 14 feet square, gives access to the three principal rooms. On the ground floor the earth-closets are placed in a way that can offer no inconvenience. In addition to the four bedrooms there are two well-lighted attics. The architect was Mr. HENRY CURZON, 61 Lincoln's Inn Fields, London.

WINDOWS, ST. JOHN, HEBBURN-ON-TYNE.

AN account of the church of St. John the Evangelist, Hebburn, was given lately in this journal. We now give drawings of two of the windows, and more details of the work will be supplied in a subsequent number.

THE CHAPEL, STONYHURST. INTERIOR VIEW.

THIS chapel is being built for the boys, and replaces the present one, which will be utilised as an addition to the libraries. In plan the chapel is rectangular, 90 feet by 35 feet. On one side, under the windows, are confessionals and a sacristy, and on the other tribunes, raised about 12 feet. The latter have fronts of oak screenwork, corbelled out from the face of the wall. A carved dado, of oak, runs round the walls up to the string-course below the windows, which occupy almost the entire wall space on one side of the chapel. The roof is also of oak, of hammer-beam construction, but having the space between the window arches and the hammer-beams filled with fan-tracery groining, surmounted by a carved cornice and cresting. The reredos will also be of oak, with spaces for pictures, and having the top brought forward with fan-groining, corresponding somewhat with that of the roof. This building is part of the new college designed by Messrs. DUNN, HANSOM & DUNN, architects, of Newcastle-on-Tyne.

THE BRITISH ARCHÆOLOGICAL  
ASSOCIATION.

THE annual Congress of this Association opened in Glasgow on Monday, when the members and visitors were received in the City Chambers. The Lord Provost, in welcoming the party, expressed his pleasure that so many had found it convenient and agreeable to pay a visit to so ancient a city. When he spoke of its ancient character he was afraid that the relics of antiquity were but few in number; but their programme included visits to prehistoric forts, to the Roman wall of Antonine, and to the Roman camp of Ardoch, also to the interesting antiquities of Bute, where they would have the opportunity of enjoying the hospitality of the Marquis; the two battlefields of Bannockburn and Langside, the palaces of Stirling and of Linlithgow, the castles of Bothwell and of Craignethan; and last, the members would find in the grounds of the Exhibition a collection of the rarest and most valuable treasures of an antiquarian character, many of which have never been shown before.

Sheriff Berry said he could add little to the remarks made by the Lord Provost. No doubt the present city did not externally bear many marks of antiquity. It had grown to be a great mart of trade and manufacture; but still in its early history it was well known that for a long period Glasgow was simply the burgh of the Bishop or Archbishop of Glasgow. They were to have from Mr. Honeyman, a master on the subject, an explanation of the architecture of the cathedral, which carried them back to the early history of this city. They were also to have a paper on the history of the see from the Archbishop of Glasgow, and that could not fail to throw a great light upon the early history of the city.

Mr. John Honeyman, as president of the Archæological Society of Glasgow, said he had to offer them on behalf of the Society he represented a most cordial welcome to Glasgow. The Lord Provost and the learned Sheriff had spoken more exclusively on behalf of Glasgow, but his Society included a somewhat wider area. He was glad to think that so many

members had volunteered to assist them on the present occasion, to read papers on the various places of interest which were to be visited outside the boundaries of the city. He need hardly say that the visit of the British Archæological Association to that part of the country had been matter of great interest to the members of the Glasgow Society. They were all sensible of what must be the feelings of archæologists, that one of the needs of the present time was a closer association of the various societies.

Mr. Morgan, hon. treasurer of the Association, in the absence of the president, the Marquis of Bute, thanked the Lord Provost and the other gentlemen for the kindly reception they had given the Association on its first visit to Glasgow.

The party then proceeded to the Park Buildings, Langside, where Mr. A. M. Scott detailed the incidents of the battle fought by Mary, Queen of Scots, on May 13, 1568, against the Regent.

Proceeding to the memorial below the park, and at the entrance to the village of Langside, the ceremony of inauguration was gone through. The cathedral was next visited, where Mr. John Honeyman, F.S.A. Scot., read a paper on the history and architectural features of the building, which will be found in another part of our issue. A public dinner at the Grand Hotel, Charing Cross, finished the day's proceedings, the Sheriff of Lanarkshire, Dr. Robert Berry, and a vice-president of the meeting, being in the chair.

After the usual loyal toasts, the Chairman gave the toast, "The British Archæological Association." In the cathedral, he said, Glasgow possessed a building of which the citizens might well be proud. They in Glasgow were glad to think that the spirit of their ancestors was such as to prevent the demolition of that cathedral when, unfortunately, too many ecclesiastical ornaments in Scotland were destroyed. It was not the only cathedral which Scotland possessed in a practically intact condition. He was fortunate enough the other day to visit the cathedral of St. Magnus in Kirkwall—a building, he believed, still more ancient than the cathedral of this city, but one, he was afraid, rather too remote for the Association to visit. They had in Glasgow a building which antiquarians would delight to visit, and which the citizens naturally prized as a great feature of this city. Apart from the cathedral itself, the history of the city was also worthy of the study of antiquarians. The history of the city, or rather burgh, as it was for a number of centuries, dated from about the date of the cathedral itself, which was, he thought, about the end of the twelfth century, in which the first charter was given to the Bishop of Glasgow. Without wearying them with a history of the city, he just wished to say that for nearly 400 years the burgh of Glasgow flourished under the bishops and archbishops, and it was to the fostering care of those high dignitaries that this burgh, or ultimately city, owed its first beginning of success and prosperity.

Mr. Thomas Morgan, F.S.A., briefly replied.

Mr. Arthur Cates gave "The City of Glasgow." He considered Glasgow was justly entitled to the name of the second city of the empire. They had there the great cathedral, happily preserved, and the great university from which so many students issued forth to make Scotland's name respected throughout the world. These two buildings, representing the Church and religion of the country and its progress and learning, were two of the greatest monuments of this great city. Then Glasgow had the two tallest chimneys in the world, and every one of them looked on these great chimney-stalks with admiration and respect, as emblems of the great power and might of the men who had raised them, and as typical of the great power and wealth of this nation. Perhaps the greatest monument that the city possessed, if it could be called a monument which was ever flowing on, was that which had been practically created by the city, and which had created the city in return—he referred to the river Clyde. He would recommend all who had the opportunity to walk along its quays and its docks, to take boat and look at its great shipbuilding yards, and to consider what energy, what perseverance, what might of mind and of money had been required to convert the Clyde of the past—that stream which in the memory of man had been forded at the Broomielaw—into the mighty waterway for commerce which it now was. It was not simply a glory to Scotland—it was a glory to the whole nation that under such disadvantages a port should have been created which had exercised so much influence on the commerce and wealth of the empire. Of all the cities in the empire he knew none in which architecture had been cultivated with so much care and practised so successfully as in Glasgow. The streets were broad and magnificent; and if they had the tallest chimneys in the world he thought they had also the longest streets, and therefore were distinguished in two particulars. They had also some of the finest buildings, admirably placed and admirably built. If he might refer to one example, he might say that the church in the north-west suburbs, treated in the Roman style of architecture, appeared to him to be one of the best in its arrangements and its execution of any Classic period. Then recently the post-office had been erected in the centre of the city, facing



the square in which it was no doubt the aspiration of many of Glasgow's citizens some day to hold a place in marble or in bronze, and where the great Wizard of the North took his stand, and worthily ennobled it, because to them in the South he was the discoverer of Scotland. It was he who bade them go North, and who gave them the greatest interest in every loch and every castle throughout the country; and to him Glasgow owed much, because if their presence there was worth something it was he who had brought them there. Then the municipality had distinguished itself by erecting a grand municipal block, a block reflecting credit on the city and on the architect.

Sir James King, having replied, other toasts were given to the local executive and the chairman.

#### ST. MARY'S, STRATFORD-ON-AVON.

AN excursion was made by the Worcester Diocesan Architectural and Archaeological Society on Friday to Stratford-on-Avon. Amongst other buildings the church was visited, where Mr. Oliver read a short paper on the history of the building, and was followed by Alderman Noake, who stated that the work of restoration at present accomplished there included the entire repair of the external fabric, which had been carefully carried out on the lines laid down by the Society for the Protection of Ancient Buildings, also the removal of the galleries, rearrangement of the seating, the strengthening of the tower by iron ties, and adding new bells. The next work to be done was the opening of the transepts and removal of the organ to a situation not yet decided on. There had been a delay in the work of restoration which was unaccountable, for with such immense sums as were supplied by visitors from all parts of the world, there ought to be no difficulty in carrying on that work even without any appeal to the inhabitants of Stratford or the public at large. In the Middle Ages the pilgrims to the shrine of St. Wulstan enabled the prior and monks of Worcester to rebuild, enlarge, and repair their venerable cathedral, and so to hand it down to all succeeding ages, and why should this not be the case at Stratford, where the receipts from visitors would seem to be far in excess of what was required for the restoration of a comparatively small church?

#### SANITATION OF TOWNS.

AT the meeting of the Association of Public Sanitary Inspectors of Great Britain, at Brighton, on Friday, Dr. B. W. Richardson read a paper by the president, Mr. Edwin Chadwick, C.B., dealing with the progress of sanitation and the results. In the course of his address he said:—Examining the reports sent to me of the work done in a number of towns, and comparing them with each other, looking particularly at the work done by the sanitary inspectors under the direction of the health officers, as to the number of houses in a bad sanitary condition which have been improved under their direction, and as to the accumulations of putrefying matter which they have removed, it is certain that a large share of the reduced death-rate is due to their service—imperfectly as it is yet organised and obstructed as it still is. Looking, however, at the extraordinary recent reduction of the death-rate in the metropolis (where it was not long since 24 in 1,000, but has recently come down to 14 and 15 in 1,000), I cannot but consider that much of that reduction must be due to climatorial causes. On the occurrence of a great thunderstorm, immediately after it has cleared away there is an experience of a new and fresh atmosphere. It has done for a time what must be the constant work of good sanitation.

Good sanitation will, however, do more than that permanently. By the Consolidated Metropolitan Sanitary Commission—which had charge of the whole of the house drainage, as well as the drainage of the roads, and also of the land drainage of the suburbs, plans based upon trial works of blocks of buildings, which trial has since been verified by the results of work in a number of towns where the system of "circulation *v.* stagnation" is followed—constant supplies of pure spring water would by this time have been carried into every house, or on to every flat in every house without cisternage and stagnation and de-aeration. The foul water would have been constantly carried out of every house by self-cleansing house-drains and sinks into the self-cleansing sewers of the streets, and from those self-cleansing sewers on to the sewage farms or gardens fresh, and without loss of strength by putrefaction. What would have been the grand result of this system is indicated in towns more or less completely on the separate system, for in those towns there is a reduction of the death-rates by fully one-half. And there can be no reasonable doubt that all of the like reductions might have been effected on the same principle in the metropolis and in other cities. It is too

long a story to describe the combination of sinister interests in expensive Parliamentary procedure and in expensive works by which the Government were put in a minority against the continuance of the first General Board of Health and of the Metropolitan Sanitary Commission. By that first General Board of Health local authorities and executive officers were distinctly warned that they were responsible under the old common law categories for acts of "nonfeasance," of "misfeasance," and of "malfeasance."

If an architect or a contractor supplied with a good plan, and with the latest improvements before him, were from *mala praxis* to construct an edifice with a large stagnant cesspit beneath productive of disease to the occupants, he would certainly be liable in damage for his malfeasance, and it admits of clear proof, from what has been done in various other towns, that, had the works on the plans prepared been fairly in the metropolis executed, the metropolitan death-rate would at this present time be reduced by at least 5 in 1,000, and would probably have stood at 12 in 1,000 from the year 1856. Instead of being in its condition, the river would have been purified first instead of last, and the river itself would be pure instead of being in a condition which Lord Bramwell's Commission described as "a disgrace to the metropolis and to civilisation." It appears to me to be of importance at this time to display, in the way of warning, the wholly unimagined and gigantic extent of evil of sanitary "malfeasance" in the results on the metropolis, the cost in lives, and of the money value in lives chargeable and inflicted on the metropolis *mala praxis*, and by "malfeasance." As to the value of the lives, I take the estimate of Dr. Farr in relation to the average actual cost and the average actual value of every human being in England at 159 $\frac{1}{2}$ l. The total loss of lives every day has been 98, and the loss of them in money value has been every day 15,523 $\frac{1}{2}$ l. Every week the average total loss of lives has been 685, and the total loss in money 108,963 $\frac{1}{2}$ l. Every year the total loss of lives in the metropolis has been 35,636, and in money 5,666,059 $\frac{1}{2}$ l. Such will be found to be the rate of the cost of the delay of the practical application of the power of sanitary science in competent hands for the future.

I submitted these results to Lord Herschell as charges for investigation under the Commission for the examination of the working of the vestralised Metropolitan Board of Works. No doubt the discrimination of cases would have been difficult between the individuals who were, we must assume, utterly unconscious of what they were being made to do, and those who were not, or who, in ignorance of the *mala praxis*, nevertheless could not now equitably be subjected in such penalties as would have befallen them from the judges of old. No doubt also the investigation would have been laborious and difficult, yet it would have been useful for the public instruction and for the future warning to local administrative authorities. But as the proved acts of malfeasance in comparatively small matters have served in the mind of Parliament, as well as of the public, for the discontinuance of vestralised authority in such matters, it seems to have been considered unnecessary to enter into the examination of such large and complicated inquiries. It is nevertheless of vital importance that the powers of the great factors of sanitation should be vindicated and shown to be so certain, from what has been done, that a capitalist would be safe from proof of a reduction by one-half of a death-rate in contrast with a reduction of one-third. A contractor, with enlarged and commensurate powers, might contract for the reduction of the excessive death-rate of Manchester—now 27—to 16 in 1,000. And this reduction would be attended, as shown in the manufacturing town of Leek, with an augmentation of five years of the average duration of life and working ability. And at what cost? At not above one-third of the insurance charges of the 24 millions of money annually paid by the wage classes of England to provide against excessive sickness and premature mortality; nay, I believe at not above one-third of the insurance charges against sickness and mortality enforced by a special executive machinery made by Prince Bismarck in Germany.

The sanitary works of drainage and improved water carriage are, however, sometimes countervailed by overcrowding. Let us look at the case of the working-man under that condition. In some experiences got out at Glasgow, it is there shown that there is an excessive death-rate in single-roomed tenements, but a lower death-rate in double-roomed tenements, and a still lower death-rate in the three-roomed tenements. Increased living-room space must be paid for, and is it not worth while for the mechanic who is getting his 25s. a week to pay 2s. or 3s. a week more for such space as he may get in a model dwelling, in which it is proved that on an average he obtains full ten years more of life and working ability? Compare this with the fate of a man who emigrates to a city in the United States, or to one of the Australian colonies, where the death-rate is 27 in 1,000, and who will lose by one-third his chances of life and working ability, and, if he have a family, will see one-half of his children in their graves by their fifth year. I deem the greatest gain of sanitary science developed



since we last met here the proofs obtained of the power of the prevention of the chief of the children's diseases. In the large district schools, the districts of the Poor Law unions, the children's chief diseases are now practically abolished. Those institutions may be said to be children's hospitals, in which children, orphans of the lowest type from the slums, are taken in large proportion with developed diseases upon them, often only to die from constitutional failure alone. Yet in a number of these separate schools there are now no deaths from measles, whooping-cough, typhus, scarlatina, or diphtheria. The general death-rate is about 10 in 1,000, and of those who are not in the probationary wards, of those who come in without developed disease upon them, the death-rates are now less than three in 1,000, or less than one-third of the death-rates prevalent among the children of the general population of the same ages. To illustrate this progress of the chief rudimentary and sanitary factors, I may give one example of an institution where the old death-rate was the common outside one of 12 in 1,000. The institution was first properly drained, and the premises cleared of foul sewage smells, by which clearance the death-rate was reduced by more than one-third, or to 8 in 1,000.

Since last we met there have been, as it appears to me, most important advances in the improvement of ventilation. In some district institutions stoves have been introduced which bring in constant supplies of fresh air, warm it, circulate it, and carry out the vitiated air. Dr. Richardson in his own large library has used one, a calorigen, which introduces fresh air, warms it, and constantly discharges the vitiated air, keeping the room all over at the temperature he requires. Sir Spencer Wells informs me that he uses one for each bedroom. In one hospital some forty are used. But Dr. Bond, the eminent inventive health officer of Gloucester, has invented one; to which the Sanitary Institute has given a prize, as for a very material improvement, and now comes out another adapted to large edifices, used and approved by General Webber and worked by Mr. Green, the material part of which was invented by Mr. Maxim, the great American inventor of the new army gun. I have had the working of this stove examined at the new Courts of Justice, and it is reported to be completely satisfactory, and also on shipboard at the German Lloyd's. It appears to be well adapted for the large schools, where the states of the atmosphere are denoted by the fact that the death rates among the teachers are fourfold those of the Royal Navy on the home stations.

There is yet another great promise of sanitation, of the abolition of foul soot, and sooty fogs, and the reduction of the clothes-washing bill of the metropolis, which I estimated twenty years ago at 6,000,000*l.* At Pittsburg, New York, the steam power is worked by gas. In Manchester the working of steam-engines by gas is now offered at two-thirds of the price of working them by the wild flame of coal, and, when the municipality has charge of the gasworks, they may supply the houses with the internal apparatus and heating power at a rent cheaper than warming by coal. There is also promise of the extensive distribution of power by electricity. Experiments recently made at Oerlikon, near Zurich, have demonstrated the possibility of distributing power economically by means of electricity. The power of a water-wheel at Kriegstettin has been delivered at Solothurn, distant about 75 miles, and the net power delivered amounts to 75 per cent. of the power supplied by the water-wheel. I must conclude my too long survey of what I consider to be the chief advances in sanitation since the last congress held here, with thanks for your attention to them.

### SCOTTISH BROCHS.

THE following description on the subject of Scottish brochs is from a correspondent of the *Glasgow Herald*:—"These structures are invariably round in form. One cannot examine many of them without being struck with the remarkable similarity of plan which shows itself amid occasional slight differences. Externally the structure presents the appearance of a truncated cone having no windows looking to the outside, the only opening being a doorway, which gives access through a passage to the central chamber. There are, as a rule, two concentric walls distant a few feet from one another at the level of the ground, and usually sloping towards each other so as to meet at the top. In some instances, however, the two walls form one solid mass for at least a part of their height. Dr. Wilson, in his 'Prehistoric Annals of Scotland,' thus describes the arrangements in the space between the walls. Within this space 'a rude staircase, or rather inclined passage, communicates round the whole, and a series of chambers or tiers of interspaces, formed by means of long stones laid across from wall to wall, so as to form flooring and ceiling, are lighted by square apertures looking into the interior area.'

There is scarcely any doubt that this central area was open to the sky. Had it not been so, the square openings just referred to would have been useless, since in no other way

could light be admitted into the galleries in the wall. In Sardinia there is a class of very ancient structures resembling in some respects the Scottish broch, though in other respects differing from it. These are the nuraghes, of which there are said to be three thousand on the island, chiefly in the inland parts. The nuraghe, like the broch, is circular, and has, like it, a central chamber and a staircase, but the resemblance ends here. The special feature about the broch which distinguishes it from the nuraghe is the presence of the wall chamber, to which access is had from the central court, and also from the passage leading to it. These chambers occupy spaces in the thickness of the wall, several of them being found in each broch. They commonly vary, however, in number and dimensions in different structures. These chambers are roofed in the so-called bee-hive manner, *i.e.*, the horizontal courses of stone forming the sides of the chamber are each made to project slightly beyond the course below, so that the four sides gradually approach one another near enough to allow the space at the top to be covered by one or more flagstones.

Brochs are, as a rule, surrounded by various other structures, usually at a distance of several yards, though both the distance and the character of the structures vary in different examples. These outworks generally consist of masses of masonry enclosing passages and chambers, while a solid wall in the form of a rampart occasionally surrounds the broch. There is reason to believe, however, that all such outworks belong to a secondary occupation of the site, and have a date considerably posterior to that of the brochs themselves. The same may be said of erections which are often found inside the main building, in the form of a wall, usually about 8 feet high, running round the face of the inner wall, with or without stone partitions built across the central area. These additions were probably made by later occupants as part of a plan to cover over the court as a place of shelter from the weather.

A feature of note about these towers is the absence of mortar in their construction. This is an invariable characteristic. Mud or moss may have been used to fill up crevices between the stones, but certainly no trace of cement has ever been discovered. After the excavation of the broch of Carn Liath, near Dunrobin Castle, in Sutherland, a year or two ago, some mortar was used to prevent the further ruin of a wall—a circumstance which may puzzle antiquaries a few centuries hence. Oldwick Castle, an ancient keep overlooking the Bay of Wick, may in some respects, notably in having chambers in the thickness of the wall, be compared with the broch; but the presence of the mortar in its construction shows that it belongs to a later civilisation. Since cement was unknown to the broch-builders, it followed that to produce strength recourse had to be had to great thickness of wall. A thickness of about 14 feet is frequently to be met with, but in different examples the wall varies in this respect from 9 feet to 20 feet. The central court also varies considerably in diameter, 33 feet being a usual measurement. In several brochs a well with steps leading down to it has been found within this central area. In some instances these wells were dry at the time when the broch was freed from rubbish, but more than once water has been found in them.

In Kettleburn broch, in Caithness, explored by the late Mr. Rhind, a spring of clear water was discovered, which is still used by the cottars in the neighbourhood, whose houses have been built from stones taken from the broch. Time, aided by man, has done much to demolish these ancient structures. In some cases they have become so ruined as to appear in the form of green mounds, with merely a stone projecting here and there. Indeed, the very memory of them has sometimes perished, and their existence has been only revealed by the ploughshares, as in the case of the broch at Hunton, in Orkney, which was entirely concealed beneath the level of a cultivated field. The dun of Carloway, in the Island of Lewis, situated about eight miles from the famous standing stones of Callernish, remains, in part at least, tolerably well preserved. In Glenelg, opposite to the Island of Skye, there were formerly four brochs, built, according to a local tradition, by a mother for her four sons, who were named respectively Malcomb, Chonil, Telve, and Troddan, the towers being called after them. Of these brochs the first two were almost entirely demolished before the beginning of last century, but the other two still show a good part of their original height. In 1720, when Gordon visited Glenelg, only half of the circumference of Castle Telve remained. Pennant, who examined it some fifty years later, found that the height of the remaining part was then about thirty feet. Several years before, he remarks, "some Goth purloined from the top 7½ feet, under pretence of applying the materials to certain public buildings." He is of opinion that the structure had formerly been about 40 feet in height.

There is another famous broch in the north which still shows, even in its ruins, the marks of its former greatness. This is Dun Dornadilla, in Sutherland, situated about seven miles from the north coast, close to the southern slope of Ben Hope. This broch, according to an ancient legend, was built by a king, Dornadilla by name, who died about 230 B.C.—a



tradition which may be accepted for what it is worth. The walls are now somewhat under 30 feet in height, the entire structure being about 50 yards in circumference. In some respects the most noteworthy of all the brochs is that of Mousa, situated on an island of the same name off the mainland of Shetland. From its isolated position, it has escaped the pillaging zeal of persons apt to mistake interesting remains of antiquity for convenient quarries. The present height from the level of the ground outside is 41 feet, and from the floor of the central court about 45. The feature of the building of special interest in addition to the exceptional height of the walls is the circumstance that, when seen from without, the structure has a shape somewhat resembling a dice-box. The bulging out of the wall towards the top, which produces this effect, is believed to be due to weathering, and not to have formed part of the original plan. The diameter of the building is 49 feet, that of the central court 20 feet, and that of the wall 14 feet 6 inches. There are six galleries, varying in height from 4 feet to 5 feet 6 inches. The stair which gives access to them is still in fair preservation. In the thickness of the wall there are three chambers, having entrances from the central court. The largest of these measures 16 feet in length, 5 feet 9 inches in breadth, and 9 feet 9 inches in height. The doorway, which leads through the passage to the central area, is 5 feet 3 inches high, with a breadth of about 3 feet. About half-way along this passage are to be seen the projecting jambs formed of upright stones, behind which in former times a door, in the shape probably of a rude wooden shutter, was fixed. There are, however, no signs of the bar holes behind the jambs, so common in other brochs, for the insertion of a long stone to strengthen whatever was used to barricade the entrance. Mousa has certain romantic associations connected with it. Twice in its history—first in the year 900 and again in 1154—was it the retreat of runaway couples who sought shelter within its walls. The broch of Clickemin, close to the town of Lerwick, stands on a little island in a small lake beside the sea, and is reached by a series of stepping-stones. Brochs, as a rule, are to be met with near the sea margin or on islets close to the shore. When a chain of them ran inland for several miles, they were probably used as beacon towers for signalling purposes. A good example of such a series of brochs is to be seen in Strath Brora, in Sutherland, beginning with Kintradwell on the coast, and ending with Caisteal-Coille, or the castle in the wood, some 20 miles inland.

Within recent years systematic attempts have been made to discover what can be learned from a careful examination of the brochs themselves. By the help of funds derived from the Rhind Bequest, much good work has already been done in this direction. Under the superintendence of Dr. Joass, of Golspie, and other antiquarians specially interested in the subject, various brochs have been thoroughly examined, and a list has been made of the objects which were brought to light during the progress of the work. In many cases brochs, after they had become ruined, were used as places of sepulture, and both ornaments and weapons were thus introduced at a later date among the materials of the ancient buildings. There can hardly be any doubt that brochs were originally intended as fortresses for occasional occupation, though afterwards frequently used as places of residence. The idea, which was formerly more common than it is now, that they were built as the palaces of kings or chieftains, has little to recommend it, since several of them occur close to each other within a very limited area of country. Still less likely is the theory, now abandoned, that they were built as temples. Their position, for the most part near the coast, seems to indicate that they were meant to afford shelter from the attacks of sea rovers. From their construction they were well fitted to be places, not of offence, but of defence. As Dr. Joseph Anderson puts it, "The broch is the architectural embodiment of passive resistance." The question of the age of these structures is an important, though a difficult, one. On account of their manifest identity in plan, they may all be regarded as having come into existence about the same time and under the stress of a similar necessity. In the present state of information on the subject, the theory which fixes the period of the brochs between the fifth and ninth centuries of our era will commend itself to many as the one which best harmonises with ascertained facts. Another important question connected with brochs is that of their geographical distribution. They are to be met with in greatest numbers in the most northerly parts of the mainland of Scotland, in Orkney, in Shetland, and in the Western Isles. Altogether about three hundred and seventy such structures are known to exist, and others have doubtless yet to be discovered. Several which have completely disappeared have left traces of their existence in place-names. Seventy-five are still to be found in Shetland and seventy in Orkney. In Caithness and Sutherland respectively there are seventy-nine and sixty, while in the Western Isles there are sixty-nine. There are very few on the mainland south of Inverness-shire. In Perthshire there is one at Coldoch. There are two in Forfarshire, viz., Hurley Hawkin and The Laws; while The Tappock,

at Torwood, in Stirlingshire, and Eden's Hall, on Cockburn Law, in Berwickshire, complete the scanty list. It should be added that the foundations of a building believed to be a broch were discovered not very long ago in Bute, and there is ground for holding that a similar structure formerly existed at Corriegills, Arran, between Brodick and Lamlash.

#### CONSTRUCTION OF THE FORTH BRIDGE.\*

THE total length of the viaduct will be 8,296 feet, or nearly  $1\frac{1}{2}$  miles, and there are two spans 1,710 feet, two of 680 feet, fifteen of 168 feet girders, four of 57 feet, and three of 25 feet being masonry arches. The clear headway for navigation will be not less than 150 feet for 500 feet in the centre of the 1,710 feet spans. The extreme height of the structure is 361 feet above, and the extreme depth of foundations 91 feet below the level of high water. There will be about 53,000 tons of steel in the superstructure of the viaduct, and about 140,000 cubic yards of masonry and concrete in the foundations and piers. The main piers, three in number, consist each of a group of four masonry columns, faced with granite, 49 feet in diameter at the top, and 36 feet high, which rest either on the solid rock or on concrete, carried down in most cases by means of caissons of a maximum diameter of 70 feet to the rock or boulder clay, which is of almost equal solidity. The stresses to be provided for are those arising from the weight of the structure itself, the rolling load and wind, as well as from change of temperature. The rolling load has been taken as 1 ton per foot run on each line of rails over the whole structure, or a train on each line consisting of 60 short coal trucks of 15 tons each, headed by two locomotives and tenders weighing in the aggregate 142 tons. The wind pressure provided for is a pressure of 56 lbs. per square foot striking the whole or any part of the exposed surface of the bridge at any angle with the horizon, the total amount on the main spans being estimated at nearly 8,000 tons. The material used throughout is open-hearth or Siemens-Martin steel. That used for parts subject to tension is specified to withstand a tensile stress of 30 to 33 tons to the square inch, with an elongation in 8 inches of not less than 20 per cent. That subject to compression only, a tensile stress of 34 to 37 tons per square inch, with an elongation in 8 inches of not less than 17 per cent. Strips of each class  $1\frac{1}{2}$  inch wide are to bend cold round a bar, the diameter of which is double the thickness of the strip. The tensile strength of the rivet steel is 26 to 30 tons per square inch. The superstructure of the main spans is made up of three enormous double cantilevers resting on the three piers before mentioned. Those on the shore sides are 1,505 feet, and that on Inch Garvie (an island fortuitously dividing the deep-water space into two channels of nearly equal width) is 1,620 feet in length; the effective depth over the piers is 330 feet, and at the ends 35 feet. The centre portions of the two 1,710 feet spans on each side of Inch Garvie are formed by two lattice girders 350 feet in length, and 50 feet deep in the centre, and 37 feet deep at the ends. The compression members of the cantilevers are, as a rule, formed of tubes either circular in form or circular with flattened sides. The tension members are girders quadrangular in section; the booms at their corners take the strains, and the vertical and horizontal bracing of the sides keep them stiff against the effects of their own weight and wind respectively. The steel is delivered at the works in plates cut nearly to size, and as angle bars of various sizes and lengths. Plates which have to be bent or shaped are so treated at a red heat in hydraulic presses with moulds of special construction, and all edges are planed. The plates and bars, whether composing circular members, or the booms of the girders with all the required covers, &c., are as a rule assembled in their exact positions, and operated upon by drills of special construction, which, traversing their whole length, bore nearly all the holes required for the rivetting.

In describing how the superstructure had been erected, Mr. Cooper divided the subject into the three following principal groups:—

I. The erection on timber staging, giving support from beneath, by the use of ordinary derrick cranes.

II. The erection by special appliances placed on extensile platforms, or scaffolding, which varied in position according to the progress of the work.

III. The erection by means of special cranes, which, resting on the members themselves, enabled the latter to be extended, and in turn become the support of the former.

This last system allowed the use of temporary appliances to be reduced to a minimum.

Group I.—The first plates of the superstructure comprised in this division that were dealt with, were the lower bed-plates, which rest on the masonry piers, and ultimately transmit to them the whole weight of the superstructure, rolling load, &c.

\* A Paper read by Mr. F. E. Cooper, C.E., at the Glasgow meeting of the Iron and Steel Institute.



The plates forming these were put together upon iron supports sufficiently high to enable the girders carrying the holders-up of the hydraulic rivetters to be manipulated beneath. Under ordinary circumstances the upper bed-plates would be the next parts put together, but the skewbacks, as the massive junctions at this point are termed, and of which they formed the foundations, were not as a rule sufficiently advanced to enable this to be done. Therefore, to save time, the tubular bottom members between the skewbacks were first erected and rivetted in their ultimate position, and in some cases, for a similar reason, the transverse and diagonal bracing girders were completed at an early stage. As soon as it was possible to obtain them, the upper bed-plates and skewbacks were erected, the former, as in the case of the lower bed-plates, in an elevated position, for convenience in rivetting, being afterwards lowered. Next those portions of the vertical columns, diagonal struts and bottom members over the piers, and first struts and bottom members of the first bay of the cantilevers, extending to about 40 feet above or beyond the masonry, and within reach of the ordinary derrick cranes, were placed in position. The timber used temporarily in the staging for the support of these amounted to about 10,000 cubic feet in the case of Queensferry and Fife piers, and rather more at Garvie, and the amount of steel thus erected was about 2,000 tons in each of the two former, and 2,600 tons in the case of Garvie.

*Group 2.*—The point was now reached at which the appliances under Group 2 were brought into play, and it was only after careful and protracted consideration that the system made use of was adopted. The principal conditions laid down with reference to the central portions of the double cantilevers were:—1. That in order that the men should be able to work at any height in as great security and comfort as if on the level of the ground, platforms or scaffolding of considerable area should be provided. 2. That the raising into position of the several parts of the structure should be as little as possible interrupted by wind, the ordinary derrick cranes not being then considered applicable. 3. That the weight of the platforms and apparatus should not much exceed 400 tons. 4. That the connections forming the supports should not bring excessive strains upon any part of the permanent structure. 5. That no rams of the lifting apparatus should have to exert a lifting force of much more than 100 tons. 6. That the platforms should form ultimately stages for building the top members over the piers. 7. That, for the sake of economy, material forming part of the permanent structure should be made use of temporarily as much as possible. The platforms provided were two in number, one on each side of the axis of the bridge. They were 20 feet wide and 200 feet long at Fife and Queensferry, and 350 feet long at Garvie, composed of timber planking and joists, which rested on two longitudinal girders, one on each side of the vertical columns, formed of part of the booms and bracing of the first permanent ties of the cantilever. These were carried by cross girders, constructed of plates forming part of the second and third permanent struts, passed through the northern and southern pairs of vertical columns respectively, plates being temporarily omitted for the purpose. A double set of short cross girders inside each vertical column formed the supports for the hydraulic jacks, which raised, when necessary, the cross girders first referred to, and with them the platforms. The cross girders inside the columns were supported by means of pins passing through their ends, and through the webs of the I-beams forming part of the vertical columns. The main lifting rams were  $13\frac{1}{2}$  inches in diameter, and were capable of lifting 240 tons with the water supplied to them by special pumps, at a pressure of about 30 cwt. per square inch. The total weight actually lifted by the four rams did not, as a rule, much exceed 450 tons, exclusive of friction. The plates and beams forming the vertical and diagonal columns were raised by ordinary hoists to the level of the platforms. These were then taken by small trollies to a goliath, running along temporary rails on the surface of each platform, which lifted them into and held them in place while they were bolted to those previously built.

Rivetting machines, of special and ingenious design, suspended below the platform, dealt with those portions of each tube allotted to them. As soon as a 16-foot length of the vertical columns was rivetted below, and a similar length added above, the hydraulic jacks were set in action, and the platforms were raised by successive steps of 1 foot a height of 16 feet, when the above-described operations of building and rivetting were resumed. In this way those on the centre portion of the Queensferry cantilever were raised the extreme distance of 281 feet in about twenty-four weeks. The platform girders were then trussed by links formerly used in old Hammersmith Bridge, and upon them the massive girders forming the top members of the cantilevers, between the vertical columns, were put together and rivetted. The timber platform was then laid upon the latter, and the lifting platforms and their girders, and other apparatus, were taken apart and lowered piecemeal. The lower members of the cantilevers, formed of tubes 12 feet in diameter, were extended outwards from the piers for about

40 feet by means of ordinary cranes. Beyond that point they were erected by means of an ingeniously devised crane fitted with hydraulic lifting, turning, and traversing gear. This crane was seated on a carriage, movable along the top of a framework 20 feet square and 48 feet long, first built in sections upon and surrounding the tube itself. As each section of the latter was completed in front (the men employed in bolting up, &c., standing on the timber flooring supported on the bottom of the framework), the crane was used to transfer the sections of the framework, previously unbolted, from the back to the front, and in this way the tube by successive operations was built out for a distance of about 160 feet from the piers.

As in the case of lifting platforms for the central portion, the objects kept in view in the design of this apparatus were large working platforms for the men, and for the putting in place of material cranes actuated by hydraulic power with a short lift. For the erection of the lower portion of the first strut, and of the first vertical tie and support to the internal viaduct, lifting platforms, similar to but smaller than those first described, raised by jacks placed in the vertical tie and on the vertical columns, were used. These were originally intended to have been carried up to the level of the underside of the top members, and upon them, when strengthened, those members were to have been built; but the experience gained up to this time as to the ability of the men to work unaffected in situations more exposed than was at first deemed advisable, as well as to the ease with which large and heavy pieces of material could be raised great heights by ordinary cranes and tackle with little interruption from anything but a strong wind, rendered it possible for a great modification to be made in the mode and apparatus made use of, and these platforms were carried no higher than the level of the intersection of the first ties and struts. The appliances used on the erection up to this point, though amply fulfilling all the conditions of the problem, were necessarily slow in action, and costly to make, put together, and take down; and it must be borne in mind that when the vertical columns, with their bracing and top and bottom members connecting them, were completed, an immensely powerful support was available from which the other members of the cantilever and the internal viaduct could be held up by temporary stays as securely as if supported by staging on the solid ground below. The weight of the portions of Fife and Queensferry cantilevers erected under Group II. was about 3,000 tons each; at Garvie it was somewhat more.

*Group 3.*—With the exception of the first bay of the lower members, the first 120 feet of the internal viaduct, and the lower portion of the first struts, the whole of the principal members of the cantilever are included in this group. Two types of special cranes are employed, one made use of to build the top members and upper halves of the struts and ties. The other is traversed along the internal viaduct, and deals with the remainder of the work. The top member crane is provided with a horizontal jib, 35 feet in length, which can be slewed through an arc of 230 degs., and along which the suspending pulleys can run. The lifting of the material is effected by a steam winch, the main drum of which accommodates about 400 feet of wire rope  $1\frac{3}{4}$  inches in circumference. This crane is supported on a carriage, formed of two steel cross girders strongly braced, and which rest on the upper surface of the angles connecting the vertical webs to the flanges of the booms of the top members, and along which, when desired, it is traversed by means of powerful screws. In some cases, at the back of the carriage a hydraulic crane is attached, along the horizontal jib of which run the supports for a hydraulic rivetter, used for completing that part of the work within its reach. An ordinary derrick crane is sometimes substituted for this part of the apparatus. Beneath the top member, and strongly attached to the carriage of the crane, is suspended, on four longitudinal girders, a roomy platform of timber, 76 feet long and 45 feet wide.

The building operations are thus carried on. Each length of the vertical webs of the top members is first raised by the ordinary hoist to the level of the internal viaduct. It is then carried on a trolley to a point beneath the jib of the top member crane, which raises it to its exact position, and holds it there, while the men standing on the platform bolt it to that already complete. The lower booms are first thus secured, then the vertical and horizontal bracing bars are fixed, and lastly the top booms. When the length is complete, the carriage is slid down a convenient distance, and the building operations are again resumed, and are continued until the member reaches the centre of the bay. When, in the case of bay 1, the overhang was 125 feet, and the strain on the vertical bracing (temporarily doubled) had nearly reached the working strain of  $6\frac{1}{2}$  tons per square inch, with the end of the members deflected about 8 inches, a temporary continuation of the vertical tie in the centre of the bay was built up to the underside of the top members, and jacks being interposed, the latter were raised the amount they had deflected, and secured by wedges. Similar extensions of the vertical ties will be required in the case of the other bays in order to support temporarily and adjust the top



members above them. The crane then continued the building until the top members reached the junction at the upper ends of the first struts, where any deflection in them was again removed, and the permanent connections at this point were completed. At convenient intervals the building of the top member was suspended, and the crane employed first in building down the ties, which operation was similar to that already described for the top members, except that the men occupied stood on small timber stages suspended from and enveloping the member, and which were lowered as required by ordinary tackle. Afterwards, the upper halves of the struts were built in the same way, except that the extension was in the reverse direction.

In order to prevent excessive strain on the unsupported lengths of both ties and struts, temporary struts from the vertical columns were put in where required, light girders and wire ropes being also largely made use of. The internal viaduct crane consists of two masts and jibs of the derrick type, the former in line transversely with the axis of the bridge, and 16 feet apart, braced strongly together, and secured to a movable timber frame traversed along the outer rail troughs of the viaduct. Each jib is raised and lowered by means of a wire rope passing round a drum on the mast, but the wire rope lifting the material is passed through a sheave at the extremity of the jib; thence it is led over a sheave down the centre of the mast, and by means of guide pulleys to some convenient point on the finished structure, whence to a steam winch. The object for separating the power from the crane is to lessen the weight concentrated at that point, the viaduct there being extended much in advance, and as a rule acting as a cantilever, its outer end being temporarily supported by wire ropes to some part of the finished structure. When the viaduct girders are being extended by these cranes little staging is required, the men being able to do the bolting up standing in the troughs forming the top and bottom booms. To provide the necessary standing room for the men when at work on the lower members, light platforms of timber are hung from the tubes by trusses of convenient form. For the building of the lower portions of the struts and ties the same stages are used as described in the case of the upper portions of these members. Steam winches, with blocks and tackle attached to convenient points, are used to lift into and hold in position the parts, not usually exceeding two tons in weight each, of the wind and other bracing of the various members, the men doing the bolting up either hanging on to the parts themselves or standing on planks placed where necessary. Wire ropes are now almost entirely used for the cranes, running gear, and temporary support, being found most trustworthy, and, when treated properly, should never give way. The rivetting of the bottom members of the cantilever, of the vertical columns, and of portions of the diagonal struts between them, has been executed by hydraulic rivetters of special design, the principle of which has been to use independent rams for the holder-up and the snap. The holder-up could be traversed along a girder usually pivoted so as to revolve on the axis of the tube, or with its ends moving in a race, so that the girder moved round the tube parallel to its axis. In both cases the holder-up preserved its direction normal to the surface. The snap was fixed in a ram which also could be traversed along a girder, the latter being movable parallel to the axis of the tube, with its ends travelling in slots formed in rings surrounding the tube. By this arrangement of motions both holder-up and snap could deal with every rivet.

The operation of rivetting was as follows:—The rivet, properly heated, was placed from the inside into its hole, the holder-up was brought opposite to it, the valve admitting the water was turned on, the holder-on thrust the rivet in up to the head, and held it there, whilst the ram on the outer girder closed the rivet, the same valve admitting water to both rams, but a slight check in the branch leading to the outer ram permitted the rivet to be sent home by the inner ram before the pressure was applied to form the snap. About 800 rivets could be closed by this apparatus in ten hours. The bed-plates, both upper and lower, were rivetted by similar apparatus, but simplified inasmuch as plane surfaces only had to be dealt with. For the interior parts of the skewbacks, where the space was too confined for hand-rivetted, or for the use of rams of ordinary size, special rams of small size, 4 inches in diameter, were used as holders-up and snaps, the necessary power being obtained by multiplying the ordinary pressure of 1,000 lbs. about six times, by the use of an apparatus fitted with rams 4 inches and 10 inches diameter. Grab machines of various patterns were designed and made by Mr. Arrol for the rivetting of the top members, for the ties, and for parts which could be reached by this form of rivetter. Mr. Arrol has also greatly simplified the subject of rivetting by designing and constructing small reverberatory furnaces for heating the rivets by the blast-furnace residual oil, delivered in a fine spray by air at about 20 lbs. pressure, through a disintegrator of special design. This has been a great success. The regulation of the heat is complete, the rivets are uniformly heated, the apparatus is more

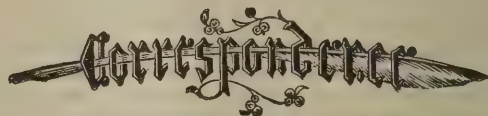
economical than hand fires, and is under perfect control. It is also cleanly, and the danger from fire is much reduced. A small furnace, 1½ feet square and 4 feet long, will heat 2,000 rivets per day, at a cost for oil of about four shillings.

### STRATA FLORIDA ABBEY.

IN connection with the excursion of the Cambrian Archaeological Society a visit was paid by some of the members, conducted by Mr. Stephen Williams, of Rhayader, to the ruins of this abbey. After inspection, the party adjourned to a neighbouring farmhouse. Mr. E. Laws observed that about 160*l.* had been spent in the removal of 3,500 cubic yards of material, complimented Mr. Williams on the excellent results that had been attained by him in laying bare the ground plan of the abbey church, and suggested that precautions should be taken to preserve the remains from spoliation and decay by fencing in the buildings and roofing over the encaustic tile pavements.

Mr. Williams described the progress of the excavations with the aid of a plan and numerous drawings of the various details recovered. The whole of the lower portions of the piers of the nave were now laid bare, showing that they were rectangular for about 6 feet above the floor-line, and surmounted by round, clustered pillars. The carved capitals and arch mouldings had also been found, with the setting-out lines still visible upon them. On the east side of the north and south transepts were six chapels, three on each side of the choir, containing altars and having groined roofs with carved bosses. The encaustic pavements in these chapels were exceedingly fine, and in splendid condition, being of thirteenth-century date, arranged so as to form coloured patterns of great beauty. The centre of the nave was still untouched, and no attempt had yet been made to trace the plan of the surrounding conventual buildings.

Mr. J. P. Seddon compared the architectural details found at Strata Florida with those of the cathedrals of Llandaff and St. David's. He pointed out that the sculpture at Strata Florida was of a remarkable character, as exhibiting Transitional forms between the stiff foliage of Norman times and the graceful flowing lines of the capitals at York and Lincoln. The interlacing of the leaves and stems indicated a survival of Celtic feeling. The tile pavements were quite unique. Tourists had already begun to show the cloven hoof by carrying away tiles, damaging the general effect irretrievably.—Mr. Romilly Allen called attention to the exceedingly curious series of graves on the outside of the east wall of the south transept. Each pointed east and west. A long slab of slate with a plain cross was laid flat on the grave, at the foot was a small upright stone, and at the head an upright cross of Bath stone, with interlaced work carved on the face. The dressing of the headstones and the general character showed that they were probably of the twelfth century, but the interlaced work was evidently a survival of a previous style.



### Theatre Exits and Fire Risks.

SIR,—The letter in your last issue under this heading, and signed "An Architect," clearly and sensibly points out the necessity of the theatre-going public and the press insisting upon the scenery and accessories of theatres being covered with a non-inflammable composition, on the ground that most fires in theatres arise from contact of flame with the light woodwork and canvas with which the stage is surrounded. It is curious to note how the scare occasioned by the deplorable loss of life at the Exeter Theatre, and the minor disasters at the Grand Theatre, Islington, and elsewhere seems to have faded from the public mind. "Extra" and "emergency" exits, iron and asbestos curtains, and many similar precautions for safety from fire, have allayed the public alarm. In Mr. Paul Lamberts' able communication, published in your issue of the 17th, grave doubt is thrown upon the efficacy of asbestos and iron curtains to prevent the spread of fire in theatres, on the grounds that asbestos becomes incandescent when subjected to flame, and is consequently a conductor of heat, and that iron, under the influence of high temperature, rapidly expands, with the consequence that a curtain composed of these materials would be rendered useless in the case of a fire on account of warping and distortion. A plain conclusion is drawn from these opinions, and that is simply that prevention is better than cure. Why waste time in devising means to stop the spread of a fire when it is quite possible to prevent the fire from taking place at all? There are several fireproofing preparations at present before the public, but an undoubted defect in many of



them is the fact that they rot or render brittle fabrics that are treated with them.

"Pyrodene," lately used at several leading theatres, appears to have overcome this obstacle. Any inflammable article, such as paper, textile fabrics, wood, &c., soaked in this liquid defies all attempts to set it alight, besides increasing the endurance of the article subjected to its influence. If architects and managers will adopt the means at their hands to prevent the possibility of the commencement of a fire, by rendering inflammable all the flimsy surroundings of the stage, the grave question of "Theatre Fire Risks" is effectually and satisfactorily answered.—Yours faithfully,

Junior Garrick Club, W.C. :

August 28, 1888.

FRED. S. HOBLYN.

SIR,—Noticing in your issue of the 17th inst. a letter from one of your correspondents headed "Theatre Exits and Fire Risks," I take the liberty of submitting certain information which may be of some service to your numerous readers.

After a report made by you early this year with reference to some tests conducted by Mr. W. H. Stanger, C.E., to determine what materials were best adapted for use in the construction of fireproof buildings, I made several experiments with the "silicate cotton" or "slag wool," so favourably mentioned in your report, and found it to be admirably well adapted for fireproofing purposes, for the reasons set forth by your correspondent. I have found that "slag wool" does not become incandescent throughout when a body of it, say 1 inch thick, is subjected to extreme heat, but simply the parts in immediate contact with the flame become fused, leaving the rest perfectly intact. I found, further, that when heated through, after a lengthy subjection to the flames, there was no symptom of radiation whatever, a thermometer held within  $\frac{1}{4}$  inch of the surface not indicating any variation.

The fireproof curtains fixed up in the different Liverpool theatres by Mr. Max Clarke, of London, being all lined with "slag wool," must most effectually prevent the transmission of heat, whilst equally shutting off smoke and flame. No doubt there are many ways in which "slag wool" might be employed for fireproofing purposes generally in a building, and I have no hesitation in saying that it will be found to be one of the most efficient of the non-conducting substances suggested by your correspondent.—Yours truly,

CHAS. PERKS.

Rose Hill, Bowdon, Cheshire :

August 27, 1888.

SIR,—I fully endorse Mr. Paul Lamberts' opinion expressed in your issue of the 17th inst. with reference to the mistaken idea that iron and asbestos curtains are safeguards against fires spreading in theatres. He is quite right when he observes that they become incandescent when subjected to flames, and while in this state they form an excellent medium for conveying the heat to the auditorium rather than for keeping it away. But why have a flame at all to cause this incandescence? It is not because modern science has failed to provide us with the means to prevent it. There are at the present moment a number of fireproofing preparations before the public of undoubted merit, which, if they were more generally used, would reduce our fire risks to a minimum. Take "Pyrodene," for instance. Any inflammable article, such as paper and textile fabrics, soaked in this liquid and allowed to dry, defies all attempts to set it alight. (I mention this particular article because it appears to me free from anything which rots or renders brittle fabrics so treated, a rather unfortunate defect in most others, though equally effective as fireproofers.) Most large fires have a small beginning. A lighted match or gas-jet touches some inflammable material, and the building is instantly in flames. If these were treated as I have suggested, and a light accidentally touched them, they would simply refuse to inflame; the only damage done would be a charred spot where the flame had actually touched. Here, I take it, the difficulty is overcome. Let architects and theatrical managers adopt these means to render the too often flimsy stage materials flame-proof, and they will prevent fires from starting, which to my mind is a far more reasonable method than attempting to prevent a fire spreading after it has started.—Yours, &c.,

August 23, 1888.

A. C.

#### "Mr. Gladstone on Pottery."

SIR,—Under the above heading, I have just read a short article from your esteemed journal, copied into the *Morning Post*, of yesterday's date. It runs thus:—"Mr. Gladstone is no great connoisseur in pottery, if we may judge by his collection when it was seen at Christie's, but he has aided in obtaining recognition for the merits of Josiah Wedgwood." Will you permit me to differ with you in this remark, because from personal knowledge and observation I happen to know that there are very few better judges of ceramics in England than the ex-Prime Minister. His collection of porcelain and pottery, when sold at Christie's some few years ago, contained many

very fine and rare specimens of old Wedgwood, Chelsea, Worcester, Derby, &c., and realised exceptionally high prices, purely on their own merits, and quite apart from their having belonged to so distinguished a collector. I do not wish to enter into any controversy upon the marvellous productions of the "immortal Josiah"; it might appear egotistical on my part, possessing as I do a very extensive collection of his cameo wares, but Mr. Gladstone is correct in saying that Wedgwood's pottery was never equalled, much less surpassed, by any man, in any country or in any age.—Your obedient servant,

FELIX JOSEPH.

The Grand Hotel, Eastbourne : August 26, 1888.

#### School Board Inquiry.

SIR,—Since my notice to move for a Royal Commission appeared on the Board's agenda paper, I have been favoured amongst others with a large number of anonymous letters giving me information of facts connected with the purchase of sites and erection of schools, which are certainly most fully borne out by the evidence given before the special committee on the Works Department obtained by me in October last. This evidence has just been published, contained in over 500 pages of matter, and which I would strongly urge upon the ratepayers of the Metropolis, who take an interest in the doings of the London School Board, to peruse. They will, I think, understand therefrom how their money has been wasted, and how the Works Department has been conducted under past Boards. As your paper will, no doubt, be read by those persons who have written to me anonymously, I venture to ask them to kindly give me their names and addresses in order that I may communicate with them personally. Any information thus given me, they may rest assured will be treated confidentially until such time as I have their authority to use it publicly. It is needless for me to add that I have had, and still have, great opposition from certain quarters in the thankless task I and other members have undertaken. This must be my excuse for troubling you with this letter.—Yours faithfully,

J. T. HELBY,

Member of the London School Board.

Glengarriff, Herne Hill, S.E. : August 23, 1888.

#### Registration of Plumbers.

SIR,—What has become of the Scottish Registration Scheme for Plumbers? I have neither heard nor seen anything in the professional journals for some time past in reference to this matter. Has it exploded, or is it still in existence, and if so, why is it not made public? This idea of voluntary registration is certainly good, but why does not some such body as the Worshipful Company of Plumbers seek the power of compulsory registration, so that architects and the public may not be victimised by bad and defective plumbing?—Yours, &c.,

Glasgow : August 29, 1888.

A SCOTCH ARCHITECT.

#### ARCHÆOLOGY.

**Scythian Remains.**—The *Allgemeine Zeitung* gives an account of a sepulchral discovery made in the Kuban, not far from the Krimskaya railway station. The district abounds with sepulchral mounds, one of which was opened at the request of the Imperial Russian Archæological Commission. A large vaulted building was found, between 60 feet and 70 feet long. It was divided into three chambers and a corridor. The walls were made of thick stone flags, about 4 feet high; the floor and roof was similarly constructed of flags, joined together by cement. The height of the chambers varied from 7 feet to 11 feet. The entrance to the innermost chamber was closed with flags. Within it were broken iron fragments of a wheel and reins, and bones of a horse. In a corner was a great amphora of clay, beside it a silver drinking vessel, and near them about 150 glass beads, some of evidently Egyptian origin. Some had the form of a medallion set in silver. Lying parallel with the side-wall of the first chamber was the skeleton of a young woman, with her head to the east. The experts consider she was a queen. She had a thick necklet of gold. Near her was a thin triangular gold plate, nearly 8 inches broad, with holes at the corner, showing that it was to be attached to the dress. There was stamped upon it the figure of a young Scythian presenting a drinking horn to a queen, who was richly clothed, and wore a cap of a material fashioned like lace, with a small gold shield on it. On the right and left of this queen was the figure of a woman, the head covered with a cloth. Medusa heads, a chariot with horses, and other figures are also represented on this triangular gold plate, which thus becomes important in the history of art in the Scytho-Bosphoric district. Very near where this gold plate lay sixteen pigeons cut from gold-leaf,  $\frac{1}{2}$  inch wide, were found, and about fifty other objects similarly cut from gold-leaf, resembling Medusa heads, stars, &c. Two gold earrings of filagree work of fine quality lay near the head of the skeleton. There was



also lying near a gold chain with a lion's head at the end. On both arms was a massive gold bracelet, snake shape, at the ends of which were horse heads attached to snake bodies. A large gold ring was on the finger of the right hand; it bore the effigy of the Muse Erato, playing the lyre. The next chamber was empty, the floor covered with a thick layer of ashes. Then came a corridor, the walls lined with stucco, on which was modelled the figure of an antlered stag. At the end of a corridor the bones of a horse lay in a heap, with fragments of various pieces of harness. At the entrance to the third room there was a quantity of broken pieces of amphoræ, which had, no doubt, been destroyed by the falling-in of the roof. The last room was larger than the others, and about 4 feet higher. The flags were alternately large and small, and the stuccowork was of a superior style. There were a few utensils in the room of copper, much corroded. A great copper dish was near a large amphora in a corner; on it were two silver drinking-cups, one of which had a gold band round the rim, on which birds were carved. Close by was a large copper shield. A male skeleton, with the head to the east, lay parallel with the side wall. A thick gold band, weighing a pound, was around the neck; the ends represented lions devouring wild boars. Near the skeleton was a silver quiver inlaid with gold, on which figures were drawn with much skill. Near this was another similar quiver with 100 copper arrows, a Scythian sword with a gold handle, and a cylindrical stone for slinging, through which a hole was bored. The experts are satisfied that this was the burial-place of a Scythian king. From the remains of boards which lay near, it would appear that both skeletons were originally placed in coffins. The value of the objects found has been set down at 50,000 roubles. Everything has been removed to the Imperial Museum at St. Petersburg.

### CHURCH BUILDING AND RESTORATION.

**Manchester.**—The contracts for the several works required in the erection of the Jesse Haworth Memorial Church have been let to Messrs. S. Hobson, of Rawtenstall, and John Smith & Sons, Thomas Cornall, and John Kay & Sons, of Bury, and building operations have been commenced. The site, which is several acres in extent, and sufficiently large for schools and vicarage house, is in a commanding position on the road leading from Walshaw to Lower Croft, and has been given by Lord Derby. The accommodation is nominally for 550 worshippers. The architect is Mr. Lawrence Booth, of Manchester.

**Rochester.**—The foundation-stone has been laid of a new Primitive Methodist chapel and school. It is built of pressed and common red bricks, with local stone dressings in Early Gothic style. The chapel, which seats 150 persons, contains vestibule, rostrum, and communion table, and has an open, seven-sided, barrel-shaped roof carried by three trusses. The whole of the wood is pitch-pine, stained and varnished, and the windows are of cathedral-tinted glass. The schoolroom is estimated to accommodate, with the classrooms, 100 scholars, the whole building being well ventilated, heated with hot-water pipes, and lighted with gas. Mr. George William Bradford, Hanley, is the architect, the builder being Mr. William Thorley, of Snelston, near Ashbourn.

### NEW BUILDINGS.

**Edinburgh.**—The Lord Dean of Guild has granted a warrant to the Edinburgh Town Council to convert the present Police Court-room in the Police Chambers into offices, and to make other alterations on the ground floor, to convert certain offices on the first flat into a new court-room and offices, and to improve several of the other offices, and also to form in the roof over the housekeeper's house an additional storey consisting of two rooms and a bath-room, and to make numerous minor alterations. It is intended to have on the ground floor apartments for the chief constable, his clerks, the superintendent of the Central Division, the lieutenants, and the Criminal Investigation Department. On the first flat there will be, in addition to the Police Court, accommodation for the clerk of court and the procurator-fiscal. The burgh engineer's office, which is at present on the first flat, will, it is intended, occupy the flat above the house formerly used by the chief constable. The medical officer of health and the collector of police rates will not be affected by the proposed changes. A new entrance to the detective department is to be made from Parliament Square, and an entrance to the new court will be made from the old Fishmarket Close by means of a stair.

**Kingussie.**—The foundation-stone of the public-hall and reading-room for Kingussie has been laid. The hall is a handsome building, designed by Mr. Mackintosh, architect, Inverness, and will furnish accommodation for about 500 persons. The hall is lighted by five large windows on each side of the building, and ventilation is secured by four ventilators in the

roof, and four ventilating shafts run from floor to ceiling. In the north end there is a recess for a platform, in which one is to be constructed.

### GENERAL.

**An Exhibition** of paintings and sculpture is to be held at Kilmarnock under the auspices of the Local Fine Art Institute during the ensuing winter. The Marquis of Bute will be asked to preside at the opening.

**Professor Angeli**, of Vienna, is engaged on a portrait of the Emperor of Germany, who, notwithstanding all the work he has undertaken of late, has found time to give a sitting of some hours to the painter.

**Two Stained-Glass Windows**, designed by Mr. F. Burne Jones, A.R.A., and executed by Messrs. William Morris & Co., Merton Abbey, have been placed in St. Philip's Church, Birmingham, and also a font designed by Mr. J. A. Chatwin.

**Professor Rhys**, of Oxford, has been selected to deliver the Rhind Lectures at Edinburgh next year. His subject will be "The Early Inhabitants of Britain, with Special Reference to Scotland."

**It is proposed** to memorialise the Government to erect a new post-office at Ayr. The present building is not considered adequate.

**Mr. C. F. Wike**, assistant borough surveyor, Leicester, has been appointed borough surveyor for Sheffield, at a salary of 800*l.* per annum.

**The Dean of Peterborough** has issued an appeal for funds to complete the restoration of the cathedral. At present 18,000*l.* is required merely to secure the safety of the fabric, after which he hopes to undertake the restoration of the choir.

**An Amalgamation** between the Sanitary Institute of Great Britain and the Parkes Museum has taken place, and the objects of the two societies will in future be carried on by the Sanitary Institute, incorporated this month.

**Plans** for a new church to be erected at Pinxton, near Alfreton, by Mr. G. Statham, of Matlock and Nottingham, have been selected in competition.

**The Late Mr. T. Heygate Vernon, A.R.I.B.A.**, who for several years carried on the professional practice of Mr. E. M. Barry, R.A., has now been succeeded by Mr. E. Elton Hawkins, of 19 York Buildings, Adelphi, W.C. The latter gentleman was for a long period associated with both the deceased architects.

**The Norwich Town Council** have decided to invite the Royal Archaeological Institute of Great Britain to hold its summer congress next year at Norwich.

**The Plans** of Mr. Owen, of Warrington, for the extension of the town workhouse, have been forwarded to the Local Government Board for approval.

**At the Birmingham Library**, Union Street, some additional buildings comprising a gentleman's smoking-room, a ladies' drawing-room, and a librarian's room, with entrance lobby opening into the ground floor of the old library premises, have just been completed.

**M. Charles Garnier** has been appointed a member of the Commission on French Theatres, which is to report to the Minister on all questions relating to the safety of the buildings.

**The River Wear Commissioners**, on Wednesday, sanctioned the expenditure of 11,000*l.* for improving the approaches to the Sunderland docks.

**The Ordnance Survey** of Bolton and suburbs, on the large scale, has been commenced under the supervision of Captain Sankey, R.E.

**A Committee** has been appointed to consider the subject of erection of a market, town hall, town offices, &c., at Llandudno, on the vacant spot between Lloyd Street and the present market hall.

**A Tunnel** is being driven underneath Lake Michigan, through which the water supply of that city is to be drawn, and has already been carried upwards of 280 feet below the lake.

**A Gentleman** in Driffield has offered to defray the cost of building a public clock tower for the town, if a bell of not less than two tons is provided for the clock, which has been given by Mr. Holtby, of Nafferton.

**Casamicciola**, which was laid waste by the earthquake, is fast rising again into life. About eighty pretty châteaux have been erected around the wood and iron houses of the village, capable of lodging 3,000 persons. Private villas of two storeys, of wood and surrounded by gardens, have also been erected. The large bathing establishment is ready, and another is in course of construction, while cafés and restaurants are not wanting. The Pio Monte della Misericordia is spending three millions of francs on the erection of an hygienic establishment for its patients. Next to this building will soon rise an hotel, built of wood and iron.

CRIMINAL PROCEEDINGS, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, Ld.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, AUGUST 31, 1888.

## THE ARCHITECT AND CONTRACT REPORTER.

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### COMPETITION OPEN.

GORTON.—Sept. 15.—Designs are Invited for Public Baths. Mr. R. T. Holland, Clerk to the Local Board, Local Board Offices, Gorton.

### CONTRACTS OPEN.

ALLITHWAITE.—Sept. 1.—For Extension of Schools. Rev. J. Hammersley, Allithwaite Vicarage, Grange-over-Sands.

BACKWORTH.—Sept. 1.\*—For Building Mission Church, Shire Moor. Messrs. Hicks & Charlewood, Architects, 42 Grainger Street, Newcastle-on-Tyne.

BARNET.—Sept. 5.—For Construction of Stove and Furnace, with Flues, &c., in the Tailors' Shop at Workhouse. Mr. G. D. Byfield, Clerk to the Guardians, High Street, Barnet.

BLACKPOOL.—Sept. 5.—For Building Theatre and Five Shops, Church Street. Mr. W. Longley, Architect, 5 Charles Street, Bradford.

BRADFORD.—Sept. 6.—For Altering Old Post Office Buildings (Painterwork excepted) into Shop and Offices. Messrs. Milnes & France, Architects, Bradford.

BRIDGEND.—Sept. 7.—For Building Church, Kenfig Hill. Messrs. Halliday & Anderson, Architects, 16 High Street, Cardiff.

BRIXTON.—For Building Baptist Chapel, Wynne Road. Mr. J. Wallis Chapman, Architect, 11 Sutherland Avenue, Harrow Road, W.

CHELSEA.—Sept. 1.—For Alterations and Additions to 107 and 108 Cheyne Walk. Mr. F. Cole, 107 Cheyne Walk, Chelsea.

CHESLYN HAV.—Sept. 15.—For Building New Schools. Mr. W. Wood, Architect, Longton.

CONSETT.—Sept. 8.—For Additions, &c., to British Schools and Formation of Road. The Secretary, Consett Iron Company, Limited, Blackhill, County Durham.

DEWSBURY.—Aug. 31.—For Additions, &c., to Pioneers Industrial Society's Stores. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

\* Names and addresses to be forwarded not later than date.

DUNSTABLE.—Aug. 31.—For Finishing Two Villas, Station Road. Messrs. Benning & Son, West Street, Dunstable.

EDINBURGH.—Sept. 1.—For Construction of Bath-room at Hospital of the Poorhouse, Craiglockart. Mr. Washington Browne, Architect, 5 Queen Street, Edinburgh.

EPSOM.—Sept. 12.—For Building Porter's Lodge, Tramp Wards, Day-room, Dormitories, and Dining Hall, at the Workhouse. Mr. H. D. Appleton, Architect, 157 Wool Exchange, Coleman Street, E.C.

FERNDALE.—Sept. 1.—For Building Nine Houses. Mr. Jones, Architect, Cymmer.

GLOUCESTER.—Sept. 10.—For Building Crypt and Grammar School. Messrs. Medland & Son, Architects, 15 Clarence Street, Gloucester.

GRAVESEND.—Sept. 10.—For Alterations, Shop Fittings, and other Works at Nos. 3, 5, and 7 Harmer Street, for Co-operative Society. Mr. A. G. Smith, Architect, 1 Darnley Street, Gravesend.

GREAT YARMOUTH.—Sept. 3.—For Adding Classroom to Caister Board Schools. Messrs. Hewett & Banham, Architects, 10 Regent Street, Great Yarmouth.

GRIMSBY.—Sept. 3.—For Building Cemetery Chapels, Lodge, Waiting-room, Mortuary, &c. Mr. E. W. Farebrother, Architect, Victoria Street, Grimsby.

HEADINGLEY, LEEDS.—Sept. 1.\*—For any or all of the Works in the Erection of Six Houses. Messrs. Swale & Mitchell, Architects, 98 Albion Street, Leeds.

HOLBORN.—Sept. 5.—For Pointing Brickwork for the Guardians. Messrs. H. Saxon Snell & Son, Architects, 22 Southampton Buildings, Chancery Lane, W.C.

KIRKBY-IN-FURNESS.—For Parish Room. The Vicar Kirkby-in-Furness.

LEEDS.—Sept. 3.—For Additions to House. Messrs. Swale & Mitchell, Architects, 98 Albion Street, Leeds.

LEEDS.—Sept. 4.—For Building House. Messrs. J. Charles & Sons, Architects, 98 Albion Street, Leeds.

LICHFIELD.—Aug. 31.—For Building Girls' Industrial School. Mr. J. T. Meredith, Architect, Bank Buildings, Kidderminster.

LINDLEY.—Aug. 31.—For Additions to Acre Mills. Messrs. John Kirk & Sons, Architects, Huddersfield.

LITTLEPORT.—Sept. 7.—For Rebuilding Brandon Creek Bridge. Mr. T. H. B. Hestop, Norwich.

LONGTON, STAFFS.—Sept. 15.—For Building two Houses near Clayton Street. Mr. W. Wood, Architect, Longton.

NEW BRAMPTON.—For Building Chancel to Church. Messrs. Naylor & Sale, Architects, Irongate, Derby.

NEWCASTLE-ON-TYNE.—Sept. 5.—For Alterations at Central Station. Mr. C. A. Harrison, Engineer.

NEWCASTLE-ON-TYNE.—Sept. 5.—For Extension of Central Station Hotel. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

NEW WORTLEY.—Sept. 4.—For Building Two Houses and Shops. Mr. J. Fawcett, Architect, 26 Albion Street, Leeds.

PUDSEY.—Sept. 3.—For Boundary Walls, Gates, Palisades, and Building Lodge at New Park. Mr. C. S. Nelson, Architect, Albert Chambers, Park Row, Leeds.

PUDSEY.—Sept. 5.—For Building Scribbling Shed, &c., Priestly Mill. Mr. E. Wright, Architect, Greengates, Eccleshill, Bradford.

SOUTH SHIELDS.—For Building Two Houses. Mr. J. Walter Harrison, Architect, Exchange Buildings, South Shields.

\* Names and addresses to be forwarded not later than date.



ST. OLAVE'S UNION.—Sept. 5.—For Painting, Cleansing and Repairs, Supplying and Fixing Hot Water Tanks. Messrs. Newman & Newman, Architects, 31 Tooley Street, E.C.

WINDSOR.—Sept. 4.—For Building Goods Shed. Mr. J. D. Higgins, Secretary, Paddington Station.

### TENDERS.

#### BOURNEMOUTH.

For Purbeck Kerbing, Channelling, Sewers, Catch-pits, Road and Path-making in Eight new Roads (3,300 yards). Mr. G. R. ANDREWS, Surveyor, Town Hall Chambers, Bournemouth.

A. Krauss, Bristol	£1,418	10	0
E. G. Perkins, Lymington	1,389	17	0
J. Edwards, Southbourne	1,160	16	10
W. Hoare, Bournemouth	955	4	2
W. H. Saunders & Co., Bournemouth	944	14	0
J. WHITE, Bournemouth (accepted)	860	0	0
Surveyor's estimate	1,259	0	0

For Street Improvement Works. Mr. G. R. ANDREWS, Surveyor, Town Hall Chambers, Bournemouth.

#### Limmer Asphalte Paving.

J. A. Lawford	£1,508	10	0
French Asphalte Co.	1,293	0	0
Brunswick Rock Asphalte Co.	1,149	6	3
Limmer Asphalte Co.	1,131	7	6
J. Lees	1,077	10	0
BRADSHAW & Co. (accepted)	1,041	0	0
Surveyor's estimate	1,293	0	0

#### Limmer Asphalte Crossings.

Val de Travers Asphalte Co.	518	14	0
French Asphalte Co.	478	16	0
J. A. Lawford	458	17	0
Limmer Asphalte Co.	399	0	0
J. Lees	399	0	0
Bradshaw & Co.	352	0	0
BRUNSWICK ROCK ASPHALTE CO. (accepted)	332	10	0
Surveyor's estimate	400	0	0

#### Wood-Block Crossings.

Bradshaw & Co.	215	0	0
BRUNSWICK ROCK ASPHALTE CO. (accepted)	159	7	6
Surveyor's estimate	150	0	0

#### DURHAM.

For Erection of New Observation Ward at Sedgefield Asylum, Mr. W. CROZIER, jun., Surveyor.

Reed, Newcastle-on-Tyne	£6,089	11	2
Stephenson, London	5,833	0	0
Craggs & Benson, Stockton	5,717	15	0
Forster, Croxdale	5,462	9	10
R. Sanderson, Durham	5,386	0	0
Gradon & Son, Durham	5,282	5	0
Fortune, Jarrow	5,246	2	3
Watt, West Hartlepool	5,237	12	0
W. & R. BLACKETT, Bishop Auckland (accepted)	5,174	0	0

#### EDINBURGH.

For Works on Carriageways for the Edinburgh Town Council.

#### Accepted Tenders.

East Preston Street—J. W. & G. Stratton	£985	10	0
Market Street (Lower)—John Dobbie	538	8	4
Duncan Street—J. W. & G. Stratton	458	5	0
Victoria Street—J. W. & G. Stratton	448	11	6
Ardmillan Terrace—John Dobbie	346	11	8
Market Street (Upper)—J. W. & G. Stratton	280	2	4
Rose Lane—John Dobbie	164	6	8

#### ELTON.

For Building Three Houses, Elton. Messrs. SELLERS & HAMILTON, Architects, Union Chambers, Bury.

J. Fletcher, Elton, brickwork.  
J. C. Waterhouse, Elton, stonework.  
Crossley, Bury, woodwork.  
J. Mason, Elton, plumber.

#### KINGSTOWN.

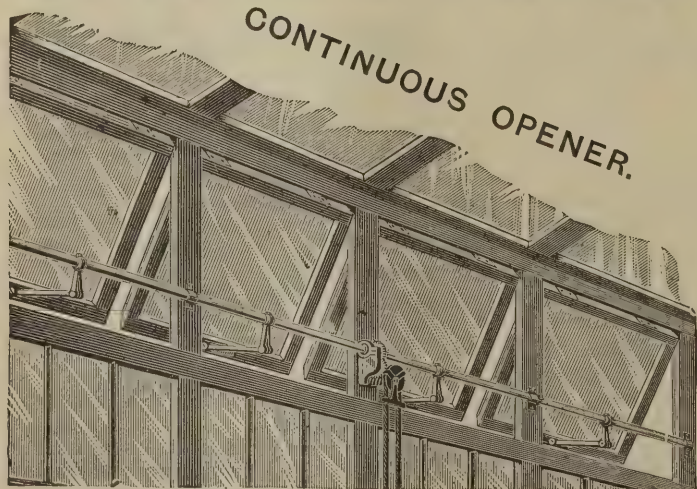
For Laying Water Main, Carrickbrennan Road, Mounttown Road, and Glenagear Road, Upper, for the Commissioners of the Township of Kingstown. Mr. F. A. DOYLE, Town Surveyor.

J. Edmundson & Co., Dublin	£825	0	0
E. F. Baleman, Booterstown	581	0	0
J. Cunningham, Dublin	545	0	0
T. Sexton, Kingstown	420	0	0
J. J. Long, Kingstown	415	0	0
J. Pluck, Kilmacanogue	390	0	0
G. Dixon, Kingstown	385	0	0
R. SIMPSON, Dublin (accepted)	375	0	0

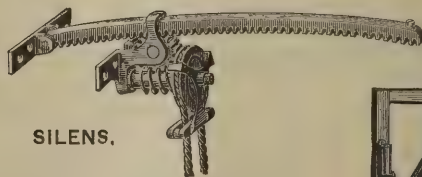
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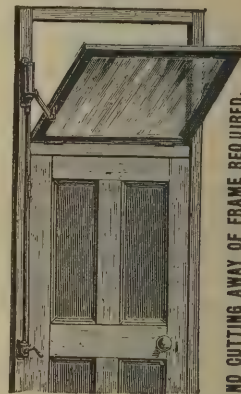
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They are secure in whatever position, whether the window is open or closed, and are quite simple and workable in their action. I prefer them to any other that I have seen or used for the above-mentioned purposes.

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I remain, yours obediently,

R. DAVIES, Architect.

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## HALIFAX.

For Erection of Shop and Offices in Central Street, Halifax.  
Mr. S. WILKINSON, Architect, Sowerby Bridge.

## Accepted Tenders.

J. Turner, Warley, mason.  
G. Townsend, Halifax, joiner, &c.  
W. Ward, Halifax, plumber and glazier.  
T. Dyson, Sowerby Bridge, slater and plasterer.  
T. Carr, Halifax, painter, &c.

## JARROW.

For Alterations and Additions to the Golden Lion Hotel,  
Jarrow, belonging to Mr. M. Wood, Brewer. Mr. HENRY  
GRIEVES, A.R.I.B.A., Architect, Albany Chambers, South  
Shields.

W. & W. Wylam, Jarrow	£591	0	7
J. Yeeles, Jarrow	581	11	0
D. Lawes & Co., South Shields	547	1	9
A. Smith, Wellington Quay	500	3	4
J. Stovar, Jarrow	488	16	0
S. Sheriff, South Shields	488	0	0
W. Scott, South Shields	469	7	0
E. Anderson, South Shields	464	11	1
Cowper & Henderson, Jarrow	462	10	0
J. C. Nichol, South Shields	455	0	0
J. Hodgson, South Shields	453	10	0
T. LUMSDEN, Jarrow (accepted)	450	0	0

## LEICESTER.

For Building Factory, York Street, Leicester, for Messrs. G.  
Green & Sons. Mr. W. B. SMITH, Architect, Leicester.

J. T. Hallam, Leicester	£1,247	0	0
Chester & Sons, Leicester	1,227	0	0
J. Hutchinson & Son, Leicester	1,200	0	0
T. & H. Herbert	1,199	0	0
F. Major & Son	1,198	0	0
T. BLAND & SONS (accepted)	1,162	0	0

## LITTLEOVER.

For Erection of House, situate at Littleover, near Derby, for  
Mr. T. Ray. Messrs. COULTHURST & BOOTY, Architects,  
Albert Street, Derby.

E. Morley, Derby	£467	0	0
J. Parker, Derby	450	0	0
R. Weston, Derby	411	0	0

## LAWRENCE WESTON.

For Repairs to Mrs. Ogborne's Farmhouse, Lawrence Weston.

T. Gurney, Bristol	£528	0	0
Mogford & Sons, Clifton	500	0	0
J. Baston, Bristol	499	0	0
J. Flowers, Shirehampton	460	0	0
A. Lydford, Bristol	420	0	0
Wilkins & Sons, Bristol	400	0	0
Lovell & Sons, Bristol	350	0	0
G. & J. HEARD, Shirehampton (accepted)	375	16	10
J. Hill, Westbury-on-Tyne	267	0	0

## LONDON.

For Alterations and Repairs at the German Young Men's  
Christian Association, 28 Finsbury Square. Messrs.  
TOLLEY & SON, Architects, 66 Cannon Street, E.C.

Turner	£1,245	0	0
Falkner	1,150	0	0
Smith & Bulled	1,119	0	0
Marriage	1,025	0	0
Waddington	938	0	0

For Painting, and other Works, at the Western Hospital,  
Seagrave Road, Fulham, for the Metropolitan Asylums  
Board. Messrs. A. & C. HARSTON, Architects, 15 Leaden-  
hall Street, E.C. Quantities not supplied.

J. Christie	£900	0	0
Birch & Maylie	396	0	0
F. G. Pinn	369	12	6
W. F. Hadlow	321	0	0
G. A. Collier	320	0	0
W. G. Lilly	317	0	0
F. Henderson	275	0	0
G. Foxley	339	0	0
STEVENSON & CO., St. Paul's Churchyard (accepted)	225	0	0

For Whitewashing, &c., Casual Wards, Mile End.

Matthew	£78	15	6
Gilbey	77	17	0
Brown	73	0	0
Lusk	65	0	0
Catmur	50	0	0
Howley	49	15	0
Judd	49	0	0
CROW (accepted)	44	0	0

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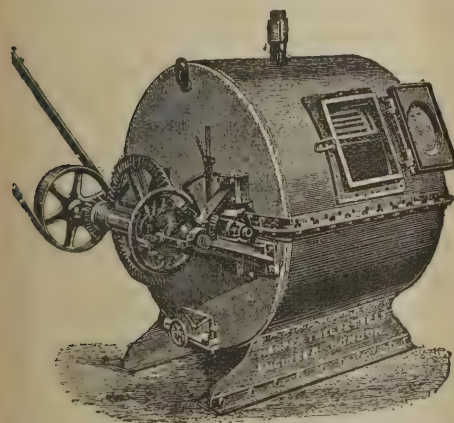
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For Additional Buildings at the South-Eastern Ambulance Station, Old Kent Road, S.E., for the Metropolitan Asylums Board. Mr. T. W. ALDWINCKLE, Architect, 2 East India Avenue.

W. & B. Bardell, Haymarle Road . . .	£7,582	0	0
Staines & Son, Great Eastern Street . . .	7,384	0	0
Brown, Son & Co., Battersea . . .	6,990	0	0
T. Simpson, Borough . . .	6,900	0	0
Brass & Son, Old Street . . .	6,799	0	0
Wall Bros., Kentish Town . . .	6,747	0	0
Ward, Clarke & Co., Atlas Works . . .	6,579	0	0
J. W. Sawyer, Clapham . . .	6,446	0	0
W. JOHNSON, Wandsworth (accepted) . . .	6,320	0	0
G. Stevenson, Bishopsgate . . .	6,200	0	0

## LONG REACH.

For Painting and other Works at the Small-pox Hospital Ships and Buildings, Long Reach, near Dartford, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities not supplied.

W. G. Lilly . . .	£569	0	0
J. L. TRUEMAN, 176 Luton Road, Chatham (accepted) . . .	413	0	0

For Repairs to Manager's Road and Marsh Road, Long Reach, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities supplied.

G. OSENTON, Westerham, Kent (accepted) . . .	£300	0	0
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## NEWSOME.

For Erection of Methodist New Connexion Mission Room, Boundary Walls, and Out-offices at Newsome, near Huddersfield. Messrs. J. KIRK & SONS, Architects, Huddersfield.

## Accepted Tenders.

D. Heaton, Newsome, mason.
J. Liversedge, Berry Brow, joiner.
W. Littlewood & Son, Berry Brow, plasterer.
G. Garton, Huddersfield, plumber.
S. Kendall, Huddersfield, painter.
Pickles Bros., Huddersfield, slater.

## SOUTHAMPTON.

For Construction of Landing Steps at the Town Quay, and Pontoons, Royal Pier, for the Southampton Harbour Board. Mr. J. G. POOLE, Surveyor, St. Michael's Square, Southampton.

Carden, Southampton . . .	£227	17	6
Morgan, Isted & Morgan, Southampton . . .	146	18	0
Roe & Co., Southampton . . .	140	0	0
Crook, Southampton . . .	137	9	6
BULL & SON, Southampton (accepted) . . .	108	12	7
Surveyor's estimate . . .	150	15	0

For Drainage Works, Bellevue Terrace, Southampton. Mr. W. B. G. BENNETT, Borough Surveyor.

A. J. Gould, Southampton . . .	£204	3	8
William Harvey, Southampton . . .	182	0	0
J. Crook, Southampton . . .	175	0	0
J. W. Roe & Co., Southampton . . .	174	0	0
J. Crook & Sons, Southampton . . .	173	7	0
PHELPS & Co., Southampton (accepted) . . .	169	7	0

For Work in Connection with the Removal of the Netley Shoal, for the Southampton Harbour Board.

## Amended Tenders.

J. Shelbourne & Co., London . . .	£19,500	0	0
Ball & Gammon, Stroud . . .	17,000	0	0
J. J. Robson, Westminster . . .	16,731	12	0
A. C. Shonbery, London . . .	15,750	0	0
J. T. Crampton, Portsmouth . . .	13,000	0	0
J. T. Bevis, Portsmouth . . .	12,800	0	0
W. Gannaway, Southampton . . .	12,642	3	9
J. T. Thompson, Chatham . . .	11,900	0	0
E. J. LONDON & CO., Newport, Mon. (accepted) . . .	9,900	0	0

## WREXHAM.

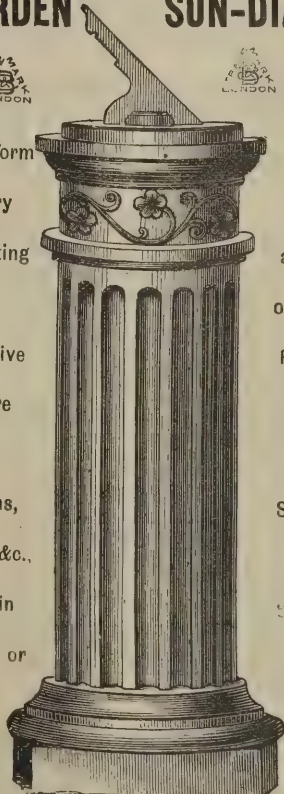
For Building Parsonage House and Boundary Walls, at Rhosddu, Wrexham. Mr. EDWARD JONES, M.S.A., Architect, 12 Temple Row, Wrexham. Quantities not supplied.

R. D. Davies, Buckley, Chester . . .	£1,586	0	0
B. Owens, Wrexham . . .	1,517	0	0
Davies & Sons, Rhosyllen, Wrexham . . .	1,507	10	0
HUGHES & OWENS, Wrexham (accepted) . . .	1,462	9	6

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J. Jackson, Leyton	496	0	0
W. Porter, Hackney	474	0	0
J. Reeves, Walthamstow	467	0	0
J. Mowlem & Co., Westminster	447	0	0
G. Bell, Tottenham	413	0	0
Woodham & Fry, Greenwich	365	0	0

Frederick Street.

J. Jackson, Leyton	210	0	0
J. Jackson, Enfield	195	0	0
J. Reeves, Walthamstow	193	0	0
J. Mowlem & Co., Westminster	192	0	0
G. Bell, Tottenham	177	0	0
J. L. Cattell, Lowestoft	159	0	0
W. Porter, Hackney	154	0	0
Woodham & Fry, Greenwich	136	0	0

Downsfield Road.

J. Jackson, Leyton	286	0	0
J. Jackson, Enfield	275	0	0
G. Bell, Tottenham	267	0	0
J. Reeves, Walthamstow	266	0	0
J. Mowlem & Co., Westminster	259	0	0
Woodham & Fry, Greenwich	239	0	0
W. Porter, Hackney	210	0	0
J. L. Cattell, Lowestoft	187	0	0

Higham Street.

J. Jackson, Enfield	600	0	0
G. Bell, Tottenham	479	0	0
J. Mowlem & Co., Westminster	458	0	0
J. L. Cattell, Lowestoft	440	0	0
J. Jackson, Leyton	398	0	0
J. Reeves, Walthamstow	368	0	0
Woodham & Fry, Greenwich	360	0	0
W. Porter, Hackney	327	10	0

TRADE NOTES.

In a previous issue we gave a description of the "Remington" type-writing machine, and pointed out the many ways in which it would be of great assistance to architects and builders, and also its superiority over its competitors. This we are pleased to see has been demonstrated at a contest of type-writers on July 29 at Cincinnati, where the operator on a "Remington" wrote 8,709 words in 90 minutes, as against 6,938 words on the next best, or an excess of 25.38 per cent. The sole proprietors and manufacturers are Messrs. Wyckoff, Seamans & Benedict, 100 Gracechurch Street, London, E.C.

MESSRS. FRANCIS BARKER & SON, of 12 Clerkenwell Road, E.C., a well-known and old-established firm of scientific instrument makers, have issued a catalogue of horizontal and vertical sun-dials, of which they have made a speciality for a number of years. There is no reason why sun-dials should not be used more generally than they are at present, as with a good architectural pedestal they are a great ornament to any garden, especially when standing on a raised granite platform with several steps; and they of course, when properly fixed, must necessarily give the correct time—a great advantage in country districts, where it is often difficult to set the clocks of the household by any reliable time-piece. Messrs. Barker & Sons make them in a variety of forms and materials, the most durable being in brass.

ALTERATIONS have been made to the Thatched House Club, St. James's Street, S.W., embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air, and the fresh air admitted by Boyle's improved air inlets.

THE new Boys' Public Day Schools, Kentish Town, are warmed and ventilated by means of the Patent Manchester Grates, supplied by Mr. E. H. Shorland, of Manchester and London.

A MEETING of the Birmingham Compressed Air-power Company was held on Friday, when it was stated that there were 3,362 yards of main now laid, and by the end of the week there would be two miles of main finished. The work was being vigorously pushed on in the streets where factories were numerous, and there was every expectation of a large demand for the power. Already it was in use in some of the manufactories, so that shareholders could see it in operation on customers' premises. Some manufacturers were hesitating till the

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pipes were laid in their district, when no doubt they would immediately require connection, so as to be provided with the power from the company's works. It was also mentioned that in Paris there were thirty miles of mains worked with 3,000 horse-power.

MESSRS. E. & W. J. LONGMIRE write to us:—By an oversight our tender for works at West Kensington, for Mr. Alexander Payne (*The Architect*, August 24), has been sent to you for publication as that of "Longmire & Burge." As there has been no such firm for some time past, may we ask you to correct this? the present style of our firm being William Longmire & Co., and the partners E. & W. J. Longmire.

A VIADUCT for the North British Railway over the Earn at Hilton, in the neighbourhood of Perth, has been completed and open for traffic. Much time and trouble was absorbed in securing a proper foundation owing to a deep layer of soft sand, and a depth of 50 feet had to be attained before a solid stratum on which to rise the pillars was reached. Cylinders were then sunk and filled with concrete after the usual fashion, and upon these freestone pillars were built to a height of 30 feet, finished with a massive granite coping, and tested with a weight of 500 tons. The main girders were built on a platform some distance from the site of the bridge, and subsequently moved into position by means of hydraulic jacks. The centre girders are 100 feet long, and weigh about 50 tons. The total length of the bridge is 250 feet, and, irrespective of the pier cylinders, 450 tons of iron have been used in its erection. The foundrywork was done by Messrs. Goodwin & Co., Motherwell, and the building work by Mr. W. Oliver, Edinburgh.

THE Regent Ironworks, Bilston, which have stood idle for several years, have been taken by the Albion Iron Company (Messrs. Lewis, Greenway & Dangerfield), who also carry on business at the Albion Works, West Bromwich, and Batman's Hill Works, Coseley. The Regent Works will give employment to 200 hands.

THE committee for erecting the proposed new church, All Saints, North Moor, Oldham, are taking steps for carrying out the scheme. A plot of land for a site has been given by a resident. The church is to cost 5,000*l.*, and sittings will be provided for between 500 and 600 persons.

THE property in Cross Guns Court, Chester, occupied by labouring classes, requiring improvement, the Duke of Westminster, the owner, has decided to have it pulled down and to

erect in its place a large block of model dwellings in flats. There will be thirty tenements, three storeys in height, each tenement being complete in itself, and having its approach from an open staircase. A large space will be left free all round the buildings to afford light and air. The buildings will be constructed with fireproof floors between the different storeys, and will be of a most substantial character. Washhouses and drying grounds have been erected in the rear.

SATURDAY was observed as the annual holiday by the building and other trades in Dundee. About 1,300 travelled by special trains *via* the North British and Caledonian Railways to the Glasgow Exhibition. Large numbers also availed themselves of the Saturday excursion trains to Perth, Dunkeld, Arbroath, &c.

ON Monday afternoon Mr. W. Grisenthwaite, of Penrith, the contractor for the erection of the new county bridge at Appleby, Westmoreland, met with an accident which it is feared may terminate fatally. He was standing on a scaffold plank superintending the work of laying the foundation of the centre pillar when the plank broke, and he was precipitated into the well beneath.

THE revival of demand in the Staffordshire iron trade has led to a further sale of ironworks for restarting at an early date. The Bromley Ironworks, Brierley Hill, which were stopped some months ago, have been purchased by Messrs. Roberts & Cooper, of Brettell Lane, who own other works in the same neighbourhood. Many manufacturers have secured large orders within the past week, and are now refusing to book anything unless a substantial advance in price is offered; while some of the pig-iron makers have no iron to offer, as customers are taking all the current make.

AT the meeting of the Ayr Town Council on Monday, it was stated that all the properties required for the projected improvements in High Street had been purchased by the Improvements Committee, at prices amounting in the aggregate to upwards of 15,000*l.* It was estimated that after selling the sites of the properties the loss to the burgh would not exceed 1,500*l.*

AT Doncaster on Saturday, the members in the Manchester district of the Institution of Gas Engineers held a quarterly meeting, when Mr. Newbiggin, of Manchester, read a paper on "Gas-holders without Upper Guide Framing," describing a recent invention by Mr. William Gadd, whereby an entirely new principle is introduced, and by the application of which a

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gasholder may be securely guided from the bottom curb, the whole of the elevated framing being done away with, whilst at the same time the strain of wind or snow pressure upon the holder has the effect of producing greater rigidity in the structure.

ESTIMATES, amounting to about 4,300*l.*, have been accepted for the erection of Town Hall buildings in Lockerbie.

THE profits on the gas and water undertakings of the Carlisle Corporation amount for the past year to 8,337*l.* and 4,338*l.* respectively, making a total of 12,675*l.*

UPWARDS of 2,300 miles of main for conveying natural gas have now been laid in the United States. The total capital invested in the business exceeds 50,000,000 dollars.

THE *South-Eastern Gazette* says:—A deputation of the residents in the vicinity of the Butter Market, Canterbury, last week waited upon the Markets Committee to ask that it may not be abolished. One gentleman present said he would be prepared to guarantee anything which might be spent in excess of 5*l.*, a sum which the deputation were confident would amply suffice to carry out the needed work. It would appear from a pamphlet printed in London, 1666, that Mr. John Somner, brother of William Somner, the antiquarian, at an expense of 400*l.* and upwards, "erected and completed a market-house (a piece of such elegance as much commends the architect), consisting of a double storey, divided into two fair rooms apiece, with a pavement of stone underneath, very useful for walking out of market time." The place was called the bulls' stake (from baiting bulls there). In 1789 the building over the butter market, which had been many years used as a theatre, was pulled down, many of the timbers being much decayed, and another building erected by the Corporation, at the expense of 45*l.* In 1821 it was again repaired, and entirely new roofed.

ON Saturday, August 25, a section of the employes of Messrs. Gregory & Co., Station Works, Clapham Junction, held their annual excursion and dinner, leaving Clapham Junction by an early train for Portsmouth. They spent the morning in visiting the Dockyard, Southsea, and other places of interest, and mustered for dinner at Maybon's restaurant. Mr. G. C. Hudson (one of the partners) presided at a very well served dinner, after which the usual toasts were honoured. Mr. Hudson, in reply to the toast of the firm, hoped that the good feeling between all parties, so evident this day, would increase day by day, and not be confined to special occasions

like the present, and that each succeeding meeting might, if possible, find the interest of all connected with the firm more firmly cemented. The party, numbering about a hundred, left Portsmouth at 2.15 P.M. for the Isle of Wight, returning to Clapham Junction *via* Portsmouth, reaching home about 10 o'clock, after having spent a thoroughly enjoyable day.

#### THEATRE ROYAL, YORK.

THE structural alterations designed by Mr. E. G. Mawbey to secure the building against the dangers of panic and fire are being carried out. The pit and gallery were formerly entered from Duncombe Street, but these entrances will be removed, and in future all parts of the building will be entered from St. Leonard's Place. The pit, instead of being entered on the right of the orchestra as formerly, will in future be entered from the back, just under the middle of the dress-circle, the entrance being 12 feet wide. Stairs corresponding to those used for the entrance are constructed on the left side of the door, having been provided as an extra means of exit in case of emergency, which clears on the left of the front of the theatre. The exits now in course of construction will enable the pit to be cleared within two minutes from an alarm being raised. The dress-circle is reached by a wide staircase. On the right of the stairs-landing will be provided a gentlemen's smoke-room and lavatory, and behind that room one of much larger size will be set apart as a ladies' cloak-room, with lavatory and every other accommodation provided. A promenade will be formed just outside the dress-circle. The portion of the building formerly used as a dwelling-house has been completely removed to make room for the staircase leading to the dress-circle and the stairs which ascend to the upper boxes. A promenade will also be formed for the accommodation of the patrons of the upper boxes, and on this landing will also be provided cloak-room, lavatory, and other requisite accommodation. On the right side of the building, and not far from the cloak-room, an emergency exit will be made, leading into the gallery staircase, thus providing two exits, which it is calculated would enable the gallery to be cleared in one minute.

The "green rooms" will be rearranged, the old gallery staircase will be abandoned, and a corridor constructed running along the front of the green rooms, and an emergency exit for the performers has already been provided, so that they can get

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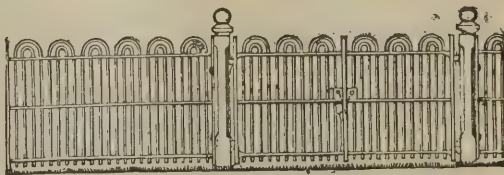
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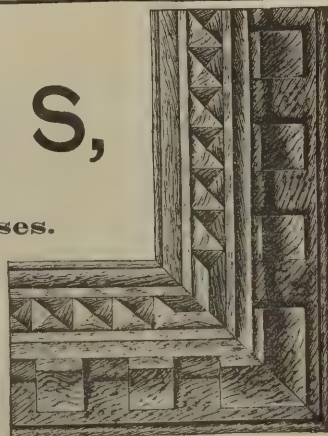
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clear out in a minute, the means of exit being such that they will not come into collision with persons leaving any part of the building. In addition to these, emergency exits will be provided on each side of the stage, and a special exit for the orchestra. In addition to these improved means of entrance and exit, other alterations are being made in the interior. The dress-circle will be refloored with a fireproof flooring. Underneath the dress-circle formerly was a crypt, consisting of a series of arches with short Norman pillars, partly hidden by modern brickwork. This is believed to be a portion of the remains of St. Peter's Church, which was destroyed by fire in 1137. Previously the pit extended only to the front of the dress-circle, but it is now being extended underneath the dress-circle, new iron pillars having been erected. Timbers will go across from one pillar to the other, and the cross beams will be placed in the wall, extending to the front, thus carrying safely the dress-circle. Accommodation will thus be provided in the pit for about 150 more persons, and the floor will be raised at the back so that all spectators will have a good view of the stage. Much of the old crypt still remains, every desire having been manifested not to disturb those relics of the ancient past. The whole of the alterations were designed by Mr. Mawbey, and as he is adverse to winding staircases, the whole of those being constructed are straight steps, and landings formed of hard Yorkshire stone. The whole of the staircases will be fireproof, and the dress circle and upper boxes will be fitted with glass doors and Chubb's patent safety fire doors. The contractors for the work are Messrs. Parker & Sharp, of York, and Mr. Wm. Jenkinson is employed as clerk of works.

Councillor Dr. Ewart, Dr. Newsholme, Messrs. Yates, Ward, Wells, Jolliffe, D. T. Bostel, E. Roberts, D. B. Bostel, Richardson, Lintott, and Harmer. The rules of the Glasgow district were adopted, and the offer of Mr. Councillor Loader for the use of his offices for the company was accepted with thanks. The secretary was authorised to call the Registration Committee on September 7 to consider applications. It was decided to hold public meetings at Lewes, Chichester, Hastings, Eastbourne, Horsham, East Grinstead, Tunbridge Wells, Worthing, and other towns if invited. After the regular business some of the members expressed dissatisfaction with the way gasfitters were allowed to operate on water-pipes, and it was thought that the Waterworks Committee should only allow registered plumbers to tamper with their service, as was the case with the New River, East Kent, and East Middlesex Companies.

#### THE WENHAM LAMP.

FOR some time back, the *Aberdeen Free Press* says, the directors of the Music Hall Company have contemplated an improvement in the gas lighting of the Music Hall Buildings, and recently an interesting experiment was successfully carried out in the lighting of the large hall on the Wenham regenerative gas lamp system. As a preliminary experiment, Messrs. James Milne & Son, of Edinburgh and Glasgow, Scottish agents of the Wenham Company, were commissioned to fit up one of the large-sized Wenham regenerative lamps in the round room. The results, both as to consumption of gas and effective lighting, were considered so satisfactory that the directors requested Messrs. Milne to report as to the adaptability of the Wenham lamp for the general lighting of the Music Hall itself. The plan submitted by Messrs. Milne was the substitution of three groups of Wenham lamps to replace three sunburners at present in use, and it was the first group of lamps that had just been erected in place of the sunburner at the platform end of the hall that was then experimented with. The group, which was fitted into the space over the platform occupied by the sunlight, consists of seven lamps, enclosed in globes similar to those in railway carriages, and resting on an iron fretwork frame, which, however, is invisible from the hall. Each lamp is supplied with flash light tubes, and the lamps are simultaneously lit by turning on a single tap in the gallery. The difficulty hitherto experienced of providing

#### REGISTRATION OF PLUMBERS.

A MEETING of the District Council for Sussex in connection with the National Registration of Plumbers was held at Brighton recently, the chair being occupied by Dr. Ewart, chairman of the Sanitary Committee. The questions of advertising the meetings and registration were gone into by the meeting, and after a prolonged discussion, a resolution empowering the secretary to advertise throughout the country was adopted; afterwards a second resolution to the effect that an arrangement be entered into with the Worshipful Company similar to that entered into with other District Councils was carried unanimously. The following gentlemen took part in the discussion:—

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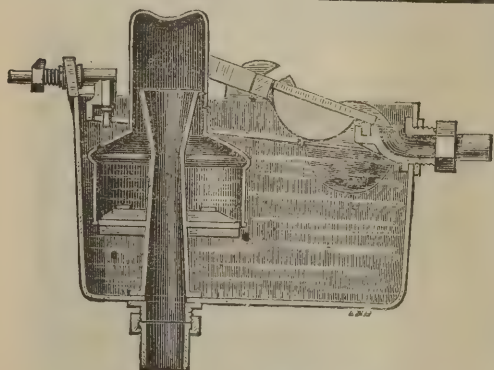
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a ready means of manipulating the lamps in such a lofty interior has in this case been successfully overcome, an ingenious apparatus having been devised by the Messrs. Milne, by which the whole group can be easily lifted for cleaning or repairing purposes. The seven lamps tested are of the largest size, No. 4, and consume each 15 feet of gas per hour, a little over 100 feet in all. The sunlight thus superseded contained 297 burners, and consumed fully 400 feet of gas per hour, so that the saving involved by the adoption of the new system is thus some 75 per cent. Several of the directors of the Music Hall Company, along with Mr. Smith, gas engineer, were present in the hall when the new lamps were tested, and expressed much satisfaction at the result of the experiment. A most effective light was obtained, the brilliancy of the concentrated jets being greatly admired, and the lights being 45 feet above the floor line look from below not unlike a group of large electric lamps. It is probable that the other sunburners will also be replaced by the Wenham lamps.

#### GILCHRIST ENGINEERING SCHOLARSHIPS.

AN entrance scholarship will be offered at University College, London, in the present month. The value is 35*l.* per annum, tenable during two years, and the competition is limited to those who have not previously been students of the college, and who will not complete their nineteenth year before October 1. Every candidate must declare his intention of taking, at least, the two first years of one of the engineering courses, and the second payments will depend upon his success during the first year and the arrangements he makes for the second year's study. The subject of the examination will be mathematics, and any two or more of the following five subjects:—Mechanic, mechanical drawing, an essay on a given subject, French or German, and the use of tools. A senior scholarship of 80*l.* will be awarded at the close of the session. Candidates must have attended college classes in the following subjects during the whole of the session:—Applied mathematics, physics, engineering, engineering drawing, and geology. The results of the class examinations will decide the obtainment of the scholarship, providing sufficient merit has been shown to justify the award. There are also entrance and other exhibitions and scholarships given at University College for mathematics, physics, chemistry, classics, German, French, art, Greek,

Hebrew, jurisprudence and political economy, philosophy of mind and logic, English literature, medicine, surgery, pathology, and physiology.

#### PROPOSED NEW DOCKS ON THE DEE.

IN reference to an announcement that the London and North-Western Railway Company contemplated constructing docks on the Dee, it has been ascertained that this action is taken in opposition to the Manchester Ship Canal. Ships of the heaviest tonnage can cross the bar of the Dee, which is several feet deeper than the Mersey bar, and can steam right up to Mostyn, a distance of ten miles only, where the new docks will be built. There is now a very fair port at Connah's Quay, fourteen miles further along the Dee, in the direction of Chester; but the state of the navigable channel is so bad, owing to sand banks and accumulations, that the shipping interests are much jeopardised. The main line of the London and North-Western Railway from Chester to Holyhead runs within a hundred yards of the proposed docks, and the contention by the railway interest is that ships can be unloaded at Mostyn right on to the railway, and the goods be in Manchester in two hours. Holyhead, where the company already has docks, would not suit, for there is not more than adequate accommodation for their rapidly developing Irish traffic.

#### AN ELECTRIC MOUNTAIN RAILWAY.

THE *Daily News* gives a description of the electric mountain railway—the first of its kind—recently opened to the public at the Burgenstock, near Lucerne. The fact is interesting to tourists because it opens up a charming mountain resort hitherto somewhat inconveniently approached, and it is important because of the novelty and skill which have entered into its accomplishment, and because of the difficulties which have been surmounted. Hitherto it has been considered impossible to construct a funicular mountain railway with a curve, but the new line up the Burgenstock has achieved that feat under the superintendence of Mr. Abt, the Swiss electrical engineer. The rails in fact describe one grand curve formed upon an angle of 112 degrees, and, by an arrangement of wheels for the cars known as the "System Abt," the journey is made as steadily and smoothly as upon any of the straight

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funiculars previously constructed. The Burgenstock being almost perpendicular, it would have been impossible to construct a railway upon the old plan. A bed has been cut for the most part out of the solid rock in the mountain side from the shore of the Lake of Lucerne to the height of the Burgenstock—1,330 feet above its level, and 2,860 feet above the level of the sea. The total length of the line is 938 mètres, and it commences with a gradient of 32 per cent., which is increased to 58 per cent. after the first 400 mètres, and this is maintained for the rest of the journey. A single pair of rails is used throughout, with the exception of a few yards at half distance to permit the two cars to pass.

The motive power, electricity, is generated by two dynamos, each of 25 horse-power, which are worked by a water-wheel of 125 horse-power, erected upon the river Aar at its mouth at Buochs, three miles away. The electric current is conducted by means of insulated copper wires to another pair of dynamos, the negatives of the first, and of the same power, which are installed at the head of the railway. The loss of electricity in transmission is estimated at 25 per cent. The electric force thus obtained is converted into mechanical power with ordinary leather belting, passed to two large driving wheels, then extended by shafting to a set of movable conical cogs, and thence to the big wheel, over which the wire-rope passes. To give the rope adhesion it is wrapped under and over two smaller pulleys, and then for a second time over the larger wheel. Greater steadiness to the cars is at the same time achieved. The arrangements for applying the power are of the simplest character. Only one man is required to manage the train, and the movement of the cars is completely under his control. One dynamo is sufficient to perform the work of hauling up and letting down the cars containing fifty or sixty persons. With a "switch" the conductor regulates the amount of electricity according to his requirements, a gauge similar to the steam gauge of an ordinary boiler, and figured in horse-power, being provided for his guidance. He communicates by electric signals with the man at the water-wheel when the cars are about to commence their journey, and the latter in turn regulates the water-power applied. To prevent jerking or an "over-dose" of electricity, the current passes through a large "case" or "accumulator" placed in the machine-room, and from this the "driver" draws his supply as required. A finger moving along a figured disc before him by means of a millimètre screw at the rate of a millimètre to every mètre of the railway, and one per second—the speed at which the cars run—enables him

to see their exact position on the line at any given moment of the journey, and he can increase or slacken speed accordingly. In addition to this advice, the cars themselves give him a signal at stated points. At a distance of one mètre and fifteen mètres respectively, after the car leaves either the upper or the lower station, the flanges of the wheels pass over an electric plate, and a bell is rung in the machine-room. The same signs are given when they arrive within fifteen mètres and one mètre of the half distance, so that the cars are themselves their own signalmen, and the "driver" knows exactly when to "shut off power." At the end of the journey, completed in about fifteen minutes, at an ordinary walking speed, the car moves gently against a spring buffer, and is locked by a lever, without noise and without jolting the passengers.

The undertaking has been carried out at a cost of 25,000l. The electric power gained at the stream by the water-wheel also lights the whole of the hotel buildings and its grounds by electricity, and when the railway is not working, another dynamo pumps up spring-water 1,000 feet for use in the establishment.

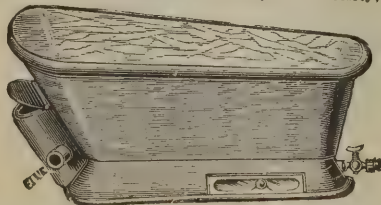
### BRIGHTON AS A HEALTH RESORT.

A PAPER on the sanitary advantages of Brighton was read by Dr. Joseph Ewart, the chairman of the Sanitary Committee of the Brighton Town Council, on Saturday, at the meeting of the sanitary inspectors. The first fundamental advantage the town possessed, he said, was the unrivalled site upon which it was built; it was endowed with so many physical virtues and was impaired by so few defects. It had an admirable fall for drainage. The central parts of the town possessed an alluvial and marly soil, but for the most part there were no buildings erected on it, the main space being devoted to recreation grounds. A chalk basis was to be found east and west of this point, and in consequence the climate was comparatively dry and bracing. The town was greatly benefited by the absence of any low-lying, oozy, or swampy ground in the immediate vicinity; the Downs to the north, the shingle and cliffs to the south; the standing north of the town on chalk cliffs, approaching more or less closely the beach and sea; a southerly or south-westerly aspect, courting an ozone and health-laden prevailing breeze; an unusually large proportion of sunlight, especially during the season, from October to December inclusive, when the metropolis and many of our great inland

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cities are liable to be enveloped in smoke and fog; a moderate mean annual temperature of 50 deg.; greater coolness in summer and warmth in autumn than that of inland towns; a moderate thermometric range of 11 deg.; a rainfall of only 28.87 deg.; a barometric pressure of 29.961 deg., with a range of 2.381 deg.; a humidity of 82 deg., saturation point being put at 100 deg.; very few days in the year in which exercise may not be taken in the open air on the well-paved side walks and promenades. The splendid water supply which the town possesses was next instanced, and it was shown that this was apparently boundless. The population to be provided with water amounted to over 141,784 souls, which, allowing a daily expenditure of 24 gallons a head, would account for 3,402,716 gallons. As regards quality, analysis had shown that Brighton water was absolutely free from organisms, ammonia, and sewage contamination, and possessed "low values of carbon and nitrogen, and just sufficient hardness to give it a pleasant taste." The third advantage Dr. Ewart claimed for the town was its excellent system of drainage and its efficient sanitary department. The whole of the sewage of Brighton, Preston, and Hove was conveyed by means of well-constructed sewers into an intercepting sewer, which had its outfall four miles to the east of the most easterly part of the town, the ventilation of which was promoted by a furnace and shaft at Roedean. In dry weather 4,000 gallons of water were used for flushing purposes. Brighton possessed a fourth advantage in its steadily diminishing death-rate, the figures of which he adduced. The general advantages the town possessed in its unrivalled esplanades, its numerous attractions, its parks and open spaces were also enumerated; and after dwelling upon the necessity of establishing abattoirs and other matters, he concluded:—Brighton, it must be recollected, is purely and simply a great health resort. It is desirable, therefore, that her vital statistics should enable her to compare favourably with other health resorts. Her eminently happy and proud place among the twenty-eight large towns with which she has been bracketed, is satisfactory as far as it goes, but it is not quite sufficient to satisfy the scientific critic. In such a matter this gentleman cannot be disregarded. What is really required, he naturally declares, to secure the town against all risk and to make her prosperity certain and perennial, is, by an extension of sanitation in the direction indicated, to confer upon her a corresponding pre-eminence over her genuine rivals in this country and elsewhere. That this can be done has been amply proved by the advance which has been made during the last half a dozen years.

## METROPOLITAN RAILWAY.

THE company are about to rebuild the St. John's Wood Station at Baker Street, and also to widen and enlarge the old station in Marylebone Road, Baker Street. The works will involve the temporary stoppage of the road, to which the Vestry have consented in order to enable the contractor to place the iron girders carrying the roof in position. This portion of the works is expected to be completed in about a month. The old station is to be widened on both platforms, by which the passengers from the Rickmansworth branch, instead of having, as they now do, to traverse the whole of the building, will merely walk through a short passage into their train. An additional bridge will also be thrown over the station to connect the St. John's Wood line with the west end side of the station, and passengers to the City trains will be given greater facilities for reaching their destination by the widening of the up-platform.

## NEW THEATRE, LONGTON.

AT a special sessions of the Longton justices on Tuesday, Mr. G. C. Kent appeared on behalf of Mr. James Elphinstone, and applied for a license for the performance of stage plays, &c., in the new building now approaching completion, and to be known as the Queen's Theatre. He said that from the plans to be submitted it would be seen that the theatre consisted of a basement containing the dressing and other necessary rooms underneath the pit and the stage-well, and also the pit bar, leading by a broad staircase to the pit overhead. The pit itself was a large one, placed upon a fireproof floor composed of iron girders and solid concrete. It would be almost impossible for a fire to take place in the pit, or, in fact, in any part of the auditorium, the object of the promoters having been not so much to put out fire quickly as to prevent its occurrence altogether; and that object had been carried out as far as practicable. There was a wide entrance to the pit, and other convenient arrangements, for by the doors in Chancery Lane it was possible to throw nearly the whole length of the pit open by the use of a lever, so that it could be cleared in a very brief space of time. In front of the ordinary pit there was a number of stalls to which a separate entrance was provided, and, in case of panic, the occupants would be able to get into the street immediately. Over the pit were the circle and upper circle,



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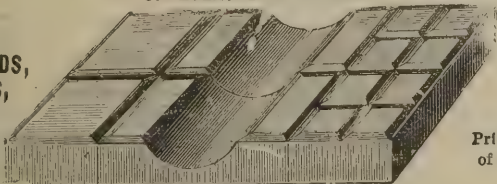
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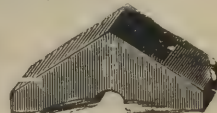
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**HAMBLET'S PATENT MACHINE-MADE BRINDLED BRICKS.**



and at the top of the house was the gallery, each provided with a stone staircase. In fact, all the inside staircases, with the exception of that in the grand entrance, where little or no risk was apprehended, were composed of stone. There were two entrances to the circles, and a separate entrance to the different galleries; and, in addition to the entrances, there were means of exit above the requirements of the theatre. The staircases alone would contain all the people the theatre would accommodate, which was a very important feature, because in case of a panic the stairs could hardly become so congested as to leave a number of people in the body of the theatre. All corners in the stairs had also been rounded, so that no person might get stuck in one of them. The magistrates decided to grant the license. The theatre has been erected from the plans of Mr. John Taylor, architect, Longton, by Mr. T. S. Bromage, builder, Longton, the contract price being 12,000*l*. Accommodation is provided for 3,000 persons.

### TRADE IN AMERICA.

A STATISTICAL report for 1887 has been prepared by Mr. David T. Day, Chief of Division of Mining Statistics and Technology of the United States, from which the following is taken:—

**Building Stone.**—Direct returns from producers show a total value of 25,000,000 *dols.* This marked increase shows that the statement for 1886 was too small.

**Brick and Tile.**—Value 40,000,000 *dols.* This represents an increase of about 13 per cent. in the production of brick and a decrease in tile, owing to the drought in 1887 in Indiana and Ohio. Prices were slightly lower.

**Lime.**—The production is estimated at 46,750,000 barrels, with an average value of 50 cents. per barrel.

**Cement.**—The production of cement from natural rock was 6,692,744 barrels, valued at 77½ cents per barrel, making 5,186,877 *dols.* as the value of the year's product.

**Iron.**—Domestic iron ore consumed, about 11,300,000 long tons; value at mines, 33,900,000 *dols.* This is an increase over 1886 of 1,300,000 tons in quantity and 5,900,000 *dols.* in value. Imported iron ore consumed, 1,194,301 long tons; total iron ore consumed in 1887, about 12,494,301 long tons, or 1,454,868 tons more than in 1886. Pig-iron made, 6,417,148 long tons; value at furnace, 121,925,800 *dols.* This is

an increase over 1886 of 733,819 tons in quantity and 26,730,040 *dols.* in value. Steel of all kinds produced, 3,339,071 long tons, an increase of 776,569 tons over 1886; value at works, 103,811,000 *dols.* Total spot value of all iron and steel in the first stage of manufacture, excluding all duplications, 171,103,000 *dols.*, an increase of 28,603,000 *dols.* as compared with 1886. Limestone, used as flux in the manufacture of pig-iron in 1887, about 5,377,000 long tons; value at quarry, about 3,226,200 *dols.*

**Gypsum.**—The condition of the industry is practically unchanged. The estimated total product was 95,000 short tons of crude gypsum, valued at 425,000 *dols.* In addition, 162,154 long tons of crude gypsum were imported, chiefly from Nova Scotia.

**Flint.**—For pottery, 19,800 tons were used. Including the use for sand-paper and in glass manufacture, the total consumption was about 32,000 tons—worth, unground, 185,000 *dols.*

**Potter's Clay.**—The consumption of kaolin and ball clay by potters aggregated 28,000 tons, valued at 290,000 *dols.* In addition, the potters used 15,000 tons of fireclay, worth 50,000 *dols.*

**Mineral Paints.**—Including ochre, metallic paints, and small quantities of umber and sienna, the production amounted to 20,000 long tons, selling for 310,000 *dols.* at the mines.

### PROPOSED BRIDGE AT NEW YORK.

A SUSPENSION bridge is proposed to be built by Mr. Gustav Lindenthal, bridge builder, of Pittsburg, Pennsylvania, for railway traffic and other purposes, across the Hudson River between New York City and the north New Jersey shore. The Bill has been introduced in both Houses of Congress. According to the plans the bridge will cross the river in a single span, 2,860 feet in length. This is 1,250 feet longer than the largest span yet known (the Forth Bridge, which has two spans each 1,710 feet long), and exceeds that of the Brooklyn or East River Bridge by 1,310 feet. The structure will be similar in its main features to the East River Bridge, except that there will be double cables, one set below the other. There is to be a double tower on either side of the Hudson, with a single span suspended from cables. The length of the middle span is to be, as stated, 2,860 feet from centre to centre of the towers,

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### GRUNDY'S PATENT WARM-AIR VENTILATING FIRE GRATE.

The novelty, superiority, and advantage of this patent consist in the heating surface being greater than any other Fire-grate introduced to the public. It is very simple in construction, and is made in the form of a Stove, the back of which is semicircular in shape, with gills behind and smoke-nozzle on top, all cast in one piece. The same can be attached to any design of a Register or Stove front. It is very suitable for schools, classrooms, waiting-rooms, hospitals, offices, dormitories, and dwelling-houses, from the cottage to the mansion. Design and specification post free on application.

#### TESTIMONIALS.

9 Victoria Chambers, Westminster, S.W.  
SIR.—I have much pleasure in testifying to the efficiency of your patent warm-air fire-grate. It has been very successful, and given every satisfaction where I have used it.

Yours, &c., JAMES WEIR, F.R.I.B.A.,  
6 John Street, Bedford Row, W.C.

From ARTHUR W. BLOMFIELD, M.A., Esq., Architect,  
28 Montagu Square, London, W.

Mr. Grundy, of Tyldesley, near Manchester, has carried out his plan of warming in several churches built under my direction, and in each case it answers remarkably well, and has given great satisfaction.

From Professor W. B. ROBERTSON, M.D., West Dulwich, S.E.,  
September 1, 1887.

DEAR MR. GRUNDY.—I value your apparatus very highly indeed. I regard it as the greatest comfort I have in this house.

From Rev. A. FERGUSON SMYLY, Dean of Derry, The Deanery,  
Derry, September 16, 1887.

DEAR SIR.—I cannot refuse to give you a few words of commendation as to the apparatus you supplied for heating Derry Cathedral. Not only is the air of the Cathedral quite pure and pleasant to those attending the services, as it must be from the fact that most of the air heated is taken from the outside, but I find the building itself is so much benefited, as formerly it was damp and smelt damp, but now it is very dry and free from any musty smell. I find that, although the Cathedral is now much larger, the cost of firing is much less.

To Mr. John Grundy, 30 Duncan Terrace, City Road, London.

From Hon. and Rev. G. G. C. TALBOT, M.A., Withington,  
Cheltenham.

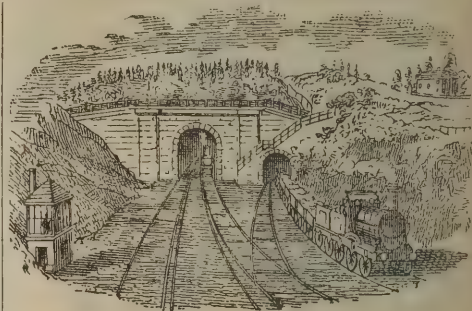
DEAR SIR.—You will be gratified to hear that the school is completely warmed by your new grate. It is the most economical and efficient that I have ever seen.

Mr. John Grundy.

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and the length of each of the end spans 1,500 feet, making a total, including the anchorages, of nearly 6,500 feet. The towers are to be 500 feet high, and to stand on masonry piers 340 feet by 180 feet, reaching 25 feet above high water, with foundations on rock. The towers are to be of wrought-iron and steel, and to consist of sixteen columns each. These columns are to be constructed of angles and plates; they will be octagonal in shape, and tapering from 7 feet in diameter at the base to 5 feet at the top. The columns are to be strongly braced together inside by heavy bracing, and outside by lattice filling. The anchorages are to be each 320 feet by 180 feet, and 210 feet above high-water line. Six tracks of railway are to pass over the bridge, and through a tunnel in each anchorage. The cables are to be 50 feet apart, and strongly braced together to resist the deforming effects of heavy loads. Each cable will have a diameter of 4 feet. The steel wires forming the cables are to be enclosed in steel envelopes to protect them against the weather. An air space of 2 inches is to be left between the steel envelopes and the wire for the better protection against heating by the sun, and to prevent unequal temperature effects. For ordinary traffic the proposed bridge, it is estimated, would be strained only to about 10 per cent. of the maximum load for which it is designed. The elevation of the span above the level of ordinary high water would be 140 feet in the clear, exclusive of the deflection of the superstructure from loads or the effects of temperature.

## PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

## APPLICATIONS FOR PATENTS.

11889. Ellen Wilkinson, for "An improved window fastener." August 17, 1888.  
11896. Moses Piper, for "Improvements in instruments for measuring angles." August 17, 1888.  
11908. Walter Stock, of the firm of Stock, Sons & Taylors, for "Improvements in flushing water-closets, urinals and other places." August 17, 1888.  
11909. James William Tyler Stephens and Robert Clark,

for "Improvements in the manufacture of Portland cement." August 17, 1888.

11954. W. T. Elliot, for "Saving life from fire." August 18, 1888.  
11961. J. Sleigh, for "Improvements in grids or stretch traps for streets, &c." August 18, 1888.  
11994. J. Cundall, for "Damp-proofing for walls and foundations of buildings." August 20, 1888.  
11991. J. W. Saunders, for "Improvements in racks for window-blind cords." August 20, 1888.  
12055. C. K. Steane, for "Improvements in window sashes and frames." August 21, 1888.  
12061. Miles Smith, for "Improvements in chimney-tops, pots and cowl." August 21, 1888.  
12107. J. H. Bean and W. Gaines, for "Improvements in apparatus for closing doors and preventing slamming-to of the same." August 22, 1888.  
12141. James Pike, for "Producing and repeating automatic flush." August 23, 1888.  
12173. Charles Young, for "An automatic bolt for double doors." August 23, 1888.  
12182. Richard Stephens and William Charles Stephens, for "Improvements in apparatus or machinery for drilling rocks and other hard substances." August 23, 1888.  
12188. Thomas Cain, for "Novel means and appliances for economising fuel and for increasing the heating properties of the products of combustion in furnaces; also for preventing the escape of black smoke." August 23, 1888.  
12192. Theophilus Lessy Hargreaves, for "An improved safety window fastening." August 23, 1888.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

4123. Alfred James Little, for "An improved system of drainage and flushing." March 17, 1888.  
7883. James Harold Barry, for "Materials for use in the purification of sewage." May 30, 1888.  
9288. Hugh Lyons, for "Improvements in polishing or enamelling and ornamenting wood, cement, and other substances." June 26, 1888.  
9803. Alfred James Hogan, for "An improved method of building and construction, to facilitate escape from fire." July 5, 1888.  
9832. Joseph Cordingley Wilson, for "Improvements in ventilating cowls or shaft tops." July 6, 1888.  
10177. Joseph Samuel Horton, for "Improvements in raising

## H. W. COOPER &amp; COMPANY, LIMITED,

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Manufacturers of Cooper's Glass, Revolving, Circular, and Sliding Ventilators (H. W. Cooper, Sole Inventor).



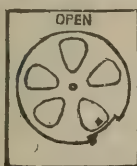
MEDAL AWARDED, 1884.



Improved Glass Louvre Ventilator.



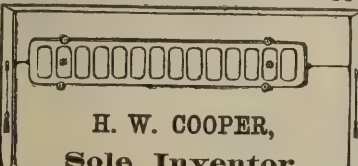
Improved Casement.



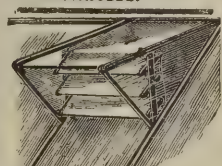
Circular Glass Revolving Ventilator.



SHUT.

H. W. COOPER,  
Sole Inventor.

Glass Sliding Ventilator.



Improved Hopper for Skylights.

SHUT.



Improved Glass Louvre Ventilator.



MEDAL AWARDED, 1876.



Hopper Ventilator.



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and supporting Venetian blinds, and other similarly accumulating weights." July 13, 1888.

10550. John Pullar, for "Improved safety lock-fast gear for actuating fanlights." July 21, 1888.

11029. Ann Knevet, for "Improved apparatus to be used in connection with domestic firegrates." July 31, 1888.

11155. Arthur Hugo Harrison, for "Improvements in such shovels as are used for removing fluid matter from one place to another." August 1, 1888.

11372. Thomas William Aylesbury and James William Russell Wall, for "Improvements in service and cistern cocks for automatically preventing the waste of water." August 7, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of this journal, give notice at the Patent Office in the prescribed form of such opposition.

12379. James Duckett and Alfred Duckett, for "Improvements in and relating to waterclosets using waste or slop water." September 13, 1887.

13180. John Hargreaves, for "Improvements in the manufacture of cement." September 29, 1887.

13193. John Martin Stanley and Thomas Blakemore Stanley, for "Improvements in the structural means for extinguishing and preventing the spread of fires in theatres and other buildings." September 29, 1887.

13740. Claude Marius Duplany, for "Improvements in and connected with fireproof curtains for use in theatres and other similar buildings, and in the construction of such buildings for preventing the spread of fire and smoke therein." October 11, 1887.

14281. James Bazeley Petter, for "Improvements in fire-places." October 20, 1887.

14431. John Walter Gibbs, for "Improvements in exit-ventilators for rooms and other places where down-draughts are to be avoided and noiselessness is a desideratum." October 24, 1887.

6995. James Johnston, for "Improvements in hot-air stoves." May 10, 1888.

10358. William Robert Lake, for "Improvements in heating apparatus for dwelling-houses, factories, and the like." July 17, 1888.

#### PATENTS SEALED, AUGUST 24, 1888.

9815. Alfred Hamilton and Douglas Hamilton, for "An improvement in cowls or wind-guards." July 12, 1887.

10493. Henry Alonzo House and Henry Alonzo House, jun., for "Improved combined door-spring and buffer, applicable also to shutters and the like." July 28, 1887.

10858. John Gill, for "Improvements in machinery or apparatus for the manufacture of pottery, pressing bricks, and the like." August 8, 1887.

11509. Henry Warrington and William Willshaw Howlett, for "Improvements in bricks and other blocks for building purposes." August 24, 1887.

#### NOTES ON SPECIFICATIONS RECENTLY PUBLISHED.

"Improvements in condensation gutters, metal weatherings, and doorstep plates." No. 5548. 1888. R. A. English, builder, London Road, Stroud. An invention concerning the manufacture of metal gutters for collecting the condensation water from interior of windows, doors, and the like, and conveying the same by means of metal tubes to the outside. This invention also applies to roofs glazed by "The Don" system, and to a combined weather step-plate, a draught stop-gutter and linoleum fastening.

"Improved apparatus for forming manholes and other openings in metal plates." No. 9507. 1888. Peter Mitchell, Greatham Terrace, West Hartlepool. This invention relates to the improved means for facilitating the formation of manholes and other openings in boiler, tank, and other metal plates.

*Claim 1.*—Apparatus for forming openings in metal plates, comprising a knife or punch and a block or die, which are adapted to be rotated to cause the knife or blade to correspond with the margin of the hole to be cut, the said knife or blade having a projecting portion extending into a hole or slot in the block, so that the latter shall move with the knife or blade for the purpose specified.

"Revolving door post or other revolving posts for public buildings and theatres." No. 13258. 1887. W. H. Dutton, Englefield House, 258 Oxford Road, Gunnersbury, W.

*Claim 1.*—Revolving posts that can be fixed to doorways, corridors, passages, newels of staircases, or other places of ingress or egress of public or private buildings.

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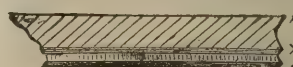
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### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIRs.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 32 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIRs.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly,

To Messrs. Griffiths Bros. & Co., London.

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PALL MALL GAZETTE, June 20, 1887.

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# The Architect.

## THE WEEK.

A LONG experience as a witness in law courts and Parliamentary Committee-rooms has developed Sir FREDERICK BRAMWELL'S power of exposition, and now he has few rivals as a public lecturer. His address as President of the British Association on Wednesday was a masterpiece in its way. Remembering the rank of many of his predecessors in the chair, and how often they startled the world with announcements of discoveries, Sir FREDERICK with his usual tact proposed to talk about "The Importance of the Next to Nothing," and that subject might be said to lead to the "Eulogy of the Civil Engineer," who has so often utilised materials of which the value would be described by a cipher. It will be observed that in talking of the standing engineering works the President placed "buildings" in the foremost place. He did not define their class; but if they are of the customary railway-office type, Sir FREDERICK might well put them under the "Next to Nothing" category. The poetry of engineering was suggested in regard to lighthouses and great bridges, but where is the poetry in the Cannon Street and Charing Cross sheds, which spoil two of the best of the London views?

STUDENTS of architecture who live in London cannot complain of a scarcity of facilities for increasing their knowledge, and the fees to be paid could hardly be lower. For two and a half guineas Mr. HARVEY will give thirty lessons on the geometry of stone-cutting at the City and Guilds Institute, and the sum includes materials and tools. The value of his teaching is no longer questionable, and the students who have gone through the courses will acknowledge that construction assumes a new interest for them. Architects will find the advantage of insisting on the attendance of their pupils at the lectures. In the City of London College Mr. HENRY ADAMS and his staff will give lectures on technical drawing in relation to building, on building construction, strains in ironwork, surveying and levelling, quantity taking, and laying out estates. As in the other classes of the college, the fees are moderate, varying from 6s. 6d. to 3l. 3s. per term. Glasgow is also in rivalry with London. The programme of the Glasgow and Western Engineering College includes lectures on building construction by Mr. GOURLAY, and by arrangements which are matured it will be easy for students to join in any classes of the college which are connected with building.

AN exhibition of pastels is to be held in the Grosvenor Gallery, and it may be concluded that the art will soon come again into favour in this country. It is to be hoped that the splendid full-length portrait by M. ALFRED STEVENS which was seen last year in Brussels will be borrowed, for it is the finest pastel that was produced of late. It will be easy to obtain many examples by impressionists to whose manner of working pastel is suited, but a greater depth of colour is obtainable by artists of other schools. The fleeting nature of a pastel is exaggerated. Under glass one will last as long as a painting in oils. Sir COURTS LINDSAY should also try to obtain some of the pastels by LA TOUR and other masters and mistresses of the art in the last century.

THE Prefect of Police in Paris has issued stringent regulations for the safety of the theatres. Henceforth the control of the buildings, so far as regards precautions against fire, will be entirely in the hands of the police. The firemen, or *sapeurs pompiers*, will be on duty from two hours before the performance until one afterwards. The men will not be allowed to leave the theatre or to see any stranger during that time. On arriving, the chief of the detachment with the director or his representative will make an examination to see that all things provided to insure safety are in working order. The men will be then

placed in different parts of the house, the duty of the chief being to patrol the building. The men are to be careful to prohibit any act which might cause danger. The chief is to test the hydraulic apparatus in order to ascertain that the water is available at full pressure. After the representation there is to be a second thorough examination of the premises. Firemen and employés are to consider themselves as under the Commissary of Police and are to obey his orders. If the directions are carried out with military exactitude little danger can arise to the spectators in any of the theatres.

It is to be regretted that some of the municipal authorities in Belgium, when they were feasting our Lord Mayor, did not ask his lordship how much was expended on art by the great Corporation of London. This week a return of the city accounts has been issued. The expenditure amounts to 881,533l. 13s. 4d. Out of all that sum how much represents art? The Art Gallery is put down at 583l. os. 8d., which means the salary of the officials, and not outlay on pictures. The replica of the statue of Queen ANNE, opposite St. Paul's Cathedral, cost 936l. 10s. 6d., and thus less than one thousand pounds is all that could be afforded out of the enormous revenue of the City. The Lord Mayor should be able to draw a contrast between London and Brussels as patrons of art, and a speech on the subject from him would be a recognition of the sacrifices which are borne elsewhere in order to elevate the people.

MR. G. H. BOUGHTON, A.R.A., has agreed to deliver the prizes and to address the students of the Birmingham Municipal School of Art on February 19 of next year. Among the special lectures which are to be delivered during the session are the following:—Three lectures on "Pompeian Architecture and Art," by Mr. WHITWORTH WALLIS; five lectures on "The Anatomy and Movements of Quadrupeds, as exemplified chiefly in the Dog," by Professor BERTRAM C. A. WINDLE, M.A., M.D.; and one on "The Application of Natural Foliage to Decorative Design," by Mr. ARTHUR B. CHAMBERLAIN. During the past year, 2,398 students attended the central or branch schools of the town.

THE new number of the *Scottish Art Review* is varied in its contents this month. Two of the illustrations are taken from the Glasgow Architectural Association Sketch Book, and the selection of such subjects denotes that architecture will not be neglected by the editor. Another illustration is a reproduction of the portrait of Queen MARY of Scotland belonging to the Archbishop of Glasgow. There appears to be little doubt that the original is one of the few works of the kind which can be considered as authentic. But it serves to correct the delusions about the beauty of the Queen. A fourth illustration is from a picture by Mr. M'TAGGART, but it cannot be taken as a success. The first article is by Mr. WALTER CRANE, who maintains that under a system of socialism we should find many artists of the type of DÜRER and HOLBEIN. Mr. BALDWIN BROWN discourses on the need of "some bond which may bind artists old and young more closely together." Mr. PATERSON recommends painters to give more attention to French art. An article on the competition for the S.S.C. Library points out the bad management, and the unsuitability of most of the designs, the selection being guided by "inscrutable reasons." An impartial article on the Municipal Buildings of Glasgow ascribes the disappointment which is felt on seeing the building to the preponderance of horizontal lines, the lack of refinement in the details, the faulty fenestration, and excess of sculpture. Articles on music and literature complete a number that is nowhere dull.

A BROCHURE, entitled "Notes on Architectural Relics in Cornwall," has been brought out by Mr. H. P. BURKE DOWNING, which he is allowed to dedicate to Mr. RUSKIN. It contains many boldly-drawn sketches, plans of churches, and in the letter-press interesting notices of the buildings are given. It will be an useful companion to any tourist who intends to visit the picturesque district of Cornwall.



## GWILT'S ENCYCLOPÆDIA.\*

IT is, we believe, not easy to decide where encyclopædias in single volumes originated, but Messrs. LONGMANS can claim the credit of being the only publishers who have attempted any rivalry with the French in the production of works of that nature. Fifty years ago, when the series was contemplated, architecture was exciting some attention in England, but few publishers would venture on the experiment of producing a volume so costly as was "GWILT'S Encyclopædia" in its original form. The companion volume on "Civil Engineering" was almost as notable an example of the publishers' enterprise, for when it was commenced the work of the engineer was not defined, and owing to the impetus which came from the extension of railways in England it was almost impossible to keep pace with the development of the engineering profession. The things which were written about one day might be obsolete on the morrow. At the time of its publication there was much in "CRESY'S Encyclopædia" which appeared antiquated, and the publishers seem to have given up the hope of making the book representative of modern practice.

Architecture, on the contrary, is generally supposed to be one of those arts in which little progress can be expected. Every one who poses as an authority will be found to maintain that architecture attained perfection in one or other period of the past, and the whole duty of a student is to turn his attention backwards, as if the laws of art had been revealed once and for ever. JOSEPH GWILT seems to have had a sort of belief of that kind, and as his Encyclopædia corresponded with the art, it was to be taken as a standard that would serve for generations. He does not appear to have contemplated revisions of his volume. It contained, he said, all the knowledge that was indispensable for the practice of an architect, and from the care bestowed on its preparation many errors and defects were not likely to be pointed out. But as it is absurd to imagine that architecture, like theology, is not progressive, it would be vain to hope that any book which professed to be an encyclopædia of the art could serve for more than a limited period. From the time it was placed in the hands of Mr. WYATT PAPWORTH the "Encyclopædia of Architecture" has been subjected to many alterations, and—what would probably horrify the original author—parts have been set aside to make room for additions. The work of the editor will not be apparent to the majority of the readers of the volume, but we hope it may be indicated by means of corrected volumes and proof-sheets for the information of students hereafter. If seen in a museum it would be evident that few works have undergone so laborious a vamping.

An advertisement announces the alterations by which the new edition differs from the one published in 1876. In addition to general emendation, "the chapters on Materials used in Building" and "Use of Materials" have been partly rewritten, especially as regards fireproofing and sanitary construction. The section on "Specifications" has been recompiled and enlarged; "several sections of the chapter on Public and Private Buildings have been withdrawn." The lives of eminent architects have been brought down to date, the list of publications relating to architecture has been extended and rearranged. Additions and excisions are nearly balanced, for the new volume is only about fifty pages thicker than its predecessor. Among the sacrifices is the short memoir of JOSEPH GWILT which used to be prefixed to the volume.

It should not be overlooked when estimating the difficulties of the revision that Mr. WYATT PAPWORTH has had to deal with stereotyped plates, which are not easily altered. In the second place, the paragraphs throughout the book were originally numbered, and the addition or removal of one paragraph would entail a renumbering if another means had not been devised. In many cases additional paragraphs are marked by letters, but when some are deleted, for which corresponding substitutes cannot be introduced, it is not easy to fill up the gap. Thus in the division of the Encyclopædia which relates to history, a memorial of about 250 suppressed paragraphs is still found in this form, "627-873." We here, with regret, leave the

subject, because we have already trespassed beyond the limits prescribed—an explanation which would be as puzzling to a German as was the formula of the Courts, "Make a rule to show cause why."

It is impossible to give a history of architecture from the earliest times in the space assigned to the subject in the volume without omitting many things of great importance. The revision can hardly be said to apply to the first part. The principal additions of the editor are the dimensions, &c., of the new cathedrals of Truro, Southwell, St. Albans, also of Bath Abbey and Westminster, which extend the "tabular views" of the early editions. Judging by the section, the history of English architecture came to an end with the reign of George III. It is not, then, surprising that modern work in other countries is ignored. As regards the explorations of late years in Greece and Italy, which a historian might be expected to utilise in some way, the encyclopædists are silent about them.

In the second book, the sections on geometry and mechanics appear to be unaltered, and likewise those on piers and vaults, walls and piers. In the section on beams and pillars, the paragraphs from 1614 to 1627b in the edition of 1876 are omitted, together with the numerous tables giving the results of BUFFON'S experiments on "pieces of timber" and oak. No one will regret the loss. The experiments, it is true, were conducted with the utmost care, at the expense of the French Government; but as the dimensions were recorded in French measures, they could not be readily utilised in England. It is true they were reduced into decimals, but it would take time before one could discover the relation between a French beam measuring 17.056 ft. x 6.396 in. x 6.396 in. and any English beam of approximate size. Mr. GWILT ought to have recognised that tables of the kind were practically useless in England; but his excuse would be that they were French, for he accepted anything that a French scientist might say about construction as infallible. We suppose it must be owing to the difficulty of patching the pages that Mr. WYATT PAPWORTH felt obliged to introduce a paragraph about the effect of the weather on the Britannia Bridge in this way:—"Of all the circumstances tending to invalidate theoretical calculations the sun is about the worst"! There was no invalidation at the Menai Straits, for precautions were taken, as in all iron bridges, so as to allow the expansion; and there is no reason why an architect, if he has to employ beams that are exposed to great heat, should not also have prudence. One of the Institute examiners might talk so loosely, but Mr. WYATT PAPWORTH is supposed to be writing for the instruction of students, and should be guarded in suggesting that calculations, or, in other words, foresight, are useless, since there are circumstances to invalidate them. In the next edition we hope to find a more apposite paragraph, or a different introduction to the extract from Mr. CLARK'S book. Another piece of confusion in the new edition is seen in paragraph 1,629f, which begins with an account of rolled girders rivetted together. In it the student is informed that the constant for a plate girder with angle irons is 60, although in paragraph 1,629b the constant is given as 75. Then information is given about market lengths of rolled girders, and immediately afterwards it is stated that "the opinion is gaining ground that most of the constants in use for calculating the strength of beams are too high." This statement is enough to take away one's breath, for the numerous investigations of the strength of iron beams were supposed to impart certainty to our knowledge of iron construction. But it is soon discovered that the editor is referring to timber beams. Apparently, in filling up the pages, a paragraph that rightly belongs to some other part was inserted because it happened to fit, size not relevancy being the desideratum. An addition to the section is upon the use of steel in building, and tables by Mr. DAWNAY and Mr. MORELAND will suggest the relative strengths of rolled iron and steel joists.

In the chapter on stone there is a detailed description of the stones belonging to the Bath Stone Firms, Limited, and of others which are now in favour, such as Ancaster, Chilmark, Spinkwell, Minera, &c. No new means would appear to have been made known for the preservation of stone, unless we accept the metallic cement of M. TABARRY, which is not so much a preservative as a substitute for

\* *An Encyclopædia of Architecture.* By Joseph Gwilt. New Edition by Wyatt Papworth. Longmans, Green & Co.



stone which has decayed. The additions to the list of artificial stones are the Victoria Stone and the Leopold Foreign Rock Asphalte. Marble has of late come into more favour, but the only additional information upon the subject in one part of the new edition of the *Encyclopædia* is a paragraph about the various kinds derived from the Massa Carrara Quarries. In another place more is said about the use of marble.

There is nothing in this edition which will add to our knowledge of timber, although much information is available about Australian and New Zealand woods. The problem of the preservation of timber remains as before. Iron is more fortunate, as there is BARFF'S magnetic oxide, which acts efficiently. Some of the new varieties of bricks are mentioned in the section on bricks, but as the material is now so largely used the subject would bear a more lengthened treatment. In the last edition one paragraph was supposed to be adequate to convey information about terra-cotta. A few pages are now devoted to it, which may be taken as a test of its increase in importance.

The editor has this time recognised that drainage is essential for a house when it has to be occupied, and consults other oracles besides LEON ALBERTI. A very good abstract is given of the latest notions on the subject. The part on fireproof construction is also enlarged, and several of the new systems are described. It is remarkable to find in this part of the volume that Mr. WYATT PAPWORTH is not aware of the name of the architect of the new National Liberal Club, and gives the credit elsewhere.

It would be impracticable to add much to the pages on carpentry, but under the head of joinery there are opportunities to describe such aids as fixing blocks, solid wood flooring, wood tapestry, &c. Plumbry of late years has given rise to more inventions than the remaining branches of the building trades, and the editor gives the names of most of the new appliances, and suggests the qualities of many. Plastering has also its novelties, which are duly noted. A chapter has to be given to electric lighting, and those on ventilation and warming will enable the student to realise how far practical science has come to the aid of the builder.

The Specification has been elaborated, but it would have gained in clearness if the parts which are advisory were in a different type to clauses which can be reproduced. In the part on Estimating several of the old pages exemplifying PETER NICHOLSON'S scientific system of discovering the proportionate difficulty of work are wisely left out. Not much was gained by knowing that a foot run of bedded plates in roofing occupied '008 days.

The pages on "Beauty in Architecture" would have borne further revision. For instance, who can now discover what is meant by a passage like this:—"Within the short space of even a few months we have seen what is called the *Renaissance* style of architecture imported from France, drawing into its vortex all classes of persons, many of them among the higher ranks possessed of education to have patronised better taste." The passage must have been written in the days when fear of the French Revolution overshadowed good citizens. There is also a touch of snobbishness in talking of the necessity of "an intimate acquaintance with the habits of the upper classes of society," which suggests the standard of æsthetics admired by Mr. GWILT, but which will not serve in our time.

The whole of the pages about the Orders and details of Italian Classic remain as before. CRESY'S "Essay on Proportion," which was taken bodily from the "Encyclopædia of Engineering," continues to be the guide on one of the most delicate of subjects. The safety of theatres has caused the compilation of a few additional paragraphs.

The "List of Architects" in the edition of 1876 terminated with the name of TITE. Forty names have been added, comprising several which will always be remembered. But the scale of recognition is incomprehensible. Sir HORACE JONES, who was not a great architect, has as much space devoted to his works as serves for Sir GILBERT SCOTT. Not one building designed by the late EDWARD P'ANSON is mentioned.

The conditions of Mr. WYATT PAPWORTH'S task could hardly fail to hamper him, and will account for any shortcomings which are found in his work. He had to undertake a sort of restoration, and economy had to be considered in the adaptation to modern needs. Revision under the

circumstances becomes a sort of give-and-take problem, for the few extra pages in this new edition are insufficient to record the additions to the art and science of building. In describing new inventions the editor has sometimes to give no more than a sort of catalogue. But with all its drawbacks, the new edition contains an immense amount of information, both for students and for the everyday reference of practitioners.

#### THE MARQUIS OF BUTE ON SCOTTISH ARCHÆOLOGY.

THE opening address at the meeting of the British Archæological Association in Glasgow was delivered by the president, the Marquis of Bute, in the Merchants' Hall. In the course of his address the Marquis, alluding to the period of the union of the crowns and the transference of the seat of government, said it was an illustrative fact that they would only be brought in contact with some three or four buildings of that period, and only one of these of a State character. That one was the Chapel Royal of Stirling, built by James VI. for the baptism of his eldest son Henry, and even this was built before the union of the crowns, and its present condition, which they would see, was an interesting instance of the results of the subsequent changes. The other buildings, viz., the Argyll lodging at Stirling, now a hospital; Newark House at Port-Glasgow, now included in a timber yard; and Torwoodhead Castle, now a roofless ruin, were private dwellings, and as such were even in their best days the evidences not of public prosperity, but of individual opulence. If, however, this period had left almost no monuments in the shape of edifices, it had left plenty in the shape of destruction. Among these some of the most, perhaps the most, typical were the buildings of a public or State character. They were to visit four which had been royal residences, viz., Stirling, Rothesay, Linlithgow, and Dunfermline. They had in common that they were all more or less monuments of the brilliant epoch of the five first Jameses.

Rothesay was a third-century castle, with an addition of the time of James IV. The arms over the gate were among the earliest instances, if not indeed the first instance, of the employment of the two unicorns as the royal supporters. The present drawbridge was a most careful restoration from the existing piles found in the moat, and from parallel cases made for him by the late Mr. Burges. Rothesay Castle was burnt in Argyll's rebellion in 1685, and had been a ruin ever since. The three other palaces they would see had suffered during the later period. That of Dunfermline, a combined palace and abbey like the Escorial, he need hardly speak of, because its associations, both religious and historical, from the days of Malcolm and Margaret downwards, were so important and vast that he could not touch them in a single paragraph. The palace was last occupied by a king, by Charles II., at the beginning of August 1650. He left it on the 16th.

Another very striking instance of the results of the Union would be seen in the magnificent palace of Linlithgow, burnt by the English troops after their defeat at Falkirk on January 17, 1746, and which had remained unrestored. One more mark of the change was the present condition of the castellated palace of Stirling. They would see for themselves the state of the building—its abandoned gardens, its distimbered and neglected parks, its pleasaunce and tilting yard turned into a cemetery, a fate which was just impending for the historic hill-top which lay beneath its eastern wall. Their attention would be called to the great Dominican Church, Stirling, in which, among other events, Mary and James VI. were anointed and crowned. This church was now slowly undergoing a process of restoration, which had as yet extended only to the chancel. It was obvious that in the Middle Ages it was partially rebuilt, the chancel being the only part accomplished. With regard to the present restoration there were one or two things to be said. He trusted it would be neither accompanied nor followed by any modern outrage upon the usages of the past, such as the stone pulpit with which St. Giles, Edinburgh, had been disfigured, but that the wooden pulpit would be placed on the south side as the best position for hearing, as the Mediævalists would have done, and as was done in similar buildings in France and Belgium. There were three points upon which he hoped they would be very careful with this restoration. First, if the side chapels reached down into the nave, they ought to be incorporated with it. In the second place, if the vault of the nave was to be interfered with at all, he trusted it would only be interfered with with great caution. Thirdly, no one could doubt that there was a chancel screen. Its top was almost certainly occupied by a gallery as at Glasgow, where the town council seat was. Very likely it bore the royal throne. Its position was now occupied by a wall, as used to be the case in St. Giles, Edinburgh, where his lordship remembered the Queen's throne, and a curious wooden barbican resembling that of Rheims. He greatly feared that in the sweeping



restoration of St. Giles's, not only might the royal throne have been displaced from its ancient position, but the only remains of the Mediæval screen might have gone. He implored the authorities of Stirling to be careful how they tampered with the wall across their chancel.

It was stated that the eastern portion of the Dunfermline Abbey was cast down by the Reformers in 1560; but it was difficult to tell what that meant, as that portion did not fall till 1672, while the deliberate pulling down of the last part did not take place till 1819. On referring to the Parish Church, Rothesay, and the church of St. Blane, South Bute, as well as a prehistoric erection called the Devil Toes Cauldron, which was, perhaps, both a temple and a tomb, he spoke of Dunblane Cathedral, which had had the lead stripped off the roof for use in the siege of Stirling Castle, and which had not, as far as he was aware, been covered again. It was now to be completely restored, and as far as he was aware, the work was to be done in a carefully conservative manner. They would observe at Dunblane the very remarkable plan of the wall which separates the chancel from the nave. He imagined that it may have been masked by some immense wooden structure in the nature of a wooden loft. The remaining specimen of ecclesiastical ruin which they would see was Paisley Abbey, created in 1373 by Walter, the first High Steward of Scotland, as, he might say, an expression of the religious and cultured sentiment of the great house of Fitzillan, otherwise called Steward, to which he belonged, and the descendants of which had now occupied the throne for more than five centuries down to our present sovereign and patroness. In one respect the site, or part of the site, on which the abbey was built would present one of the most remarkable features in Scotland. The transepts, the lantern, and the chancel of the church must have been in ruin for some time, but the domestic buildings of the abbey still stood, though mostly unroofed, including the great cloister. These were, he believed, one of the only two specimens of domestic buildings of an abbey in Scotland. If anything was to be destroyed the churches could have better been dispensed with, as there were plenty of them; but even so late as a few years ago a great portion of the buildings at Paisley Abbey had gone in order to straighten the street by 18 inches or 2 feet. They had given place to a grimy plot of grass and an iron railing. While regretting the past they must, however, look to the future. The historical and, in one sense, the artistic treasure had been annihilated for ever; but the architectural and, in another sense, the artistic feature, could still be restored, and in any work of which Paisley Abbey might become the object, the first thing to do was to erect a new square of buildings, church offices, or anything else as they pleased, exactly upon the old foundations, harmonising with the church, and reproducing as far as possible the general idea of what had been lost.

#### INDIAN ARCHITECTURE.

THE following description is given by an occasional correspondent of the *Times*, in the course of a letter on a visitor's impressions of India:—

The magnificence of the architecture was a great surprise to me, though I knew well Fergusson's "Indian and Eastern Architecture," and had seen scores of Indian photographs, besides models of Indian buildings and the good casts at the South Kensington Museum. No scale appended to drawing or engraving—50 feet to the inch, 100 feet to the inch, 200 feet to the inch—really gives one an adequate impression of the size. No drawing or engraving really gives one a true sense of the material, the surface texture, the colour; yet the scale of the Mogul architecture and of the Dravidian and Chalukyan architectures is enormous; and the materials at the disposal of the builders, especially in Northern India, were firm and lovely in texture, brilliant in colour. The Mogul Palace at Delhi (mutilated now, but in parts intact) was more than 1,000 yards long, more than 500 yards wide. The Pathan Mosque at Kalburgah, with its whole area roofed in, covers more than 38,000 square feet. The regular type of a first-class Mogul tomb—such as that of Akbar at Secundra, near Agra, or of Jehangir at Shah Darrah, near Lahore—requires for its site a garden of many acres, walled in, umbrageous, many-fountained, perfectly kept up. It requires one or more magnificent semi-dome gateways, each with three or five portals, for its approach. The gateways will be similar in plan, and almost in size, to the southern gateway of the great mosque at Futtehpore Sikri, near Agra, which measures 130 feet by 85 feet in plan, and probably 150 feet in height. It requires a lofty terrace for its base, 300 feet long or longer, and 30 feet high. Above this it requires a second terrace, a third, and a fourth, each smaller but more ornate than the one beneath it, wherein to raise an enclosure of white marble trelliswork, pierced with lovely patterns. Inside this will probably be a cloister of the same material, but of greater delicacy in workmanship, enclosing the central tomb. The Taj Mehal at Agra, and the tomb of

Humayun at Old Delhi—where the King of Delhi, with thousands of retainers, retreated after the capture of New Delhi by our troops—are on the same scale, but the central edifice is different in each case.

For colour and surface texture the materials at the service of the architect in North India were splendid. The lower parts of the buildings are usually of red sandstone, so hard in texture that you might deem it red granite; and for the upper or central portion you have marble of exquisite whiteness or of opaline tints like the pearl. In the great tower at Old Delhi, the Kutub Minar, probably the finest tower in the world, where the Hindoo architect worked for the Moslem conqueror, you have sandstone, red, pink, and yellow, with grey quartzose rock and white marble. The combination of red sandstone with white marble is almost universal all through the best Indian buildings of the sixteenth and seventeenth centuries of our era, and was used in the Kutub Minar in the very beginning of the thirteenth century—more than one hundred years before Giotto began the Campanile at Florence. In the Upper Punjab red sandstone and white marble are less habitually used, but there brilliant effects of harmonious colour were obtained, as in the great mosque of Vitor Khan at Lahore, and in hundreds of nameless tombs now desecrated, by the use of Persian tiles. These tiles are most brilliant in colour, often true mosaic, each colour and each leaf let in separately on its own piece; and in the blistering sunlight of India they do not look garish.

There are whole groups of buildings built at one time, with co-ordination and immense variety, still existing though untenanted. Notable among them is the great group at Akbar's fantastic capital, Futtehpore Sikri, no sooner built than deserted, and the delightful group at Sirkej, near Ahmedabad. At Futtehpore Sikri water was not to be had, and so magnificent mosque and gateways, tombs of the saints and lovely pleasure-houses, dreams in stone and fantasies in marble, are left high and dry to the jackal and the wanderer. At Sirkej tombs of saint and king and queen and princes, mosque and exquisite pavilion, artificial lakes with palaces and stables, are barely occupied; but all show the one conception of the artist, the one hand of the founder. Where to find their equal in Europe for perfect execution of a harmonious but complicated plan, for co-ordination of many buildings to one effect, for simple paths and imaginative beauty, it would be hard to say.

For delicacy of carving and costliness of labour no buildings I ever saw approach the two white marble Jaina temples on Mount Abu, at the southern point of the Aravulli range. The older of the two is of the date of Edward the Confessor; simpler, nobler, more intellectual than its later and more lavish rival, the work "as elaborate as good taste would allow in any purely architectural object." (Fergusson, iii. p. 234.) Each of the temples is surrounded by a court with double colonnades. Each of the vaulted panels (about 100) in each colonnade differs from every other. In one you see ships, for the merchant prince, the founder, had sea-going fleets, and in other a goat-footed Pan (Gandharva) plays a reed-pipe. The temples stand on a mountain garden, 4,000 feet above the sea, an oasis on the verge of the great Indian desert. They are not much mutilated, though the Moslem held the land once, and mere barbarian Hindoos, in a native principality, have defaced with their coarse colours the white statues here and there. The Lamp of Sacrifice burns brightly in the fair twin temples, and the founders chose their site well—an Indian Sinai with a lovely plateau, environed with granite hills and forest greenery. So far I have spoken of structural architecture only; but India has several series of monolithic, rock-hewn temples of great magnificence. Some are decorated with admirable sculptures, as at Ellora, Nassick, and Karli, all within easy reach of Bombay. Some, as at Ajanta, near the battle-field of Assaye, glow with frescoes of good drawing and most harmonious colour. No other class of architecture is so durable, so unalterable, or so rich in results proportionate to the labour, for it is less labour to wheel the refuse material away than to bring material from far. But this class of work is only possible where you have rock of faultless character, smooth, firm, continuous, reliable. Doubtless there is something illogical in placing a temple under a hill, almost in a pit; though the rock may be hewn out far away from the side of the temple, and corridors are grooved out of the opposite rock to enable you to see the temple, its friezes, columns, pediments, pinnacles, roofs perfectly. Still, a monolithic temple—porticoes, columns, sanctuary, all of one unbroken piece—as large as a small French or English cathedral, fourteen or fifteen centuries old, is worth a long voyage to see. With buildings so superb in every part of India, ranging through more than twenty centuries, from the pillars of Asoka (B.C. 272 to 236) downwards, it is matter of deep regret that often they are still miserably protected. You will see at Agra and at Delhi and at Lahore that the cornelian and agate decorations, Florentine inlay really in origin as in style, have been picked out. You will see that they have been replaced quite freshly, and picked out again. Perhaps it is a Penelope's web the inlayers are playing at, in a spirit of self-



help; or perhaps Tommy Atkins in his more inquiring moments is the transgressor. You will see mosques mutilated by the so-called owners. Inquiring as to the defilement of a most lovely mosque and the gross neglect of the founder's tomb in a great city, you will learn that the highest British official is powerless in the matter; that he cannot even apply to the restoration of the tomb a donation sent him for that purpose; that the ownership rests with a guild of butchers; and that to turn a lovely mosque into a lazar-house is not repugnant to native feeling. You will find that in Buddhist and Jaina cave-temples, unearthed within the last dozen years, the faces of the saints and the exquisite forms of the women have been freshly mutilated by Mussulman iconoclasts. You will find that even the British Government is an offender, if it be an offence to brick up the face of the lovely Pearl Mosque in the fort at Lahore, in the last quarter of the nineteenth century, without any military necessity.

Mr. Henry Travis writes to the *Times* on the above:—After reading the very graphic account of architectural splendours in India—splendours mainly due to the variety of coloured materials used in their construction—it may surprise many of your subscribers to be told that there would be no difficulty in erecting buildings in the United Kingdom of equally beautiful stones. Quarries of them abound, and there are manufactories quite equal to any demand. Cornwall abounds in the richest porphyries and serpentines; Scotland in granites of various colours, and possesses a marble of a very pure white. Adopt a suitable style of architecture, and all these could be displayed here with as much effect as in India, and with no extra cost over and above that of the elaborately carved freestone buildings we are accustomed to see daily in the streets of the metropolis. The materials, indeed, are in daily use as ornamental details of buildings otherwise constructed of common stone. There is a very strong recommendation for their use apart from their beauty, viz., their absolute durability—a characteristic not possessed by freestone.

## WELLS AND THE CATHEDRAL.\*

BY PROFESSOR FREEMAN.

I AM sorry to say that though I am not quite the helpless creature which the newspapers have chosen to paint me, though I am not "laid up" or "confined to my house," still I am held not to be equal to any appearance at public meetings. I am, therefore, most unwillingly obliged to give up my purpose of doing a good deal at the present meeting of the Somerset Archaeological and Natural History Society. It was arranged that I should undertake, not for the first time in my life, the exposition of the two churches of Wells. This I cannot do; I the more regret it because of the new light which has lately been thrown on the history of the cathedral church at an important part of that history by its own sub-dean. Mr. Church's three papers on the episcopates of Reginald, Savaric, and Jocelin are specimens of the best kind of local work, and such as has never before been applied to this part of the story of the church of Wells. It is not everybody who knows how to treat a piece of local history, but the many years which the sub-dean has spent under the shadow of St. Andrew's has enabled him to do it as it should be done. I wish he had done it sooner; I might then have put some things differently in the little book which I wrote some years back from such lights as I had then. A work of that kind is not easy; the history of one of these ancient churches, the history either of its buildings or of its foundation, the mere succession of its members, is not a task to be trifled with; it cannot be dashed off by a swift-going pen at a moment's notice, like the "Etcetera" or "The Sign of the Ship" by the ready scribe of a popular magazine. It needs some control of the "forward, delusive faculty" of which Bishop Butler found something to say. It needs some practice in historic criticism, some notion of the nature of evidence, some restraint to be put on the popular belief that it is safe to say that a thing did happen, because it is not impossible that it may have happened. I do not know whether Mr. Church has written "charming papers," but he has at least written scholarly monographs. From those scholarly monographs I have learned something. I see that the dates of the buildings of the church of Wells—as I have understood them, as even Professor Willis understood them—must be thoroughly gone through again. I am not ready with a new theory; I can't make theories all of a moment. Before I give any opinion whatever, I must go through the whole evidence, and I must look it over again on the spot, which I am just now not quite in the case for doing. But I may throw out a hint or two which some one may, perhaps, look to during the meeting, which I may myself look to some other time. I speak only of things which may be, not of things which I at all say

were. All that I have ever done in the matter has been from printed sources; manuscripts are not my line. At once to dig the stones and to build the temple does not fall to the lot of every man; one may say that it falls to the lot of the Bishop of Chester only. Whatever I build I must have my stones dug for me, and, till Mr. Church took the quarry in hand, it seems that the stones had never been dug in right order. Metaphor apart, the printed sources to which I had to trust gave no true account of the manuscript records. When I wrote my little book, I asked that those records might be printed; Mr. Church's monographs supply a fresh reason for printing everything. From his report one thing is plain. In the architectural history of the church of Wells, we must not—as, on the strength of our printed authorities, we have hitherto been inclined to do—take a wide leap from Robert in the middle of the twelfth century, to Jocelin in the thirteenth. It is now plain that, beside them, Reginald, in the intermediate time, later in the twelfth century, also did great works of building. That is plain from several records of his time; but, unluckily, those records give us no hint as to the part of the church on which his labours were employed. That we must make out as we can from our notices of the other builders, and from the evidence of the building itself; and far be it from me to commit myself to any view as yet. But I may mark a few points for guidance.

First of all, as the sub-dean seems to have noticed, the conventional phrases about the church being well-nigh ruined at such and such a time are merely conventional phrases, and go for next to nothing. The old builders took a very small occasion for rebuilding or recasting if the fancy for rebuilding or recasting took them. Secondly, that we must remember that the old-English church of Primitive Romanesque, the church of Gisa and his predecessors, clearly lived on till the time of Robert—as the nave of St. John of Beverley lived on till the fourteenth century—and that part of it may have lived on longer still. When Robert is said to have built and consecrated a new church, that might very well, in the exaggerated language in which such things are set down, have really meant that he rebuilt the eastern part, according to the custom of his time, on a greater scale—as it was afterwards enlarged to a greater scale again. This work, be it noticed, would have made a fresh consecration needful. It is possible, therefore—I do not say that it is more than possible—that the present nave, by whomsoever built, immediately supplanted the Primitive nave. And it is tempting—I do not say it is more than tempting—to suggest Reginald as the man who did the supplanting. Only, to whomsoever we assign the nave, we must remember that it is evidently part of a design which took in the eastern limb and the transepts, and of which the nave would naturally be the last part built. Again, we must remember that there is one part of the building of quite different work from the nave, but which looks still more the time of Reginald. This is the north porch, clearly too late for Robert, clearly too early for Jocelin. Then again, it is perhaps not quite safe to assume that the west front is necessarily later than the nave. It is undoubtedly later in idea; but, as I said long ago, it need not, therefore, be later in age; there are marks in the building that look both ways, and when the late Mr. Parker and I examined it together, we came to the conclusion that the west front was the older, and we gave up that view only in deference to Professor Willis.

It was not at all unusual to add on a west front to an earlier nave, which earlier nave might in after times be rebuilt, or not. And it was especially usual in the age which, above all others, indulged in building west fronts which had no kind of relation to the nave, fronts which can be spoken of in plain words as "shams," though the word does seem to grate on some specially delicate ears. I can only say that, if anyone objects to call the west front of Wells a sham, it only shows that he can never really have looked at both sides of it; that is all. We have usually, when the Society meets in Wells, to raise our moan over such of the smaller antiquities of the city and its immediate neighbourhood as have perished since the time of the last meeting. We have had a longer interval than I had looked for since our last Wells meeting. We met here in 1863; we met here in 1873; I fully expected that we should have met here in 1883, but the time was put off till 1888. That is, the time of absence from Wells has been half as long again as the other time, a fact which cuts both ways. A full list of objects destroyed is likely to be longer; but it is harder to remember in 1888 than it would have been in 1883, whether a particular piece of destruction happened before or after 1873.

I am thinking chiefly of the smaller objects, specially the small domestic buildings, the good old houses which are such a special feature of the district, and of which everybody in town or country thinks himself clever if he can destroy one or two. I am pretty sure that the bishops' barn at Wookey vanished some years before the year 1873; but I am not clear when the dovecot began gradually to decay, before or after. Nor have I kept the exact dates of the various stages by which so much of the traces of the grand unfinished design of the Wells Market-place has given way to the increased

\* From a paper read in the absence of the author by Professor Boyd Dawkins, at the annual meeting of the Somerset Archaeological Society.



grandeur of a flaunting shop. How noble a feature in a street a series of Mediæval shops were nobody seems to think. But I am quite sure that it is since 1873 that an ancient house at Burcot, which I used greatly to delight in, and which I used as a model for some works of my own, was suddenly swept away, seemingly out of sheer wantonness.

Then farther from Wells is the admirable, the unique fish-house at Meare. Since our last meeting that has become a ruin. It is, I believe, strictly speaking, by nobody's fault that it has become so; but it has become so. And it surely should not stay as it was when I last saw it, last year. It was then not in the state of a ruin of ages standing, but in the same grievous state of havoc as the house which I saw in Herzegovina in 1875, which had been burned by the Turks. Now surely the Society might make some appeal to the owner. Most likely he knows nothing about it; these things are commonly left to some agent or underling of some kind, "to save or consume things as seemeth him best." Surely we could ask the owner of that unique house not to "restore" it, *quod absit!* the old house is ruined, and we don't want a sham one; but to take care of what is left and save it from utter decay. And, within the city, it was a great many years after 1873, it was some years after 1883, that one of the stateliest of the domestic buildings of the city was worse than swept away. Every one here must know that grand old house which stood not far from St. Cuthbert's Church, not enriched, but grand in its simplicity, with its three gables, its ranges of mullioned windows, showing in what kind of house a burgher of Wells once could dwell. It was a noble object to rest the eye on, as we passed from the lower church to the upper. Now, for what reason I know not, it has been cut down to the vulgarest and most paltry type of modern house; the gables have vanished, the mullioned windows have given way to rectangular holes of the poorest kind. What kind of being it can be to whom this kind of change gives any pleasure I know not, and I forbear to guess. Some here may have more certain means of knowledge. And these things happen daily.

People have begun to care for primæval and military antiquities; as for churches, they care for them rather too much; they are swept away by the subtler demon of restoration. But the small ancient houses of the land, really among the choicest of its antiquities, perish daily, and no man takes it to heart. Our great houses perish by mysterious fires: our small houses perish anyhow; one of the most characteristic classes among the relics of old times will soon be wholly lost to us. And there is another ancient building in the city about which strange and fearful rumours are going about. The bishops' barn at Wells is not quite equal to the abbots' barn at Glastonbury as an example of a class of buildings which few surpass in interest. But it ranks high in the class; it is one of the precious relics of the old days of the city and its bishopric. In no way is the skill of the Mediæval architects better shown than in their barns. To design a building for a lowlier purpose than that of a church or a palace-hall, to make it exactly suited for its own purpose and for none other, and yet to make it as truly a work of the highest art as any church or any hall—that was exactly what the Mediæval architects could do, but what I am quite sure that no modern architect could.

Set a modern architect to design a barn, and he would either stick it all over with incongruous ornament, or else give it no artistic shape whatever. But look at the old one; mark well its low and massive walls, its mighty roof with its soaring gables—a wonder of timberwork within—its solid buttresses, its narrow slits for windows—the narrow slit as much in place here as the broad window of many bays is in the church or the great hall—all solid and plain, but everything good and finished, the little enrichment that such a building allowed kept carefully for one or two fitting places—to have made such a building as this is indeed a triumph of the builder's skill. And yet I hear whispers of some designs against this precious piece of our local antiquities. I hear something said about applying it to some other use, about changing its essential features in order to suit the purposes of that other use. I read in a local paper that it was a pity that so beautiful a building should be put to so mean a use as that of a barn. Oh, the unwisdom of the ancient architect, who blindly deemed it his duty to put out his best skill for every work that he took in hand, into whose head it never came either to design a mean building for any purpose, or that any true and honest purpose could be mean, who, being called on to design a barn, designed a building that was perfect for its own use of a barn, and altogether unsuited for any other use.

It is the glory of Wells that it keeps so many buildings, from its great church and its great house downwards, which are still applied to the uses for which they were meant by their first builders; but one at least of its ancient barns still keeps its place, unaltered by any modern figures, on a list so honourable to church and city, and so nearly unique. One thing more. While we are dealing with rumours, what is this that is whispered touching something greater than the barn, touching the church of Wells itself? What is this that is whispered about a reredos? Some day or other there ought to be a fitting

reredos in the church of Wells; but we may very well do without it for the present. For any reredos made now is likely to be on peepshow principles, to show the "beautiful view" from the choir into the lady chapel. And a reredos made on peepshow principles would be a blow to the church which would perhaps never be got over. There is no greater misconception of the arrangements of a church than the notion of the "beautiful view" into the lady chapel. But I really don't wonder at it as things are. Everything in the choir is so "cabined, cribbed, confined," that one does not wonder at an escape being sought for anywhere. Only the escape is generally sought for at the wrong end. Once more, as I have said so often, as the great brass lectern teaches us, "in season, out of season," break down the middle wall of partition that is against us; let the church of Wells be as the churches of Lichfield, Hereford, Chichester, and Llandaff; then with the full length from west door to high altar forming one mighty whole, no one will be tempted to think about the pretty peepshow between choir and lady chapel. A lady chapel is built specially not to be peeped into; it is a thing of itself, a design of itself, designed to be kept quite apart from the great whole formed by the whole body of the church from the high altar westward. When the church of Wells is like the church of Lichfield, its clergy and choir in their place, its laity in their place, and the light screen between the two, then we will think of a new reredos—perhaps an old one—between presbytery and lady chapel, one the very opposite to a peepshow, one like the grand work at Winchester and St. Albans and Christ Church, Twynham. Till that can be, leave alone a thing which, if not good, is not conspicuously bad, certainly not worse than anything of the same kind is likely to be. Why Wells should linger behind the rest of the world I never could understand. Why what is found perfectly easy at Lichfield, perfectly easy at Hereford, should be thought strange and impossible here is altogether beyond me. At all events, if we cannot hasten the day of deliverance, at least let us not put it back. As yet the wide windows of the barn, the Italian alabaster of the reredos, are only in the stages of rumour. May they never come out of that stage. May they never find their way into any chronicle of actual facts, along with the destruction of the prebendal house in the North Liberty, along with the overthrow of the house of the *in-formator puerorum*, along with the breaking down of the wall between the Close and city, among the other merciless sweepings away of ancient relics and ancient memories which I can witness to during the eight-and-twenty years in which I have watched the doings of this city and its neighbourhood more narrowly than any other.

#### RESTORATION OF DUNBLANE CATHEDRAL.

THE cathedral at Dunblane, which is to be restored under the direction of Dr. Rowand Anderson, was visited on Saturday by the members of the British Archæological Association. The chancel is used as the parish church by the Rev. A. Ritchie.

Mr. Ritchie, in the course of his remarks, said that there was good authority for believing that at an early date a Culdee convent occupied the site of the cathedral. That convent was associated with the name of St. Blane, but the only fact that could be verified about him was that he was buried there. He appeared to have come from Ulster, and had been brought to Dunblane by an uncle, who had a little cell about Kilchattan Bay. It was supposed that the Culdee convent was erected into a bishopric by David I., about the middle of the twelfth century, but from that time till about a century later little was known about the building. About 1240 the building appeared to have fallen into an altogether dilapidated and ruinous state, and the revenues had become utterly exhausted. At that time Bishop Clement was appointed to the See, and it was to him that they owed the church, or at least the western portion of it. He found the place in ruins, and he left it a stately sanctuary. So far as they knew, from that time forward there were comparatively few bishops men of note. Of the more notable were Nicholas de Balmyle in the fourteenth century, who was also Chancellor of Scotland; and in the fifteenth century, Finlay Dermot, the builder of the first bridge over the Allan; William Stephen, the earliest Professor of Divinity at St. Andrews; Michal Ochiltree, who crowned James II. at Holyrood and built the church at Muthil. Passing on they came to James Chisholm, who did much in the way of finishing parts of the building, having put an extra storey on the tower, erected the parapets of the choir, and completed much of the carved woodwork. In the year 1588 the church had again fallen into a miserable and dilapidated state. Since that time the church had suffered many things. The pulpit had been unnecessarily removed from the middle of the west wall, and the tracery and the windows had been entirely renewed, with very bad effect and execrable taste, about the year 1820. Unfortunately, in



1860 the roof of the eastern part, which had never been uncovered, was erroneously thought to be in a bad state, and was sacrificed for the present erection.

The Rev. Professor Story, of Glasgow, said that one or two of the points which Mr. Ritchie emphasised were those that gave a special interest to the proposed restoration of the cathedral. The cathedral was one of the most interesting links between the earliest form of religion in Scotland and that at the present day, and it was in the light of that fact that the proposed restoration of the whole cathedral to something like what it might have been when first devised for religious purposes became so interesting. There were two ways of regarding great national monuments like this—the one of regarding them as mere old historical remnants, and the other of regarding them as links in our national history which ought to be preserved, or, if diverted from them, which ought to be restored to those uses for which they were originally designed. That, he understood, was the object of the proposed restoration, which he was certain they all felt in the hands of Dr. Anderson would be carried out with the greatest skill and with the utmost fidelity to the original intention of the builders. The building had suffered very much in past years from restorations, marked by good intention but by lamentable want of taste and of architectural skill. They had only to look at the eastern part of the church to see how much it had suffered. But fortunately it had not suffered beyond remedy, and the rest of the building was so far intact that it might be restored by Dr. Anderson to what was its original condition. In that national work he was sure they all wished him and those who were working with him the best speed, and he valued the opportunity of speaking for this, that he might express the hearty sympathy of this important and influential Association in the work which he had undertaken, a work devoted not to the interests of any one of the religious bodies into which Scotland was divided, but to the preservation of a great national monument, and which tended to impress upon our minds the great truth of the continuity of our history. The work of preserving such monuments with warm affection and care and handing them down to the future was one of the highest duties a civilised nation could undertake, and they should do well to take the opportunity of expressing their heartiest sympathy in the present project.

Dr. Rowand Anderson said the proposal to restore the cathedral had met with a great deal of opposition from various quarters. It had met with a good deal of opposition from those who thought that a building in a state of ruin should remain as a ruin, and that the great merit of a work of this kind was the fact that it was a ruin. It had also met with a good deal of opposition from a certain ecclesiastical quarter, those who thought they were the rightful successors to the possession of the building, and also from those who thought the Government ought not to make a gift to any ecclesiastical body. All those difficulties had been overcome, and in a manner, he believed, satisfactory to all parties, through the far-sightedness of the Secretary of State for Scotland, Lord Lothian, who took a warm interest in every matter of this kind. The building would be handed over to the Board of Manufacturers, a body that he dared say a great many of them knew nothing whatever about, and also a body whose name did not express their function. It came into existence at the time of the union of England and Scotland, and it was the oldest institution for the teaching of technical education in this country. It had long ceased to exercise that function, and had drifted into becoming a body having the care of works of art, and at the present moment it had the care of all the national works of art in Scotland. It was rightly judged that that body should hold the building. He was authorised to state that within the last few weeks Her Majesty had personally consented to the restoration and also to the transference of the building, which was Crown property, from the Board of Works to the Board of Manufacturers. He was also happy to state that the necessary funds had been contributed, first of all by the heritors, who had acted in the most generous spirit, and also through the munificence of a lady who had the interests of the Church of Scotland and the interests of art at her heart. The work would now be prosecuted with all possible energy, and he trusted that the result might be to show that in Scotland we were not indifferent to preserving those chapters in the history of our country which were so important to us, because they were all at one that neither a country nor an individual without a pedigree was very interesting. If ever this Association returned to Scotland he hoped they would see completed building.

Mr. W. G. Black said the revenues devoted to the keeping up of buildings of this kind in Scotland were drawn by the Woods and Forests Department, the disbursements were made by the Board of Works, and were subject very much to be curtailed or extended—seldom extended and nearly always curtailed—by the caprice of party government. Nothing, he thought, could be more disgraceful to a country than that the preservation of its monuments should be practically never cer-

tain for a single day. He urged that this divided authority should be put an end to. If the revenues were received by one body, and applied by one body, they would get clear of party interference, and the proper preservation of the most glorious relics and antiquities in Scotland would be at once secured.

A closer examination of the building was afterwards made under the guidance of Dr. Anderson. Standing in the nave, he remarked that, with the exception of two windows opposite each other at the east end of the nave, every part of the building was perfectly readable, and that there would be no difficulty whatever in dealing with it architecturally. He should only renew where it was structurally necessary to renew. For example, in the case of a moulding which happened to be decayed he was not going to cut it off, because the stability of the building did not depend upon the perfect nature of the moulding. It was only where there were structural defects that he should introduce any new work. Those were the lines upon which he would conduct the restoration. Outside, he drew attention to one of the windows he referred to. The window was divided into four compartments. They would see on the sill the remains of moulded bases; they would see also that there must have been moulded pillars rising up to the height of the capitals. There was no doubt there had been an arch over the window, and he was puzzled to know how that arch was finished. Inside the building, again, he drew attention to the double opening over the chancel arch, remarking that he had been unable to find an example of it anywhere else. Outside, again, at the west front, he drew attention to the extreme beauty of the elevation. It was not very large, but a great deal was compressed in its limits. All the features were intact, and there would be no difficulty in dealing with it. The doorway was very much worn, but he thought they should let it remain as it was. When they got the roof on decay would be arrested, and the building would be preserved for many generations to come.

#### PERMANENCY OF WATER-COLOURS.

SIR J. C. ROBINSON writes:—Among the communications I have received since the publication of my letter on the Government report on water-colours is one from a paper manufacturer, a gentleman who is, I believe, practically engaged in that industry on a large scale. It calls attention to a heretofore unconsidered danger to water-colour art, happily a perfectly remediable one, but which should be no longer overlooked.

The matter cannot be more clearly expressed than in the writer's own words. After stating that he is carefully reading the Government report, he says:—"What causes me surprise is that the mischief hidden in the material of the drawing-paper in use by artists should have escaped notice. You speak of the 'bleaching process induced by daylight,' but how greatly is this increased and intensified by the traces of the chlorine, almost universally employed in bleaching the rags in the process of making the paper, and which it is impossible by any amount of after-washing to eliminate. True, sulphide of soda is afterwards mixed with the pulp to neutralise the chlorine by converting it into a salt; but there is always danger of a sleepy or careless workman forgetting this; and who will be the wiser, or who will grieve until the delicate tints fade and the beauty perishes? Then the sulphide of soda, if not seriously injurious to the colours employed, cannot surely be without its effect on some of them. In page 27 of the report it is stated that 'a trace of this sulphate' was found in the paper, plainly indicating the presence of chlorine. Why not abjure altogether the use of chlorine, sulphide of soda, and every chemical in the manufacture of drawing-paper? True, the manufacture would be more difficult and expensive, but even with the slightly increased price that the artist would pay he could afford a penny for posterity."

The following postscript at the end of the letter ought, perhaps, to be noticed:—"The Government report states that in each square foot of the paper used there was found 'one grain of sizing matter,' but this is absurd; drawing-paper contains 10 per cent. of size."

It is satisfactory to add that my correspondent in conclusion announces that he has turned his attention to the manufacture and supply of non-chemical drawing-papers. It is highly probable that, as my correspondent suggests, the paper has been an active agent in many cases of unusually rapid and complete fading of drawings. I shall revert to this further on. In the meantime, may I be allowed to touch upon some other points with which the foregoing matter will be found to be more or less connected?

Readers of the *Times* will, perhaps, recollect the controversial storm which may be said to have raged two years ago, *à propos* of the use of one particular pigment—indigo. That this beautiful colour is in its nature fleeting and unstable the South Kensington experiments have now conclusively shown; are we then to give up the use of this colour as hopelessly un-



reliable? The same very serious question must of course be asked in regard to many other all but indispensable pigments. It is of no further use blinking these questions; rather should they be boldly faced and every instalment of suggestive information welcomed by the leaders of water-colour art practice, in the confident trust that the end will be important discoveries, which, so far from crippling and restricting the resources of the art, will, on the contrary, infinitely ameliorate and extend them.

Now, some of the most complete and striking instances of the fading of water-colour drawings are those in which indigo has played a principal part. Our early landscapists, the Varleys, Barrett, De Wint, and Copley Fielding made copious use of this pigment in skies, foregrounds, and middle-distances—in a word, in every detail of their works; and when it has faded, as it has in many instances almost completely off the paper, it has reduced these once brilliant and harmonious drawings to utter chaos. In very frequent cases in which indigo and Indian red have been mixed together to produce dark grey and purple tints, by the total disappearance of the blue colour, while the red has remained intact, the tint, once cold murky grey, has changed to a fiery salmon-coloured red. In these extreme cases it is most likely that the inherently fugitive qualities of the indigo have been greatly assisted by the bleaching chemicals remaining in the paper; for although indigo, under every ordinary condition under which it has been recently tested, has been shown to be more or less fugacious, to my knowledge it does not invariably behave in this unreliable manner. There is an instance in point before my eyes as I write, and it raises the all-important question, whether the fugacious tendency in pigments can be neutralised or entirely overcome by counteracting chemical processes, to be made use of in the preparation or after-employment of such colours.

My walls here are in part hung with ancient tapestries, and I have one specimen in particular, a fine piece of old arras, made about the year 1500. I obtained it in Spain, and it has been carefully mended, a few patches inserted, and a new margin or border, a couple of inches wide, added at the old Royal Tapestry Manufactory in Madrid. This border, I should state, is of deep indigo colour, carefully graduated to match the old blues in the tapestry, which are obviously from indigo. Now all the colours employed in this, and indeed in all the other tapestries I possess, have more or less faded, some having almost totally vanished, with one notable exception, and that is the indigo; that colour, on the other hand, has in every instance stood its ground. It is introduced in the piece I have specially referred to in extensive passages of background and masses of drapery, and, allowing for superficial discolouration, I believe that after nearly 400 years this colour shows scarcely any perceptible signs of fading. The inference is that the old Flemish dyers were acquainted with some very efficacious mordant, or other means, which rendered the extremely fleeting pigment stable and permanent. Why, then, should not this be done now? And if in the dyer's vat, why not on the artist's palette? That this permanence is not now habitually secured is curiously illustrated in the very piece of tapestry I allude to, for the patches and the new indigo border added in Madrid about twenty years ago have, on the other hand, very perceptibly faded since the hanging has been in place on my walls, and they are now visibly out of harmony with the ancient enduring tint which they once carefully matched.

Blind rule of thumb has hitherto been the only guide in water-colour art; rule of science should now be made to succeed it; I think I need not apologise for offering further instalments in that direction. Water-colourists, if they will only bestir themselves, need have no fears for the future prospects of their art. There are, I believe, no reasons why the existing difficulties and drawbacks should not be entirely overcome; and if this were so, it is my conviction that there is no medium, no method of painting so admirable, or which lends itself with such pliability, diversity, and extent of range to every form and requirement of pictorial embodiment as the modern English water-colour process.

#### VENTILATION OF GUILDHALL, YORK.

IN consequence of the success attendant upon the application of Messrs. Robert Boyle & Son's system of ventilation to the Council Chamber at the Guildhall, London, and other public buildings of a similar kind, it has been applied to the Council Chamber at the Guildhall, York, an ancient structure of considerable historical interest, the ventilation of which was very defective, though a number of air inlets and open extraction shafts were provided, but which, as is usually the case with such rough and ready contrivances, had generally to be kept closed owing to the down-draught proceeding from them, rendering the ventilation practically nil, and semi-suffocation the natural consequence.

These defects have been entirely obviated since the application of Messrs. Boyle's system, consisting, in this instance, of two of the latest improved patent self-acting air-pump ven-

tilators, 30 inches diameter, fixed upon the roof, and connected by means of 15-inch diameter pipes with two hoppers placed over perforated panels in the ceiling. This effectively provides for the extraction of the vitiated air, which is continuously drawn off, there being not the slightest down-draught, whilst an ample supply of fresh air is admitted through seven of Messrs. Boyle's improved air inlet tubes, 5 feet 9 inches by 10 inches by 4½ inches, fixed against the wall in different parts of the chamber.

A valuable feature in this system is that it is perfectly under control, a matter of no small importance in the ventilation of a public building, and that it has proved successful in this as in other instances where dependence was previously placed upon imperfect inlets and simple open pipes or flues—which, as a means of extraction, wherever tried, invariably prove a failure—is evidenced by the following extract from a report received by Messrs. Boyle, with permission to use, from Mr. E. G. Mawbey, the city surveyor of York, after a lengthened experience of the system:—

"I have pleasure in informing you that the ventilation of this Council Chamber, which I have carried out on your system, is very satisfactory, notwithstanding that the room is altogether too small for the number of persons occupying it during Council meetings."

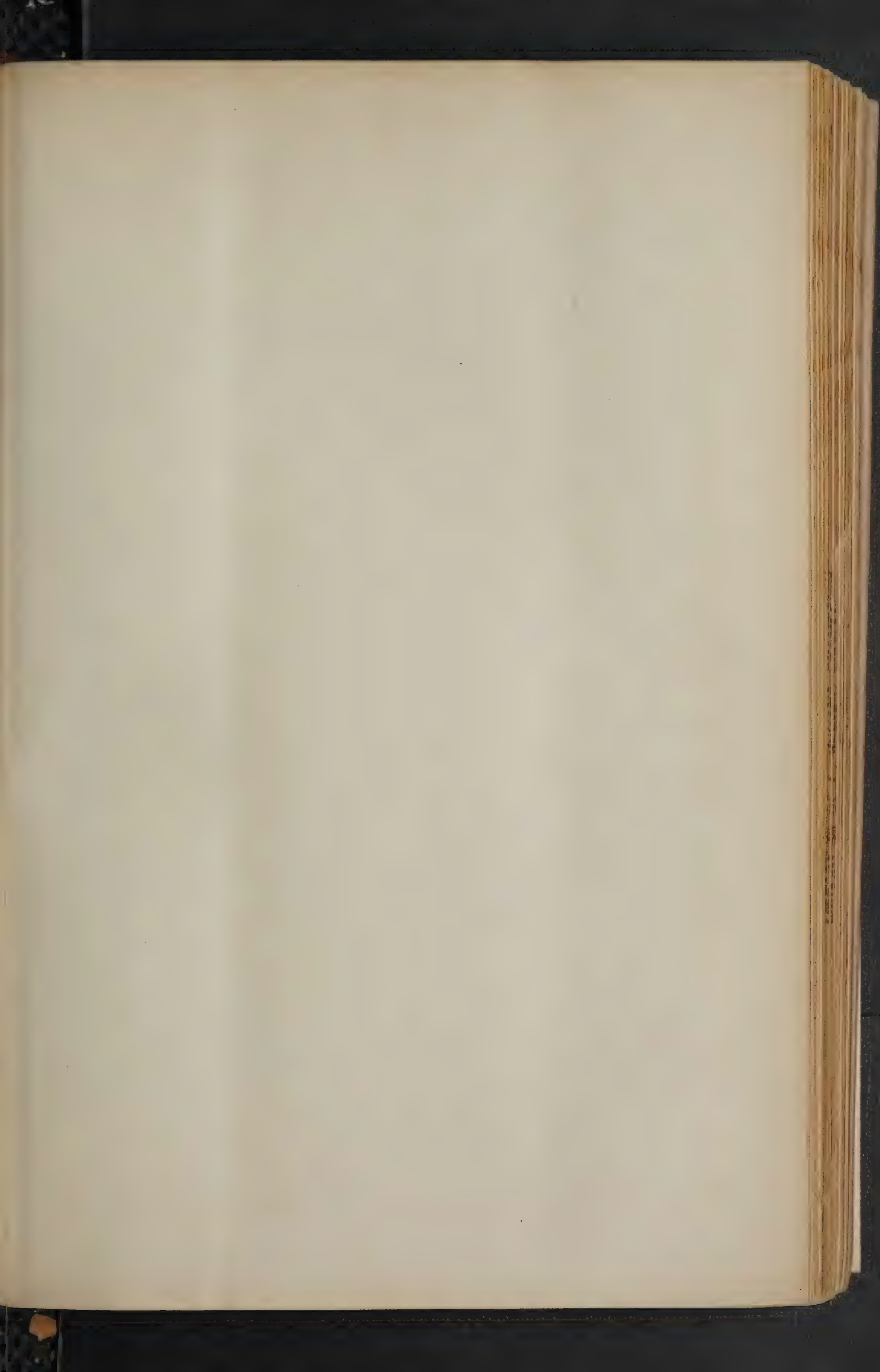
This system, which has made the name of Boyle in connection with ventilation a household word the world over, may be said to be not only one of the most efficient in existence, but also the most economical, the latest improved form of the air-pump ventilator being now supplied, we believe, at about fifty per cent. less than previous and inferior forms, besides being of a much more substantial make, it being the special aim of Messrs. Boyle to supply the most reliable ventilating appliances at the lowest price consistent with furnishing the best workmanship and material, and we think that the remarkable success which has attended their efforts in this direction fully justifies the wisdom of the course adopted.

#### SOMERSET ARCHÆOLOGICAL SOCIETY.

THIS Society held its fortieth annual gathering last week at Wells.

The inaugural address was given by the president, the Bishop of Bath and Wells, and in the course of it he said that when he was for two or three weeks in Normandy, last June, he was impressed with the wonderful beauty and grandeur of the Norman churches. He saw the same features in the castles of Falaise, St. Aignan, and Mont St. Michel, and they appear also in our own Norman cathedrals, minsters, and castles on the Welsh border. When there his attention was turned to the Norman conquest of England by being in the birthplace and in the burialplace of William the Conqueror (Falaise and Caen), and being surrounded by the familiar names of places such as Bayeux, Coutances and Avranches, which occurred so often in the history of the Conquest, it was impossible not to feel the close connection between the character of the builders and the prowess of the warriors. And that feeling was brought to its height when in the cathedral city of the martial Bishop Odo, with its magnificent Norman church, one had spread before one's wondering eyes the Bayeux tapestry, which he was almost ashamed to say interested him more than all the cathedrals put together. Prowess in architecture and prowess in war went hand in hand; the buildings which it was the province of archaeology to study and explain, were a clue to the character of the people who built them, and this was borne out by the history of the Egyptians, Assyrians, Greeks, Romans and Moors. It was an unaccountable fact that the art of drawing, which in the time of William the Conqueror had acquired the wonderful vigour displayed in the Bayeux tapestry, should have stood still and been in disuse and made no progress for nearly 500 years. That it existed they had abundant evidence in the beautifully illuminated missals and other MSS. of early times, in early painted glass in churches, in fresco drawings, such as the St. Christopher in Wedmore Church, and many others elsewhere, and in occasional portraits. There was at Westminster a very early portrait of Richard II., and this meeting ought to be reminded of the most interesting portrait discovered a year or two ago by their secretary, the Rev. James Bennett, in South Cadbury Church, and described in last year's report. The church was dedicated to St. Thomas, and so about contemporary with Bishop Reginald. Mr. Bennett while poking about his church noticed that the wall in the south-east end of the nave sounded hollow. He accordingly pulled it down, and in doing so discovered behind it the very deep splay of a small Norman or Transition window. On the side of this splay was a portrait in vivid colours of a bishop, with strongly marked features, and mitre on head. Surely it was the portrait of St. Thomas of Canterbury. He hoped that that mention of it would cause an archaeological pilgrimage to Cadbury, and that some new Chaucer would immortalise it.







The Architect, Sept 7<sup>th</sup> 1888.



Yakov Gerasimov  
1885

ARTHUR KEEN, DEL.

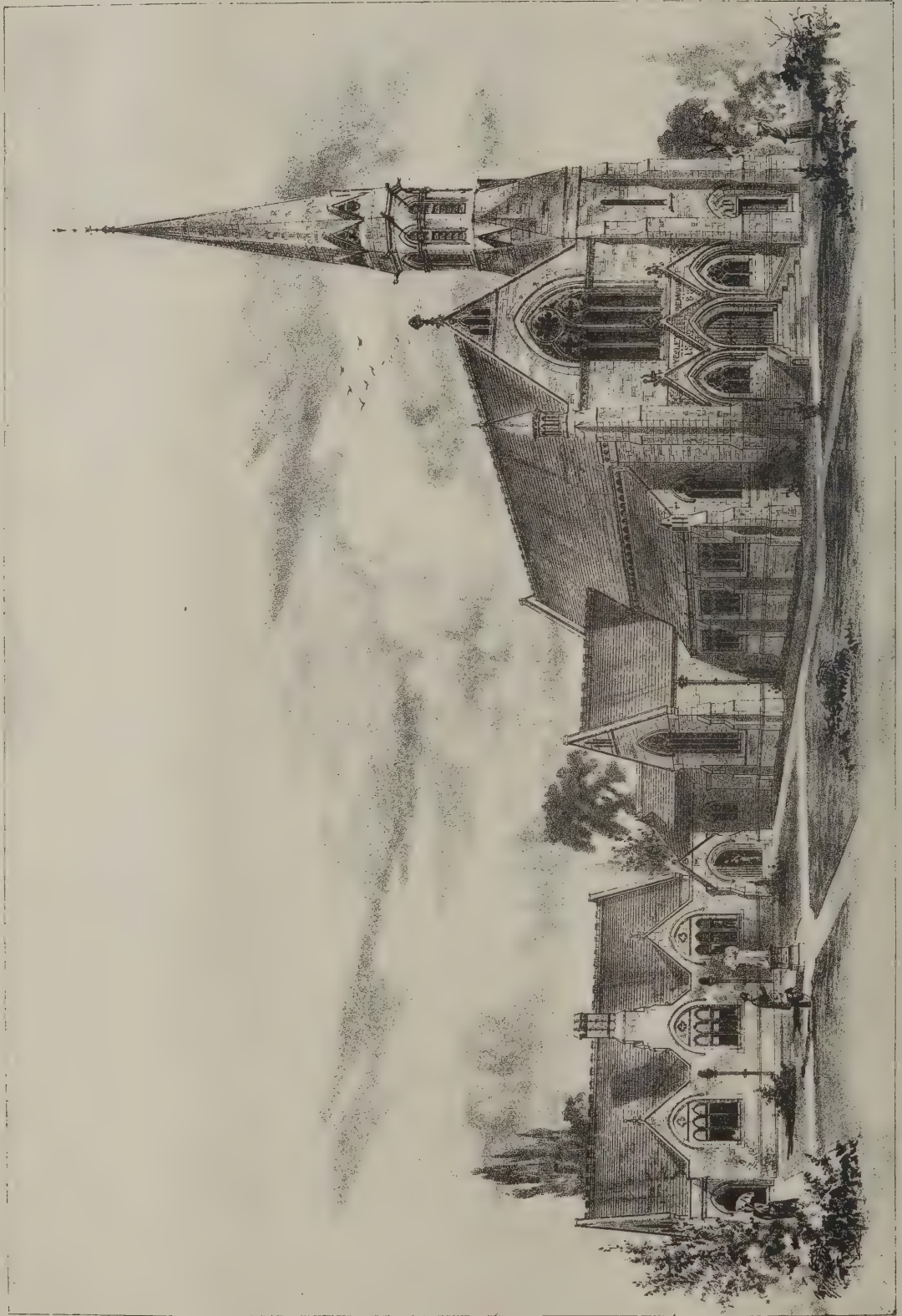
"INK PHOTO" SPRAGUE & CO. 22, MARTIN LANE, CANNON ST. LONDON E.C.







The Architect, Sept. 7<sup>th</sup> 1888.



The John Wesley Memorial Chapel, Epworth.

CHARLES BELL, F.R.I.B.A. Architect.

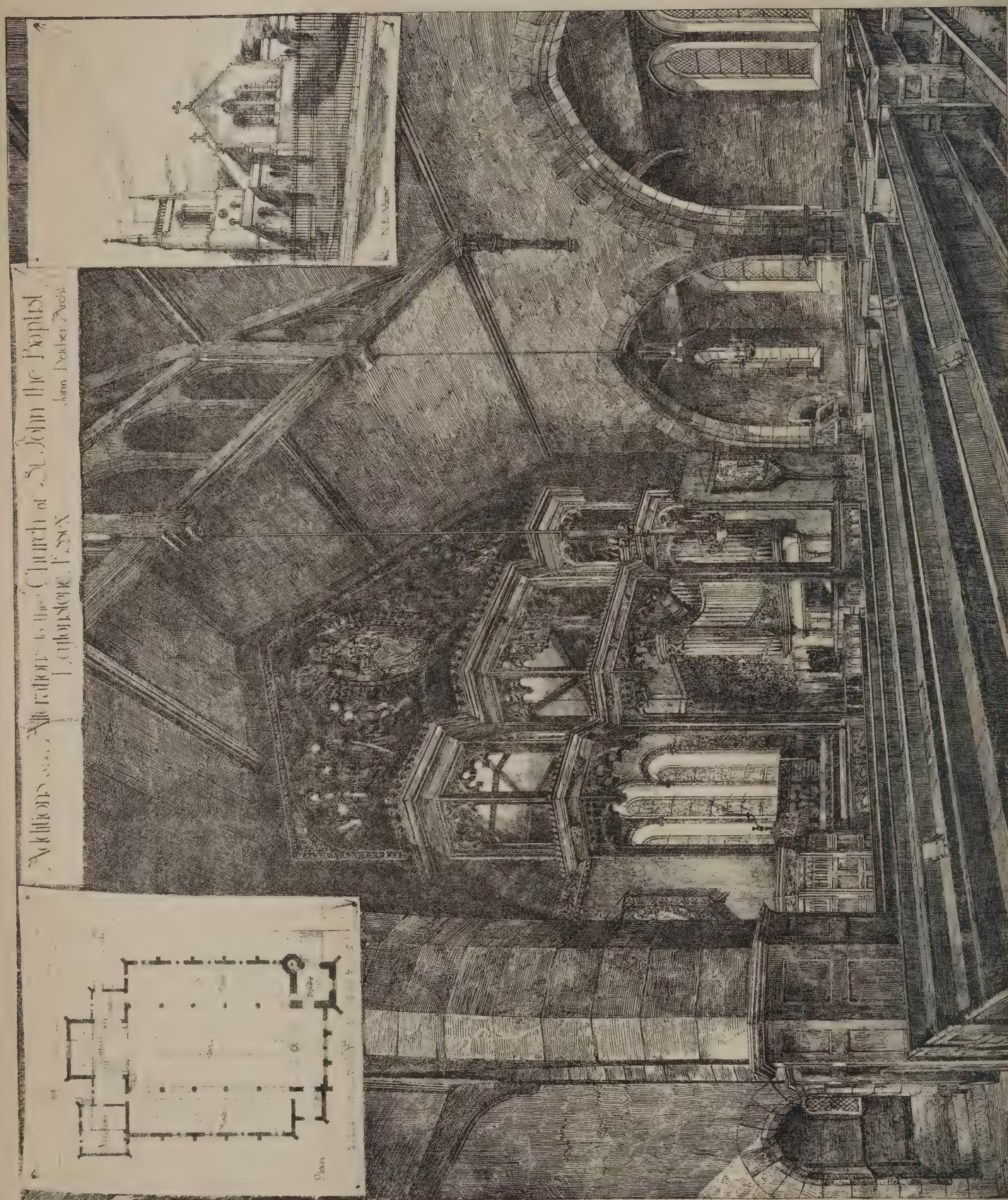
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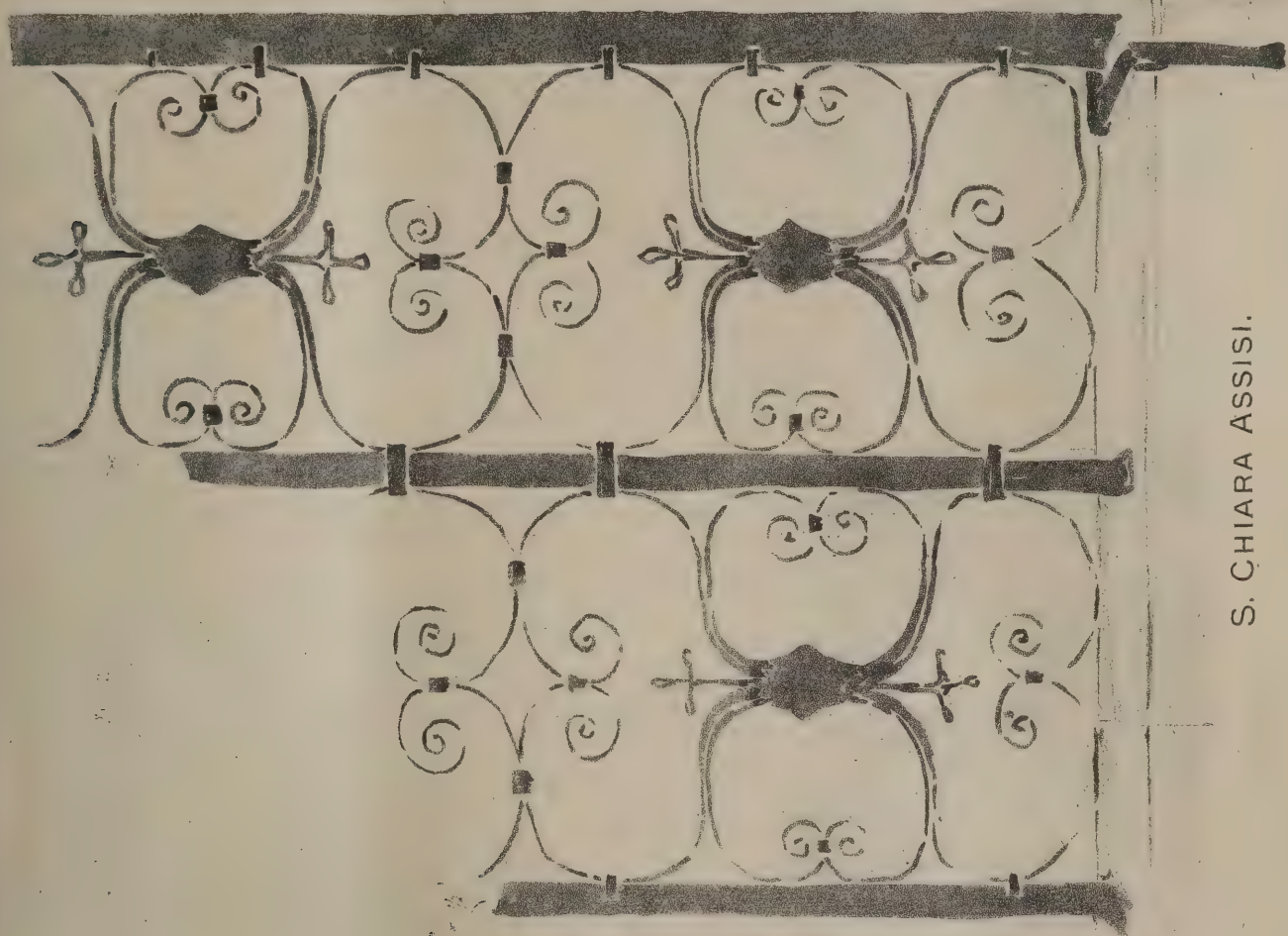




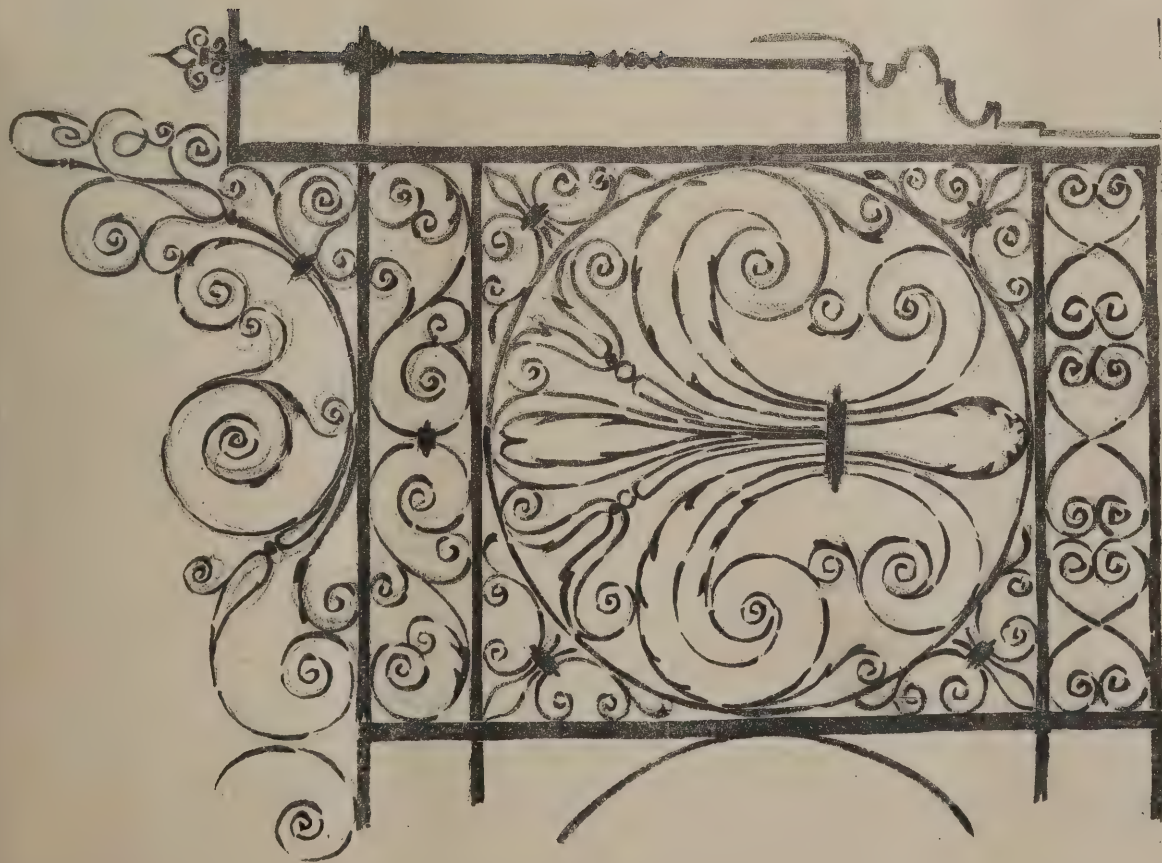
The Architect. Sept 7<sup>th</sup> 1888.







S. CHIARA ASSISI.



S. GIOVANNI IN LATERANO.

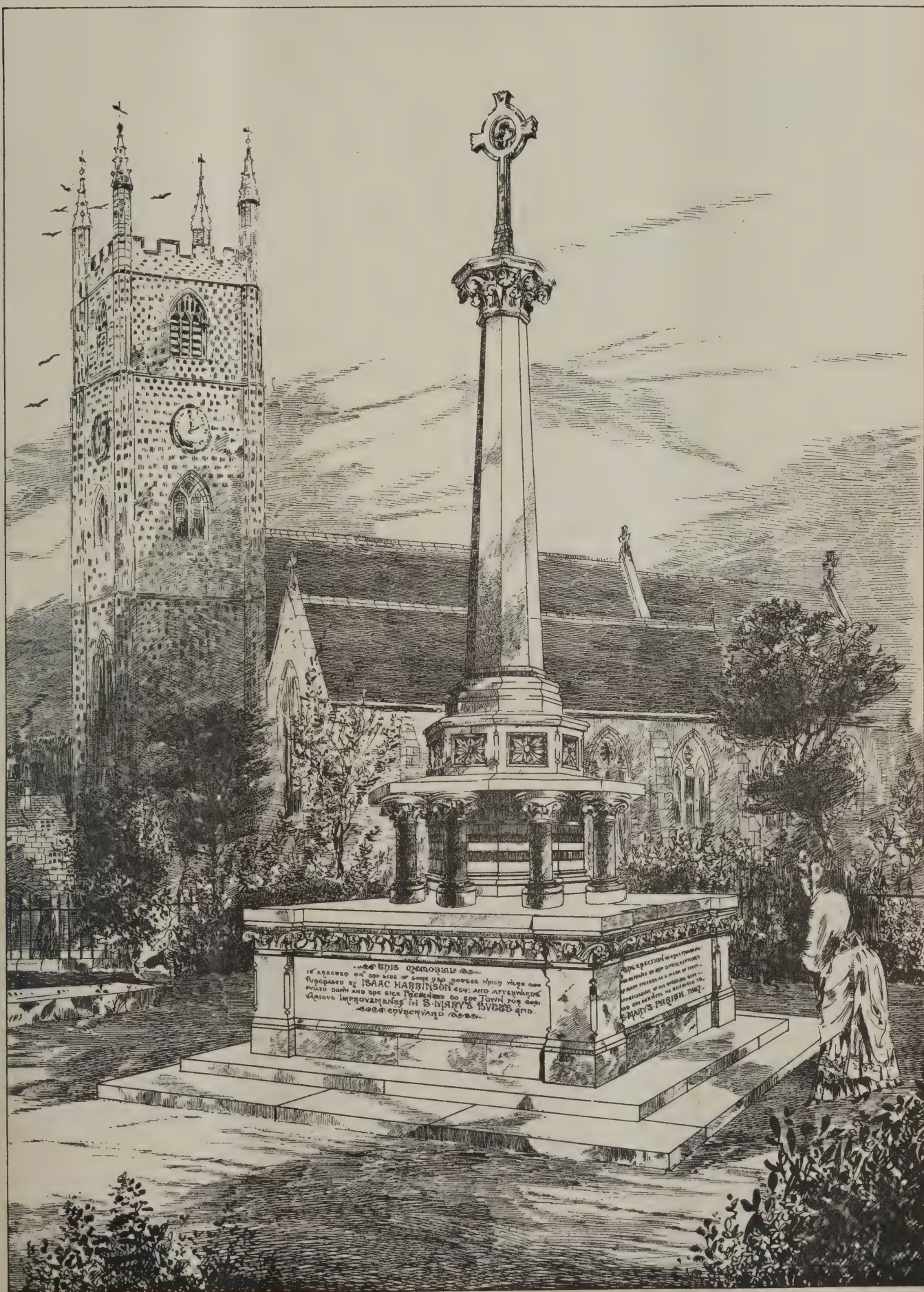
Drawn by EDWIN G. HARDY

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THE HARRISON MEMORIAL, READING.

G. W. WEBB, A.R.I.B.A. Architect









All Saints Ch. Wrington, Somerset.  
Aug. 13. 1885.

ARTHUR KEEN, DEL.

INK PHOTO, SPRAGUE & CO. 22 MARTINS LANE, CANNON ST., LONDON E.C.







## ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.NO. 16.—CHURCH, LEYTONSTONE. [JOHN BELCHER.]  
NO. 17.—ITALIAN IRONWORK. [E. G. HARDY.]

## WESLEY MEMORIAL CHAPEL, EPWORTH.

THE large village of Epworth, in the Isle of Axholme, celebrated as the birthplace of the WESLEYS, is about to have a new Wesleyan chapel and schools, as a memorial of JOHN WESLEY, whose father was rector of the parish. The old chapel is very badly situated in a back street, and no longer suitable. The new chapel will be erected in the main street, on a large and open site. The design, as illustrated, shows a chapel to seat 400, a school for 200, with three classrooms, and also two other rooms, ladies'-room, kitchen, &c. These occupy two sides of a quadrangle, and on the third side it is intended to erect a minister's house. In the centre a statue of WESLEY is proposed. The buildings are faced with Shipley stone and Ancaster dressings. The roofs are of slate. All the roofs and joiner's work are pitch pine, and the heating will be by hot water. The memorial-stones are to be laid on September 20, and it is expected the buildings will be completed in June next. The architect is Mr. CHARLES BELL, F.R.I.B.A., of 3 Salters' Hall Court, Cannon Street, London, and the builder Mr. H. KELSEY, of Epworth, whose tender was 2,740*l*.

DESIGN FOR HARRINSON MEMORIAL CROSS, ST. MARY'S  
CHURCHYARD, READING.

THIS design was submitted in a limited competition for a memorial cross to the late Dr. ISAAC HARRINSON, the author being Mr. GEO. W. WEBB, A.R.I.B.A., 14 Friar Street, Reading.

ALL SAINTS CHURCH, WRINGTON, SOMERSET.  
YATTON CHURCH, SOMERSET.

THESE illustrations are reproduced from drawings by Mr. ARTHUR KEEN.

THE BRITISH ARCHÆOLOGICAL  
ASSOCIATION.

THE members attending the Congress of this Association on Tuesday in last week visited Bothwell Castle and Church, Craignethan Castle, and the Stonebyres Fall of the Clyde, and in the evening the Marquis of Bute, the president, delivered his inaugural address in the Merchants' Hall. At Bothwell House the party was received by Mr. W. J. Easton, of Glasgow, agent to the Earl of Home. In visiting the ruins of the castle and the excavations, Mr. Easton said that last spring an old plan of the castle, indicating a tower beyond the walls, was recovered. The Earl thereupon resolved to make excavations with a view of tracing the foundations, and these had revealed a round tower, a small square one, a main gateway with two flanking towers, and the causeway leading to it.

*Bothwell Castle.*

Mr. J. Dalrymple Duncan, one of the hon. local secretaries, stated that neither the exact date of the erection nor the name of the founder of Bothwell Castle had been ascertained, but that it unquestionably dated its origin from the thirteenth century, and that the various points of similarity between it and the Château de Coucy suggested the likelihood that its architect was assisted by a knowledge of the plan and details of that great fortress. It was not even improbable that he was himself a Frenchman, brought over in consequence of the connection which about the middle of the thirteenth century must have existed between Scotland and France. The castle, in all likelihood, was built by the Olifards, who during the greater portion of the thirteenth century were lords of the Barony of Bothwell. He then traced the history of the castle and its possessors, and coming to the third Lord Douglas, who succeeded to the castle and lordship of Bothwell, said he was known to have frequently resided there, and was believed to have been the restorer of the edifice, which had doubtless fallen into very great disrepair during the contests for its custody. Probably the great hall, the chapel, and other buildings were constructed by him, for they bore the Douglas

arms in several places, and it was about the period of his possession of the barony that the Scots nobles first ceased to shut themselves up altogether in the donjons of their castles, and began to erect within the enceinte buildings with some pretensions to comfort. In 1454 Bothwell was forfeited to the Crown, but again passed back to the Douglas family, and continued in their hands till about 1655, when it was given off as a patrimonial provision to Archibald, Earl of Angus, eldest son of William, first Marquis of Douglas. He built the present modern mansion, using the old castle as a quarry from which to extract a large portion of the material required for its construction. He was succeeded by his son Archibald, second earl, on whose death, unmarried, in November 1715, of wounds received at Sheriffmuir, Bothwell devolved on the Duke of Douglas. The last-named nobleman possessed it till his death in July 1761, when there followed the well-known "Douglas cause," which was ultimately decided in favour of Archibald Stewart, who was in 1790 created a peer under the title of Baron Douglas of Douglas Castle. Bothwell now belonged to his descendant, Charles, twelfth Earl of Home. It was without question the finest example of the feudal castles of Scotland, and like its prototype Coucy, consisted of a great donjon dominating an enceinte, surrounded by high walls with towers at the corners. The donjon was 65 feet in diameter, and 90 feet in height to the top of the parapet, while the total length of the building was 325 feet by 120 feet in width. The north and east curtains had evidently been rebuilt about the end of the fourteenth or beginning of the fifteenth century.

Mr. Loftus Brock said Bothwell was one of the most ancient and interesting of the many castles of Scotland, and one that required a little study in detail in order that the gradations which Scottish baronial architecture passed through from early to modern times might be comprehended. Taking in the new excavations, the castle formed originally an irregular parallelogram, with circular towers projecting at the angles, and with a square tower here and there. These towers were remarkable from their having projected beyond the line of the curtain wall, thereby giving a good many surfaces for attack, such as they did not find in later works. Where, it was asked, did this system of defence originate? It was known that the Norman castles were designed upon a totally different plan. The Edwardian castles in Wales were something like this, and yet we could scarcely imagine that they were so early in date—in their general number at any rate. They had, he thought, the explanation in this, that the military architecture of France was very similar to what they saw at Bothwell, and that the English and the Scotch alike followed the development of French military architecture. Those of them who were at Pembroke Castle in Wales would see at once the remarkable resemblance there was between the great donjon tower of Pembroke Castle and the great tower of Bothwell Castle. The tower at Pembroke Castle was erected in the time of Edward I. The tower of Bothwell Castle, they might fairly conclude, was of earlier date, and it was quite within the bounds of possibility that it was the work of the Olifards, who owned the property at the very commencement of the thirteenth century. The building was remarkable for the careful masonry, for the close joints, and the great precision with which the stones were fitted, indicating beyond doubt that the Scotch masons of that period were extremely good workmen. From the stones which had been found in the excavations it would be noticed that each mason had marked his stone with his own particular mark. The ravages of war were but too apparent on the walls before them. An examination of the huge tower showed that in one or other of the sieges to which the castle was subjected it must have been undermined, and that the outer half of it must have fallen. At a subsequent date the then owner of the castle, whom he took to be Douglas the Grim, made the tower secure by building a wall across the fallen part, thereby converting what had been a circular apartment into a half-circular one. In the banqueting-hall was a window which many of them would take to be a geometrical window of 1260, but which in reality was very late fourteenth-century or early fifteenth-century work. There was one in St. Murren's Chapel, Paisley, of date 1420, very similar in form. Bothwell Castle being one of the oldest castles in Scotland, it was to be taken into consideration with that still older one which they would see at Rothesay. There were many points of resemblance between Bothwell and Rothesay, the chief difference between them being that at Rothesay the centre space was circular, while at Bothwell it was square or in the form of a parallelogram.

*Bothwell Church.*

At Bothwell Church Mr. Loftus Brock observed that the building was one of the collegiate churches which were founded so frequently in Scotland about the middle of the fifteenth century or somewhat earlier. The monastic foundations in Scotland passed through the same gradations as they did in England, and later the practice of founding colleges with secular priests became as universal in Scotland as in England. There was scarcely an instance of the founding of



any of the later monastic establishments, either in one country or the other, after the middle of the thirteenth century. The founder of Bothwell Church was a Douglas. In the corner of the east end near the roof they noticed the Moray stars, and on the other the Douglas heart. He took the date of the building to be the fourteenth century or early in the fifteenth. The pointed stone roof occurred again and again in Scottish castles, but here there was an unusual external covering. The outside was roofed with slabs of stone curiously overlapping one another, and which had kept out the elements all these hundreds of years since the foundation of the church. The tracery of the windows had disappeared on the south side, as also had the tracery of what had been the beautiful eastern window. It was possible this church was never completed. There were but too many instances in Scotland of a chancel having been erected, and the work carried no further. There seemed to be structural evidences that in this case the intention had been to throw out transepts left and right. At the west end they could see traces of large arches which the masons had filled in before leaving. In Bothwell Church they had as good an example of the so-called French influence as was to be found in any building he knew, due, he thought, not so much to any influence from France or abroad as to a peculiar development of the Scotch late style.

After lunching at the hotel the party took train for Tillietudlem, and thence walked to Craignethan Castle.

#### *Craignethan Castle.*

Mr. Dalrymple Duncan read a short paper upon the history of the castle. The original name, he said, of the lands of Craignethan was Draffan, and they were first heard of in 1160. They were held by Sir Hugh Crawford and Alice, his spouse, but no documents had been discovered throwing any light on their ownership for a considerable period after that date, though it was probable they formed part of the vast possessions of the house of Douglas. It was also uncertain at what period they passed into the hands of the Hamiltons, but in all likelihood James, first Lord Hamilton, obtained possession of them. Shortly after the forfeiture of the Black Douglases in 1455, he probably erected the keep of the castle, which appeared to date from the latter half of the fifteenth century. In 1529 the fortalice, under the name of *Castra de Nauthan*, with the adjacent lands, was disposed by James, second Lord Hamilton and first Earl of Arran, upon his natural son, Sir James Hamilton of Finnart, and to this remarkable man it undoubtedly owed alike much of its architectural importance and historical interest. To him were attributed the enclosing walls and towers round the keep, with the outer court-yard. In 1540 King James visited him at Craignethan, but in the following year he was accused of connivance in a plot to assassinate the king, and though it seemed not improbable that the charge was groundless, he was executed, and his estates forfeited. In 1541 the Lord Treasurer's accounts contained entries in connection with the castle, and in that year it seemed James again visited it while on a hunting expedition in Lanarkshire. The lands remained annexed to the Crown till after the king's death, when the forfeiture was recalled and they were restored to the son of Hamilton of Finnart, who subsequently became Sir James Hamilton of Evandale, and who conveyed them to James, second Earl of Arran. There was a tradition that Queen Mary was at Craignethan after her flight from Loch Leven. The palace of Hamilton at that time being merely a square tower quite unsuited for a royal residence, Craignethan Castle may have been selected for that purpose. It was undoubted that, after Langside, Moray took possession of both these places. In 1579 John and Claud Hamilton were attainted for their supposed complicity in the assassination of the Regent Moray, and had to fly. Craignethan was besieged, and in it was found James, third Earl of Arran, who had been insane for many years; but he was taken prisoner, and kept for some time in captivity. Craignethan remained in the hands of the Hamiltons till 1661, when the Duchess Anne sold it to Andrew Hay, who seems to have been a cadet of the house of Tweeddale. The house within the enclosing wall, which was built by Hay, was offered as a residence to Sir Walter Scott by the first Lord Douglas, and Lockhart told us that he was at first disposed to entertain the proposal favourably, though circumstances occurred which altered his intention. It was well known that Craignethan was the prototype of the Tillietudlem of "Old Mortality." In 1720 the estate was acquired by purchase from the Hay family by a Duke of Douglas, and in the hands of his representative, the twelfth Earl of Home, it still remained.

After inspecting the ruins, the members went down the glen to Craignethanfoot, and drove thence up the valley of the Clyde to Lanark. The five o'clock train was caught, and the party returned to Glasgow shortly after six.

An abstract of the President's address, delivered in the evening, appears on another page.

On Wednesday a visit was paid to Torwoodhead Castle and Tapock broch, a description of which will be found elsewhere.

Afterwards Stirling was visited, and the Greyfriars Church there, the Castle, and other buildings of interest inspected.

#### *Stirling.*

Mr. William B. Cook read a paper on the features of the town. He referred first to the derivation of the name, discarding the popular idea that the word was derived from the Celtic "striveling," meaning strife—whether warfare or the strife of waters—and favouring the idea that the name simply meant "the rock in the marsh." He suggested that the present spelling of the name was probably due to the assumed connection between it and the word "sterling," referring to coin as true or genuine. He described the building of the castle at various periods, pointing out that as it stood now the principal buildings were due to the Stuart kings, and gave a sketch of the history of the castle under four divisions, viz., as a royal residence, as a place of arms, as a seat of national assemblies, and as the scene of other events of historical interest. The Greyfriars Church, he said, was the scene of the coronation of Mary Queen of Scots, and also of James VI. He pointed out Mar's Work as a remarkable building, erected by the Earl of Mar in 1570, with stones taken from Cambuskenneth Abbey. Argyll's Lodge, believed to be one of the finest specimens of the old Scottish mansion-houses in existence, was built by William Alexander, first Earl of Stirling, Secretary of State to Charles II.

At the evening meeting a paper on the history of the ancient See of Glasgow was read by Archbishop Eyre.

#### *See of Glasgow.*

The Archbishop said the first mention found of the site of the old cathedral was in connection with the history of St. Ninian. About twenty years before the Romans finally left Britain, and a few years before Ninian, in the year 397, built his church at Whithorn, he appeared to have built a cell on the banks of the Molendinar. Jocelin, the monk of Furness, stated that when Kentigern came to Strathclyde he made his settlement "near a certain cemetery, which had long been blessed by St. Ninian, and was surrounded by dense and overshadowing trees." The founder of the See of Glasgow was this St. Kentigern, known also as St. Mungo. Kentigern took up his abode on the banks of the beautiful rivulet, then called Molindonor. Beneath the shade of the venerable trees a little oratory and a very humble wooden cell arose about the middle of the sixth century; and from here St. Kentigern spread Christianity throughout the whole extent of what formed later the British kingdom of Cumbria, *i.e.* the territory from Loch Lomond and Stirling on the north to Windermere and Appleby. Glasgow became the ecclesiastical capital of this extensive region. Here St. Kentigern was buried after the labours of half a century, A.D. 603. No record remained of the immediate successor of Kentigern, and there was but little information on the history of the See previous to its restoration by David I. About the year 720 the Britons of Strathclyde appeared to have obtained from Ireland a bishop named Sedulius. The convulsions of the tenth century saw the See in abeyance, and its possessions were seized by laymen. The restoration of the See of Glasgow in the early years of the twelfth century was the work of the son of St. Margaret. When the bishopric was restored by David John Adiaurs, who had been tutor and afterwards chancellor of the province, he was elected bishop and consecrated in 1115. His first care was to provide a church to be his cathedral. The ancient cemetery and its girle of trees seemed to have been nearly all that remained at Glasgow of St. Kentigern when Bishop John laid the foundation of his church. It was begun before the year 1124, and consecrated in the year 1136. Bishop John held the See for the space of thirty-two years, and was succeeded by Herbert, who held the See for seventeen years. To the episcopate of Bishop Herbert they must assign the foundation of what became the great abbey of the diocese. Walter, High Steward of Scotland, founded in 1163 at Paisley a monastery for Cluniac monks. The fourth occupant of the revived See was Jocelin, who was called to the chair of St. Kentigern from the great Cistercian monastery of Melrose. This energetic prelate obtained in 1175, as soon as he was appointed to the See, from William the Lion, the grant of a burgh, which was confirmed by Pope Lucius in 1181; and King Alexander, by a charter in 1189, granted to the bishop the right of a fair. This right was a valuable privilege from the fact of its attracting trade to the burgh. Jocelin began at once to make preparations for a new cathedral, as the structure of Bishop John had been destroyed by fire some forty years after its consecration. Jocelin died in 1199 in his monastery of Melrose. William of Malvoisin, a learned Frenchman, succeeded to the See in 1200. After the space of two years, he was translated to St. Andrews. Walter was the successor of Malvoisin, and was Bishop of Glasgow for twenty-four years. Walter was succeeded in 1233 by William de Bondington, Chancellor of the Kingdom. To him must be assigned the commencement of the present cathedral, and he completed the crypt and the choir before the year 1258. After Bondington John Cheyam suc-



ceeded to the See, which he held from 1260 to his death in 1268. Robert Wishart or Wiseheart was next appointed. He was Bishop of Glasgow for forty-four years, and died in 1316. John Lindsay was appointed to the See in 1322. His episcopate was a time of troubles, in consequence of war with England. He died on April 9, 1335, and the next possessor of the See was William Rae, who built in 1345 a bridge over the Clyde, where now the Stockwell Bridge spans the river. After Bishop Rae, Walter Wardlaw succeeded. He was created a Cardinal in 1384, and died in 1387. A canon of the cathedral—Matthew of Glendoning or Glendinning—was chosen to replace the Cardinal Bishop. During his episcopate (1389-1408) the wooden spire, for which timber was procured from Luss, was struck by lightning, and totally destroyed. With the intention of erecting a stone steeple on the tower of the cathedral, Bishop Glendoning collected some material, but was prevented from carrying out his wish by his death on May 10, 1408. William Lauder succeeded Bishop Matthew. He began the work of the stone spire. His arms and a griffin salient are cut in stone on the lower part of the steeple. After an episcopate of seventeen years, he died on June 14, 1425. John Cameron was next appointed to the See of St. Kentigern. He continued, and probably completed, the spire. Also he might be credited with the building of the chapter-house on the level of the crypt, and the vestry above it. The successor to Bishop Cameron was William Turnbull, who was translated from Dunkeld to Glasgow in 1447, and consecrated in 1448. During his episcopate he founded a university in his episcopal city. Seven months before the foundation of the university, a charter of James II., of April 20, 1450, granted in favour of Bishop Turnbull, raised the city from the rank of a burgh of barony to that of a burgh of regality. This regal barony, held of the Crown for the simple *reddendo* of a red rose, was from this date passed free from all feudal service. After an episcopate of seven years, Bishop Turnbull died in 1454, and was succeeded by Andrew Muirhead. John Laing succeeded in 1473. He was succeeded by Robert Blackader. By a bull, dated January 9, 1492, Glasgow was raised to an archbishopric, with Dunkeld, Dunblane, Galloway, and Argyll for its suffragans. James Beaton was the next Archbishop, and he was translated to St. Andrews on the death of Archbishop Forman in 1521. Gavin Dunbar, Prior of Whithorn and former tutor to James V., was next appointed to the See of Glasgow, and must be looked upon as the originator of the College of Justice, inasmuch as James instituted it by his advice, the first president being the Abbot of Cambuskenneth. Another work of Archbishop Dunbar's was the building of the gatehouse at the Bishop's Castle. Archbishop Dunbar died on April 30, 1547. The last possessor of the See of St. Kentigern was James Beaton, the second of the name. Few dioceses in Christendom had had a more glorious or edifying existence of fully one thousand years than Glasgow's ancient See. It began with Kentigern and ended with Archbishop Beaton II., who in 1560 retired to France and died at the age of eighty-six on April 25, 1603. The names of Kentigern, Jocelin, Bondington, Wishart, Cameron, Turnbull, Blackader, Dunbar, and James Beaton would always be household words in the west of Scotland. By the lovers of art and of archæology the memory must always be held in special veneration of the men who built the cathedral, a noble work of architecture, with its magnificent crypt unsurpassed and unrivalled. A little longer than Elgin, it was the second in size of all Scottish cathedrals.

#### *The Great Seals of Scotland.*

Mr. Allan Wyon, F.R.G.S., chief engraver of Her Majesty's seals, read a paper on "The Great Seals of Scotland." He said the earliest known great seal for any king of Scotland was made for Duncan II., who commenced his reign A.D. 1094. The earliest known seal in England was that of King Offa, who began to reign in 757. In both countries the seals at first had only one side, and were affixed to charters in "placard." The seals with two sides and attached pendant to documents were first made in Scotland for Alexander I. in 1107, and in England for Edward the Confessor in 1042. The seals of Scotland, although usually similar in general design to those of England, namely, with the king enthroned on one side and the king mounted on horseback on the reverse, had far greater varieties in design and size than those in use in the southern kingdom. Having pointed out the differences of the legends on the seals of England and Scotland, he described in detail the designs of the Scottish seals. He said that the seal of James I. was used for a longer period than that of any other seal in the series. It was the *Clavis Regni* for nearly ninety years, it having been first used shortly after the release of the sovereign from captivity and his return to Scotland in 1424, and continued in use until the accession of James V. in 1513, thus very nearly rivalling in this respect the use of the famous Brétigny seal which was in use in England for 111 years—from 1360 to 1471. Each of the three Jameses after the first put marks of difference upon the seal, and it had been by the observation of the use of these that the coinage of Scotland at this period had been settled.

James V.'s seal was engraved after the same design as his immediate predecessor's, but was a very poor imitation of it. With the first seal of Queen Mary began a new order of seals. The Gothic style was replaced by the Renaissance, and whilst the sovereign was represented enthroned on one side, the counter seal bore no second representation of the sovereign, but was merely an heraldic device.

#### *The Wall of Antoninus.*

Rev. Dr. J. Collingwood Bruce read a paper on "The Wall of Antoninus." Antoninus's Wall differed from that of Hadrian in being a rampart of earth, not of stone. Like Hadrian's, however, it had a deep fosse on its north side and a military way on its south. It also was provided with stationary camps for the residence of its defenders, and some minor structures, resembling the mile castles and turrets of the southern wall. It strongly resembled in its general character the great German wall which extends from the Danube to the Rhine, which was entirely an earthen fortification. Unhappily for the purposes of the antiquary, Graham's Dyke, or the Wall of Antoninus, lay in the district which was traversed by the lines of communication uniting the eastern with the western sea, and the two great metropolitan cities of Scotland—Edinburgh and Glasgow. The progress of improvement had done much to obliterate the lines of Lollius Urbicus. For fourteen centuries this *via militaris* served the necessities of the district. The same was the case on the Northumbrian wall. But rapid changes had taken place since, and it was now but the wreck of its former self. In the vicinity of Falkirk, both to the east and the west of it, the works were colossal. The ditch in Gordon's day, near Castlecary, was 50 feet in breadth and 23½ in depth. The rampart or wall, which was 22 feet distant from the fosse, was 24 feet broad and 5 feet in perpendicular height. Over most of the other places the wall had entirely disappeared, the fosse alone marking its course.

(To be continued.)

#### ANCIENT SCOTTISH ARCHITECTURE.

AT the evening meeting of the members of the British Archæological Society on Monday, Mr. Thomas Blashill presided. Among others, Mr. Ewan Christian and Professor T. Hayter Lewis were present.

Mr. E. P. Loftus Brock read a paper on "The Peculiarities of Ancient Scottish Architecture." Scottish architecture, he said, so far as was included within historical times, might be divided into three broad divisions, namely, the works of the ancient Christian days, of those in Romanesque and Pointed styles, and of those erected since the introduction of Renaissance or Italian taste. Of the first it might be briefly said that the works were similar to the contemporary ones of Ireland, from which, without doubt, their style was introduced. The ornamentation was similar to what was now found upon so large a number of crosses and slabs in Wales, Cornwall, and in many other parts of England, all in like manner derived from the art of the native church in early times. There were many small churches and oratories still remaining, and still many more which, although of later date, resembled them in many particulars. These, like the other fabrics of the early church in our isles, were square-ended and fairly well orientated, there being, however, this peculiarity which was not noticed, or not to so great a degree, in English works. It was that there were many early churches which were many degrees out of the line of orientation east and west. There were also many of which the angles, and not the fronts, were nearly free from cardinal points, in this respect resembling the great church of St. Sophia at Constantinople. Thus, among others, the following might be noted at random:—St. Giles, Edinburgh; Uddingston, Ratho, Corstorphine, Goolan, Seaton, Dunglass, Linlithgow, Dalmeny, Kirkliston, Douglas, and many others not only in the home counties but in the isles. Of all the churches of which plans were given in Muir's "Notes" only four were due east and west, or nearly so. Of all those named in the "Ancient Parochial Churches" only a single example was due east. These features of the earliest of Scottish works were of no little interest to the ecclesiologist student, for they appeared so opposite to the arrangements of the churches of Italy, where no rule of orientation had been observed at any time, either early or late, and where the churches faced in any and every direction.

As the churches of Scotland were founded, so did they continue. The past was found in the present to our own day in this respect. Thus Glasgow Cathedral, rebuilt over and over again without one stone remaining of the earlier churches, yet showed a square east end, and also in the axis of the present lengthy structure a great divergence from true orientation. It doubtless derived this from the earliest fabric erected on the site, the angles of which, and not the faces, were more truly in the direction of the cardinal points, if they might account



for the present axis by analogy from the instances of the earliest structures remaining in the country. The Mediæval works of Scotland claimed their longest attention. They were of the highest order of merit as regarded artistic design and feeling. The Romanesque style was found in perfection later than in England, but the examples which remained were richer architecturally. They had some sculpture, but the effect was produced by architectural features more entirely than across the Border. Dalmeny and Leuchars were examples. While the plan was but an enlargement of such churches as Kilpeck, what Shrobdon was, Barfreton, and many others, yet in all these the sculptured ornamentation was more apparent than in Scotland. It was in churches of this age that apses were found, but they disappeared only to occur again, as they also did in England for a short time, and in a few instances angular in form, and not semicircular, towards the end of the fifteenth century. The church of Linlithgow afforded a very good example.

The first Pointed style was found with many combinations of Romanesque features, and the stage of transition continued for a much longer period than in English or French work. The style had produced some of the most beautiful works that Scotland possessed. Arbroath and Kilwinning Abbeys, St. Andrews and Elgin Cathedrals, and Holyrood Chapel, afforded perfect specimens of purity of design and beauty of execution that had never been surpassed in any other country even in structures of larger size. These works had been said sometimes to resemble English, sometimes to resemble French churches. They did neither. They were designed in a more compact manner than in England; they were taller in proportion to their widths, the parts are smaller, they were united more to the adjoining ones, and had been studied more in relation to the parts that came next to them. While it was true that the plain flat soffits of the porches of Laon Cathedral were found also at Arbroath, yet, speaking generally, while there were certain resemblances, there were many features in French work that never appeared in Scotland, and many Scottish features not to be found in France.

One of the most remarkable features of Scottish architecture, and one in which it greatly differed from either English or French, was that there were but two Pointed styles, and not three. What was known as the Perpendicular style in England did not appear in Scotland. In its place there was a continuance of second Pointed forms, with certain variations in the design of the window tracery, at first not a little perplexing to the student. The beginning of the style had all the features of our own geometrical work, and the same stiffness in the design. Of this Glasgow Cathedral, in its choir and also in the name, afforded the largest and one of the best examples, and they could trace the progress of the design to the first incipient example of open tracery—three lancets contained within a single window, a design not only graceful, but very common. The church of St. Monance, erected about 1369, had, with far more solidity of form so far as regarded the structure, all the features of our own flowing Decorated style as regarded the patterns of the windows. The apse of Linlithgow, some few of the windows of Dunblane chancel, and the east window of Melrose had certain upright lines in the tracery not unlike our Perpendicular style, and so far, but no more, there might be a certain resemblance. Yet the College Chapel of Aberdeen, erected about 1494, had flowing decorated tracery, enclosed within a semicircular arch. Dunblane itself had flowing decorated windows beside, and of the same date as that which he had cited, and at Melrose the same thing might be observed to a far greater degree. Iona was of peculiarly early form, but its ornamentation was late. Corstorphine Church, founded in 1429, was also very early in appearance, but very late and curious in all its features. It was stone-roofed, showing an elaboration but a continuance of the form of roofing of the earliest oratories. Crichton Church was another early-looking church, with a low tower, having the peculiar Scottish feature of a parapet walk around it, and a saddle-backed roof. Its windows had flowing tracery, but it was only founded in 1449. The design of the window tracery was infinite in its forms, and all of very great beauty—in some examples similar to English patterns, in some few to French ones. He did not agree with statements made to the effect that these windows were Flamboyant in design, pure and simple. There was nothing but what any school of artists could work out for themselves, and a single man of genius would have individuality enough to introduce the use of such a feature as that to any style. Scotch work was full of such signs of personal design, and Roslin Chapel might be cited as the design of one mind following upon contemporary work. It was neither foreign nor English. Its lacework patterns here and there might find a counterpart in some Belgian work. Its heavy-pointed band vault might find a better one in many a Scottish castle, but the prentice pillar and the general conception was nothing if it was not an individual design. The same might be said of the adaptation of the beautiful and peculiar crown on the steeple of St. Giles's, Edinburgh.

After comparing further the Scottish work with the French, Mr. Brock said a few characteristics of Scottish architecture might now be regarded on account of their difference from English work. Of these, one of the most remarkable was the fact that no very ancient castles remained. There were no buildings counterparts of their own Norman castles. While the keep, not unlike that of a Norman castle, was to be found constantly, it was of much later date. It was more than probable that some of the walls of these keeps were of very early date, but the appearance was deceptive, since some such buildings even of the seventeenth century were constructed with all the massive appearance of Norman works. The earliest castles were of earth and stockading. One of the oldest works, the Castle of Rothesay, had a very ancient circular enclosing wall, having for its counterpart those of the earlier brochs, but all the architectural features were of no earlier date than the twelfth century. Another feature which claimed their notice was the absence of ancient parish churches, such as they saw in the landscape throughout the length of England. Where an ancient church remained it was mostly a large building or a portion of a large one. Small ancient oratories remained only on desolate islands or in districts far away from centres of population. Another feature was that so frequently a building of no very large size was found never to have been completed, and another was to find that a large building had been rebuilt in early times, all but its lower portions. Of this Paisley Abbey was an example. The explanation was, alas! only too readily given in the wars which desolated the fair face of the country for so extended a period. Another feature was that Scotland to-day found the great bulk of her ancient buildings in ruins, and that these ruins had become lessened to a very serious extent during the last 200 years. He had done his best to show that the ancient buildings of Scotland were the work of Scotchmen, and that they were different from any others. Their surpassing beauty and interest, their mute witness to the past events of the country as open leaves of its history, were to be seen and recognised by all.

But these ruins needed support, they needed care, they needed attention, or they would be lost to the nation. Scotland had done much in recent years, but she must bestir herself in this respect to do the work systematically, or her sons and her daughters in years to come would have lost part of what could never be replaced. A great mass of Elgin Cathedral fell but about a short hundred years ago. The capital witnessed also the fall of Holyrood, and the work had never been replaced.

Dr. Rowand Anderson said he was proud to find that Mr. Brock combated the belief that the Scottish people were almost entirely indebted to France for their architecture. That was not so. But he was not altogether inclined to go the length of Mr. Brock, and to say that this architecture was solely and exclusively the production of the Scotch. He thought that up to the War of Independence, after the death of King Alexander, the ecclesiastical architecture of Scotland and the castellated architecture in England ran in parallel lines. There were many distinctive features to be found there that were not found in England. On the other hand, he did not think that the features here were so different from what were found in England as they found between various districts in England. But undoubtedly after the War of Independence, when communication with the South was practically cut off, the Scotch developed a style of architecture which was strongly marked, and was only to be found in Scotland.

Mr. Ewan Christian remarked that the influence of the French might be distinctly seen in the architecture of Stirling Castle and church. He was very much interested in what he saw at Paisley the other day, as he did not know they had anything so fine close at hand. In some of the Paisley works there were a vigour and power which were delightful. It was to be hoped that researches would be continued in Scottish archæology.

Professor Hayter Lewis said he was much surprised on going to Stirling to find the neglected state of that most interesting castle. The old chapel was now a store-room, and there was not a particle of the old castle used as it ought to be. One could hardly speak too strongly of the absolute necessity of making representations to the Government, and he hoped they would be able to devise a memorial on the subject.

#### SCOTTISH BROCHS.

AN excursion to Stirling was made on Wednesday in last week by the members of the British Archæological Association, and in the course of the day Torwoodhead Castle and Tapock broch were visited. Mr. J. Dalrymple Duncan read a paper on the occasion. Mr. J. Dalrymple Duncan, when the party had gathered within the walls of the tower, referring to the structure remarked that among the various relics of the past which time had spared to them the Scottish brochs possessed a



special interest, both because they were a type of building absolutely peculiar to our country, and from the fact that they showed that the prehistoric architects who constructed them had possessed alike forethought and resource in working out the idea of an edifice so admirably suited to fulfil the objects for which it was intended. A broch might shortly be defined as a hollow, circular tower of dry built masonry from 40 to 70 feet in total diameter, having within the thickness of its walls a series of chambers and galleries, lighted by windows, all looking into the central area. The only aperture to the outside was a doorway through a tunnel-like, square-headed passage, with slightly-inclined sides 5 to 6 feet high and about 3 feet wide, constructed in the wall. The wall, which was from 9 to 20 feet thick, was solid for about 10 feet from the ground, except where it was pierced by the entrance, or partially hollowed out by the construction of oblong chambers with rudely-vaulted roofs. Above this the wall was carried up with a clear space of about 3 feet wide between the exterior and interior portions. Into this hollow horizontal ranges of slabs were inserted at intervals of 5 or 6 feet, thus forming galleries about 6 feet high and 3 feet wide, which ran completely round the tower. These galleries were connected by a stair which ran up to the top of the tower, and were lighted by windows in the inner wall of peculiar construction, placed vertically over each other. The central area was from 20 to 45 feet in diameter. It was difficult to say with certainty what must have been the original heights of the brochs, as the upper portions of all the specimens known had been demolished.

The best preserved was the broch of Mousa, in Shetland, which, though incomplete at the top, was 45 feet in height, so that they must have occasionally, at any rate, attained an altitude of 50 feet. The object of the builders of the brochs was undoubtedly to provide a place of temporary shelter and defence to which they could retire with their cattle and other valuables during the raids and forays of foreign marauders, which at the time of their construction were constantly occurring in the north and west of Scotland. The brochs were unmistakably Celtic in their character, and, as he had said, were peculiar to Scotland. They did not bear any proper relationship to any variety of fortified edifices known in historic times. They had been compared to the round towers, but while in outward appearance there was a certain amount of similarity, and both buildings seemed to have been intended for the same purpose, there were marked and signal points of difference. It seemed certain that there was no reason for ascribing a lower condition of civilisation to the occupants of these edifices than to the builders of the bee-hive huts and dry-built churches of early Christian times. The brochs were mostly found in the district of country lying to the north of the Caledonian Valley, and the isles around the northern and western coasts. South of the Caledonian Valley only three of those curious relics of the past were known to exist:—(1) The broch on the northern declivity of Cockburn Law, in Berwickshire; (2) one at Coldoch, on the borders of Stirlingshire; and (3) the broch of Tapock, the highest point of the Torwood, in which they then stood.

The last-named edifice was first excavated in August 1864 by Colonel Joseph Dundas, of Carronhall, who read an account of his discovery to the Society of Antiquarians of Scotland on March 18, 1865. Its appearance previous to its excavation was that of a conical hill or mound, flat on the top. On the west side of the mound there was a precipitous crag of about 100 feet in depth running north and south for about 800 yards, and on the north, east, and south sides the slope was gradual. At about 70 feet from the centre of the mound there were the remains of a wall carried round the mound until it reached the precipice on each side. Beyond this there were the remains of a second wall. Both of these walls, on the earth being removed, were found to be built of large stones roughly put together without cement. On the other side there were traces of a third wall extending along the face of the cliff, and filling up those places where the rock was not so abrupt as at the other parts. These outworks were not an isolated characteristic of the Torwood broch, as four of the Caithness and Orkney brochs were similarly protected. At the time of Colonel Dundas's excavations the mound was covered with heather and brackens, and overgrown by a clump of large fir trees. Operations were first commenced on the south side, and resulted in the discovery of the staircase, the doorway of which was completely blocked up with rubble. Work was then begun on the top of the mound, when, after the removal of an immense mass of large stones, rubble, and earth, which was thrown over on the east side to the amount of upwards of 200 tons, the structure was found to be a circular wall of 15 feet thick, enclosing an area 35 feet in diameter. At the height of 6 feet from the floor the upper part of the wall was put back 18 inches, thus forming a sort of shelf. The entrance doorway had two of the massive lintels still upon it. It was about 7 feet high and 3 feet wide at the door- cheeks, behind which were the usual bar holes. The whole length of the passage was 18 feet 6 inches. To the left of the doorway was the staircase, as usual in the thickness of the wall. There were eleven steps, and the length of the passage leading into them was about 12 feet. The height of wall re-

maining was not sufficient to show any trace of the galleries, but the presence of the stair implied their former existence. There were no chambers in the thickness of the wall on the ground floor, but all the other features of the building were of the typical broch.

#### THE LATE MR. JOHN BROWN, C.E.

THE *Birmingham Post* announces the death of Mr. John Brown, M.I.C.E., in his 65th year. Mr. Brown was one of the best-known members of the mining industry in Staffordshire, and was held in high esteem by a large number of professional and personal friends. He was originally, we believe, mining engineer at the Cannock Chase Collieries, and on retiring from that position he acquired a prominent position as confidential agent and consultant in mining operations in the district, and also had an extensive practice, extending over the Midland and northern districts, in mining arbitrations. The position which Mr. Brown held in his profession is evident from the fact that some years ago he was president of the North Staffordshire Institute of Mining Engineers, and in 1885 he was president of the South Staffordshire and East Worcestershire Institute of Mining Engineers. He was also the first Professor of Mining at Mason College, Birmingham. This appointment he held only for a short period, his professional engagements, necessitating frequent absence from Birmingham, compelling him to resign it. He was succeeded in the chair by Mr. Benton, the present professor.



#### Theatre Exits and Fire Risks.

SIR,—I have read the various letters on the above subject which have recently appeared in your columns, and I feel strongly that something more than the mere adoption of the several materials suggested is essential to secure the safety of the theatre audiences in event of a fire scare. A fire-resisting screen or curtain, constructed of "silicate cotton," is in itself an admirable thing, and the device of saturating wood, textile fabrics, &c., with "pyrodene" or "cyanite," or any of the other non-inflammable solutions, is very good in its way, but the point which has to be most seriously taken into consideration is the prevention of panic. The majority of theatre-goers presumably are ignorant of "silicate cotton" and its fire-resisting properties, neither do they know much as to how inflammable bodies might be rendered non-inflammable, and the public mind must therefore be educated by keeping the matter constantly before it.

My suggestion is this. The enterprising and far-seeing theatre-managers in Liverpool, who have lately fitted up curtains under Mr. Max Clarke's patent, should in some way make known to their nightly audiences that when the curtain is down, should there be any fire or even smoke on the stage, there is no possibility of it penetrating through to the auditorium. The curtain itself should bear on its face, in large letters, some information as to the nature of its construction, and the programmes might contain an explanatory footnote.

Sir, it is notorious that the main cause of loss of life in a theatre, when once the cry of "fire" is raised, is panic. A theatre which, otherwise, might easily be emptied in a very few minutes, has its doors and passages choked up by terrified crowds, and I contend that this would be obviated if theatre-goers were taught to know that, no matter how fiercely a fire might be raging on the stage its influence could be completely shut off from the auditorium by simply lowering the fireproof screen or curtain. To impress this fact upon the public mind, I hold it to be essential that the fireproof screen or curtain should be lowered after every act, so that the audience might acquire perfect faith not only in the efficiency of the curtain itself, but in the perfect ease with which it can be made use of, as a fireproof division, upon a sudden emergency.—Yours faithfully,

ROBERT MACPHERSON.

Gowan Lea, Willesden Green, N.W.: Sept. 5, 1888.

#### An Architectural Hint from India.

SIR,—Within the last few days a highly-cultivated traveller has been describing to us, in the leading English journal, his surprise and delight on seeing for the first time the architectural splendours of India. Although he had turned over Fergusson's pages, he remarks that no scale appended to the engravings gives an adequate impression of their immense size, still less of the charm created by the variety of coloured materials used in their construction. It would not be of much practical use to refer to this interesting communication, if it were not well within the margin of possibility to do the like, or much



the same, in this country—magnitude alone excepted. You have more than once allowed me to urge the freer use of the beautiful and durable igneous rocks in the construction of our urban buildings, and it is some satisfaction to be able now to point to a complete granite edifice in the City; but although this building is satisfactory as a first attempt, it is entirely wanting in one of the elements that should, I think, distinguish every granite structure—an element that creates no additional expense, and yet adds immensely to its beauty and artistic effect, viz. variety of colour.

Let me, then, make a few brief extracts from the letter referred to, of coloured materials used in Indian buildings, supplementing them with a list of British stones that would produce the same splendid effect, with the additional advantage which we have been struggling for nearly half a century to secure for our changeable and trying climate—an absolutely durable architecture. This done, we should probably find to our surprise that we had actually created a national architecture. There is no question of expense, because, if they are appropriately treated, these hard and everlasting materials cost no more than elaborately-carved and moulded and ever-decaying freestone.

But let us join our traveller in India, and listen to what he has to say:—"The magnificence of the architecture was a great surprise to me. . . . For colour and surface texture the materials at the service of the architect in North India were splendid. The lower parts of the buildings are usually of red sandstone, so hard in texture that you might deem it red granite; and for the upper or central portion you have marble of exquisite whiteness, or of opaline tints, like the pearl. In the great tower at Old Delhi . . . you have sandstone—red, pink, and yellow—with grey quartzose rock and white marble. The combination of red . . . with white . . . is almost universal . . . and was used at the very beginning of the thirteenth century—more than 100 years before Giotto began the Campanile at Florence. In the Upper Punjab . . . brilliant effects of harmonious colour were obtained . . . by the use of Persian tiles . . . most brilliant in colour, often true mosaic, each colour and each leaf let in separately on its own piece. . . . They do not look garish. . . . At Futtehpoore Sikri . . . at Sirkej, tombs of saint, king, queen, and princes, mosques, pavilions, and palaces are barely occupied; but all show the one conception of the artist, the one hand of the founder. Where to find their equal in Europe . . . it would be hard to say."

Now, how do we stand in this country for the production of such architecture as this? Well, there are red, grey, and white granites, yellow and white quartzose rocks, black basalt, and porphyries in the United Kingdom in abundance. The quarries are numerous; the supply equal to any demand. The hardness of the materials is of no account, as machinery surfaces and burnishes them with astonishing speed. Extra cost upon elaborate and perishable freestone may be avoided. All that is necessary is a simple and appropriate style of architecture, in which large and small splays take the place of elaborate mouldings, and geometrical mosaic of two or more colours the place of carving and sculpture.

It may be said, I think, that in a building where colour is to be the characteristic, the less moulding the better. Where colour is introduced in architectural design, it should predominate. The more the intention of the designer to depend upon colour for effect is made obvious, the more satisfactory the result will be. Such, at least, seems to be the lesson taught by these Indian buildings.—Yours truly,

H. TRAVIS.

#### GENERAL.

**The Queen** has consented to lend *The Roll Call*, by Lady Butler, for exhibition for a short time in the Fine Art Gallery, Leeds.

**A Statue** of Burns, being a replica of the one by Sir John Steell on the Thames Embankment, and costing 25,000 dollars, was unveiled at New York on Friday.

**A Proposal** has been made within the past week to present the Bishop of Durham with a portrait of himself, along with a pastoral staff.

**The Vicar of Trevor**, in making excavations at Valle Crucis, a Cistercian abbey in the Vale of Llangollen, is said to have discovered the tomb of the founder, a grandson of Owen Gwynedd, Prince of Wales. Five large stones have been laid bare, including two floriated crosses, an engraved spear, sword, and Grecian ornament.

**The Italian Exhibition** in London has many attractions. Foremost we may mention the reception-hall, which contains some noble examples of Italian sculpture, and on the right a collection of pictures lent by the King of Italy and from the Italian National Gallery, amongst which the *Charge of Bersaglieri* is most notable. The pavilion of the Roman jewellers is full of unusually effective objects, and commands and arrests attention from the many thousands of visitors.

**Mr. W. H. Smith, M.P.**, has agreed to open in October the great South Gare breakwater at the mouth of the Tees, which virtually completes the improvements which the Commissioners have been constructing at Tees mouth during the last twenty-five years.

**Mr. W. Howard Seth-Smith**, of London, has been appointed architect of the new Town Hall, Lydney, Gloucestershire.

**The Old Church** on Brentor, Tavistock, is to be shortly restored by the Duke of Bedford, who owns the Tor.

**Plans** have been prepared for considerable extensions and improvements of the general railway-station at Shrewsbury.

**A Bulgarian National Theatre** has been opened in Sofia, and the Municipal Council have voted a subsidy of 10,000 francs for the manager.

**The Spire** of the cathedral in the city of Christchurch, New Zealand, a building designed by the late Sir G. G. Scott, has been partially destroyed by an earthquake on Saturday last.

**A Site** for a new church to be built at Horwich has been given by Mrs. Wright, of Mottram Hall, Wilmslow.

**The Tunnel** through the Khojak mountain for the Candahar railway is progressing fast. It will be five miles long.

**A Sanitary Inspection** of Ayr has just been made by the town authorities, the result of the examination having proved generally satisfactory.

**The Plans** of Mr. Malcolm Stark, jun., of Glasgow, for the building of a Board school for 600 children, were on Monday approved of by the Kirkintilloch Dean of Guild Court. The estimated cost is 4,705*l*.

**The Hospital** on Crellin's Hill, built from the designs of Messrs. Bleakley & Cubbon, of Birkenhead, was opened on Tuesday by the Lieutenant-Governor of the island.

**The Anglican Cathedral**, Melbourne, is approaching completion. Owing to the value which it is expected can be realised by sale of the site, it is proposed to pull the structure down and rebuild it in a locality where more attendance is likely to be obtained.

**A Handsome Block** has been erected for the offices of the *Aberdeen Free Press*, from the designs of Messrs. Ellis & Wilson. The first issue of the paper from the new offices was made on Monday.

**A Committee** has been appointed to carry out the extension of Ardrossan new parish church, the cost of which it is thought will not exceed 600*l*.

**A New Science and Art School** is proposed to be erected at Coatbridge, N.B., under the auspices of the Old Monkland School Board, and a sketch plan, with estimate of cost, is to be obtained. The building, it is thought, can be erected for 3,000*l*.

**St. Olave's Church, York**, has been reopened after repairs, which have been carried out under the direction of Messrs. Demaine & Brierley, architects.

**A Public Meeting**, which was well attended, has been held in Dover in favour of a scheme for erecting a new promenade pier and pavilion music-hall in the bay, at a cost of about 25,000*l*.

**The Preston Town Council** have decided to call in an engineer to report on the borough surveyor's scheme for disposing of the sewage of the town.

**Mrs. C. Turner** has purchased a site in Everton on which she intends to erect a church to the memory of the late Mr. Charles Groves.

**The Vicar** of St. Paul's, Preston, proposes to build another church to provide accommodation for the rapidly-increasing population of the district.

**The Duke of Sutherland** has offered a central site to the town of Longton for the erection of the proposed municipal buildings, in addition to the land he has given for a public park and the site for a cottage hospital.

**The Theatre Royal, Shrewsbury**, has been redecorated from the designs of Mr. Randal, architect, of that town.

**A Donation** of 3,000*l*. towards the completion of the new church of St. Hilda, the West Cliff, Whitby, according to the original design, has been made by the family of the late Rev. John Turner, formerly curate of Whitby.

**The Directors** of the Buxton Gardens Company have approved of the plans of Mr. W. R. Bryden, architect, Buxton, for the erection of a building connected with the existing pavilion for theatrical entertainments. The estimate is 3,000*l*., and building operations will be commenced next month.

**Upexe Church, Devon**, has been reopened after restoration under the direction of Mr. R. Medley Fulford. The building dates from about the year 1329, and, like a similar building in the adjoining parish of Thorverton, known as "No Man's Chapel," has been for several generations occupied as a dwelling for cottagers.

CRIMINAL PROCEEDINGS, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, SEPTEMBER 7, 1888.

## CONTRACTS OPEN.

BATH.—Sept. 12.—For Building Enclosure to Roman Rectangular Bath and other Works, Strong Room at Guildhall, and Alterations at Municipal Offices. Mr. Charles E. Davis, F.S.A., Architect, 55 Great Pulteney Street, Bath.

BELFAST.—Sept. 24.—For Building Tower and Spire to Catholic Church, Holyrood. Mr. M. H. Thomson, Architect, 65 Upper Arthur Street, Belfast.

BELTON.—Sept. 7.—For Building Cottage. Mr. C. G. Baker, Architect, Town Hall Chambers, Great Yarmouth.

BIDEFORD.—Sept. 21.—For Widening Quay. Mr. Henry Chowins, Borough Surveyor, Bideford.

BIRKENHEAD.—Sept. 8.—For Building Fire Reel Shed. Mr. T. C. Thorburn, Borough Surveyor, Town Hall.

BRIDGEND.—Sept. 7.—For Building Church, Kenfig Hill. Messrs. Halliday & Anderson, Architects, 16 High Street, Cardiff.

BRISTOL.—Sept. 15.—For Additions to Premises, Wine Street, for Messrs. Belfield & Sons, also for Mr. W. B. Biggs. Mr. Henry Williams, Architect, 28 Clare Street, Bristol.

BRISTOL.—Sept. 10.—For Painting and Repairs for the Baths and Wash-houses Committee. Mr. J. Thomas, City Surveyor, 51 Prince Street, Bristol.

CARDIFF.—Sept. 14.—For Building Sunday School and Cottage. Mr. E. M. B. Vaughan, Architect, 20 St. Mary Street Cardiff.

CHESLYN HAY.—Sept. 15.—For Building New Schools. Mr. W. Wood, Architect, Longton.

CONSETT.—Sept. 8.—For Additions, &c., to British Schools and Formation of Road. The Secretary, Consett Iron Company, Limited, Blackhill, County Durham.

DENT.—Sept. 15.—For Restoring Church. Mr. W. Wright, Surveyor, Lancaster.

DUBLIN.—Sept. 25.—For Construction of Four Iron Street Bridges. Mr. E. Maunsell, Secretary, Westland Row Terminus, Dublin.

EPSOM.—Sept. 12.—For Building Porter's Lodge, Tramp Wards, Day-room, Dormitories, and Dining Hall, at the Workhouse. Mr. H. D. Appleton, Architect, 157 Wool Exchange, Coleman Street, E.C.

EXNING.—Sept. 17.—For Building Cottage Hospital, Boundary Walls, &c. Mr. Thomas Ennion, Deva Chambers, Newmarket.

GLOUCESTER.—Sept. 10.—For Building Crypt and Grammar School. Messrs. Medland & Son, Architects, 15 Clarence Street, Gloucester.

GOOLE.—Sept. 8.—For Building Peat Works. Mr. H. B. Thorp, Architect, Goole.

GRAVESEND.—Sept. 10.—For Alterations, Shop Fittings, and other Works at Nos. 3, 5, and 7 Harmer Street, for Co-operative Society. Mr. A. G. Smith, Architect, 1 Darnley Street, Gravesend.

GREAT YARMOUTH.—Sept. 19.—For Additions to Board School. Messrs. Bottle & Olley, Architects, Regent Street, Great Yarmouth.

GREAT YARMOUTH.—Sept. 10.—For Building Warehouse for Mr. F. Marsh. Messrs. Hewitt & Banham, Architects, 10 Regent Street, Great Yarmouth.

HALIFAX.—Sept. 7.—For Fronts to Shops. Messrs. G. Buckley & Son, Architects, Waterhouse Street, Halifax.

LANCASHIRE AND YORKSHIRE RAILWAY.—Sept. 12.—For Building Goods Warehouses at Atherton and Swinton. Plans, &c., at the Engineer's Offices, Hunt's Bank, Manchester.

LANCASTER.—Sept. 11.\*—For Building Workshops, &c., at County Lunatic Asylum. Mr. E. H. Dawson, Architect, 57 Market Street, Lancaster.

LEEDS.—Sept. 10.—For Additions to Cloth Warehouse. Mr. T. A. Buttery, Architect, Queen Street, Morley.

LEIGH.—Sept. 12.—For Additions to Liberal Club. Mr. T. W. Travers, Architect, King Street, Leigh.

LITTLEPORT.—Sept. 7.—For Rebuilding Brandon Creek Bridge. Mr. T. H. B. Hestop, Norwich.

LONDON.—Sept. 18.—For Bakehouse and Stable, for the Battersea and Wandsworth Co-operative Society. Mr. T. E. Webb, Secretary, 2 Plough Road, S.W.

LONGTON, STAFFS.—Sept. 15.—For Building two Houses near Clayton Street. Mr. W. Wood, Architect, Longton.

LOWER FITTLEWORTH.—Sept. 14.—For Building House. Mr. William Buck, Architect, Horsham.

MEXBOROUGH.—Sept. 7.—For Building Sunday School. Mr. T. A. Bulling, Architect, Morley.

RHEWL, MOSTYN.—Sept. 14.—For carrying out Works for Water Supply. Mr. J. L. Williams, Sanitary Inspector, Brynford, Holywell.

SALCOMBE.—Sept. 22.—For Building Chancel and Porches to Church. Mr. J. May, Courtenay Street, Salcombe.

SHEFFIELD.—For Building the Manor School. Messrs. Wightman & Wightman, Architects, High Court Chambers, High Street, Sheffield.

SOUTHAMPTON.—Sept. 10.—For Alterations to Bargate Police Station. Mr. W. B. G. Bennett, Borough Surveyor, Southampton.

SOUTH SHIELDS.—Sept. 12.—For Building Post Office. The Postmaster, South Shields, or the Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

STONY STRATFORD.—Sept. 12.—For Engine-house, Gas Engines, and Pumps, Water Tower, Mains, &c., for the Water Supply. Mr. A. F. Phillips, C.E., 31 Great George Street, Westminster.

SUNDERLAND.—Sept. 13.—For Building Presbyterian Church. Mr. G. D. Urwin, Surveyor, Baltic Chambers, Sunderland.

WEYMOUTH.—Sept. 19.—For Harbour Improvement Works, Quay Wall, Landing Jetties, Retaining Wall, Sea Wall, Diversion of Esplanade, Toll-house, Entrance Gates, Shelters, &c. Mr. W. Barlow Morgan, Borough Surveyor, New Street, Melcombe Regis.

## TENDERS.

### AYLESBURY.

For Building Post Office, New Road, Aylesbury.

T. Feasey . . . . .	£4,688	0	0
E. Jarvis . . . . .	3,800	0	0
G. Orchard & Son . . . . .	3,749	0	0
J. Dorey . . . . .	3,646	0	0
S. Grist . . . . .	3,638	0	0
Lapthorn & Goad . . . . .	3,590	0	0
J. Parnell & Son . . . . .	3,562	0	0
Webster & Cannon . . . . .	3,518	0	0
G. Dobson . . . . .	3,494	0	0
C. H. Hunt . . . . .	3,425	0	0
H. Willcock . . . . .	3,325	0	0
J. H. Kinglerlee . . . . .	3,290	0	0
Hughes & Sterling . . . . .	3,270	0	0
G. Green, jun. . . . .	3,163	0	0
T. MARTIN (accepted) . . . . .	3,041	0	0

\* Names and addresses to be forwarded not later than date.



## BANGOR.

For Supplying Earthenware Pipes (1,500 yards 15 inches) with Bends, Junctions, &c., for the Water and Gas Committee, Bangor. Mr. JOHN GILL, Borough Surveyor.

W. O. Daniels, Bangor	£507	0	0
J. C. Edwards, Ruabon	447	0	4
J. Place & Sons, Darwen	440	14	0
J. H. Pears, Bangor	406	17	8
W. Hill & Sons, Manchester	363	17	6
ROUGHDALE BRICK & COAL CO., St. Helens			
(accepted)	339	9	6
H. Wyndham, Ruabon*	245	5	5
New British Iron Co., Ruabon*	243	17	6

\* Not complete.

## Cast-Iron Socket and Spigot Pipes, &amp;c.

J. H. Pears, Bangor	£509	18	5
R. Landlaw & Son, Glasgow	499	12	0
Macfarlane, Strong & Co., Glasgow	495	14	6
Staveley Coal and Iron Co., Chesterfield	483	0	2
T. Spittle, Limited, Newport, Mon.	481	14	10
F. Silvester & Co., Newcastle, Staff.	458	13	0
T. Allen & Sons, Glasgow	454	2	5
Clay Cross Co., Chesterfield	452	1	4
R. Maclaren & Co., Glasgow	439	1	0
Newton, Chambers & Co., Thorncliffe	433	9	2
Cochrane & Co., Dudley	429	9	4
J. & S. Roberts, West Bromwich	422	13	9
C. E. FIRMSTONE & BROS., Stourbridge (accepted)	347	0	0
Surveyor's estimate	434	15	0

## BEVERLEY.

For Erection of Farm Buildings (joiner work excepted) on the Bishop Burton Estate, Beverley, for Mr. Fisher. Mr. P. HOLMES, Architect.

G. Downs	£636	0	0
PAPE BROS. (accepted)	627	10	0

## BIRMINGHAM.

For Providing and Fixing Hot Water Heating Apparatus for Residence, for Mr. W. G. Scott, Augustus Road, Edgbaston. Mr. J. A. CHATWIN, F.R.I.B.A., Architect, Temple Street, Birmingham.

HENRY HOPE, Birmingham (accepted)	£102	0	0
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(Brickwork and ornamental coil cases extra.)

## CAISTER.

For Building Classroom to Board Schools, Caister. Messrs. HEWITT & BANHAM, Architects, Great Yarmouth.

Grimble & Watts, Yarmouth	£235	0	0
Harwood, Yarmouth	221	10	0
Bray, Yarmouth	218	0	0
Chase, Caister	195	0	0
Kemp, Gorleston	189	16	0
J. BALLS, Caister (accepted)	166	10	0
Hawes, Yarmouth	155	9	6

## CRAVEN ARMS.

For Building Dwelling-house, Craven Arms, Salop. Mr. W. T. MATHEWS, Architect, Shrewsbury.

J. Williams, Knighton	£615	0	0
Weale & Co., Ludlow	515	0	0
C. T. Smith, Broseley	479	0	0
H. Barker, Onibury	433	8	0

## DRIGHLINGTON.

For Additions to Farmhouse, Drighlington. Mr. ARTHUR A. STOTT, Architect, Heckmondwike.

## Accepted Tenders.

Grayshon & Ward, Adwalton, mason and slater.  
C. Ward, Drighlington, carpenter, plumber, and painter.  
B. & J. Leadbeater, Birstall, plasterer.

Total £118.

## DUNSTABLE.

For Finishing Two Villas, Station Road, Dunstable. Mr. ROBERT DENT, Architect, Luton, Beds.

James Ayre, Leighton Buzzard, builder	£359	10	0
E. Farmer, Dunstable, builder	331	10	0
J. Robinson, Dunstable, builder	294	10	0
W. Higgs, Dunstable, builder	280	0	0
J. Cheshire, Dunstable, carpenter	260	0	0
W. Wood, Dunstable, builder	247	10	0
T. Tompkins, Dunstable, builder	236	0	0
GOODE BROS., Dunstable, plumber and house decorator (accepted)	210	0	0

## DURHAM.

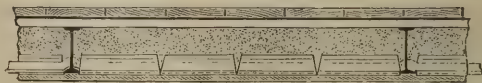
For Repairs to Tower of St. Nicholas's Church, Durham.

Gradon & Son, Durham	£275	0	0
J. Lowes & Son, Durham	175	0	0
T. COATES, Durham (accepted)	119	0	0

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**HORSHAM.**

For Erection of Residence, Manningsheath, Horsham, for Miss A. Bigg. Messrs. E. & C. H. BURSTOW, Architects, Horsham and Horley.  
Dewdney Bros., Horsham . . . . . £2,459 0 0  
P. Peters, Horsham . . . . . 1,925 0 0  
G. Sharp, Horsham . . . . . 1,903 0 0  
ROWLAND BROS., Horsham (*accepted*) . . . . . 1,898 0 0

**HUDDERSFIELD.**

For Building Cottage House, Fartown Green Road, Huddersfield.  
*Accepted Tenders.*  
J. Grenhoe, Huddersfield, mason . . . . . £132 0 0  
T. Rayner, Brighouse, joiner . . . . . 35 10 0  
J. W. Blackburn, Huddersfield, plumber . . . . . 10 2 6

**KENILWORTH.**

For Providing and Fixing Hot Water Heating Apparatus at St. John's Church, Kenilworth, for Mr. George Beard.  
HENRY HOPE, Birmingham (*accepted*) . . . . . £198 0 0

**LEEDS.**

For Enlarging St. Luke's Church Schools, Beeston Hill. Mr. C. H. THORNTON, Architect, 3 Park Row, Leeds.  
*Accepted Tenders.*  
J. Pullan, Beeston Hill, bricklayer and mason.  
Briggs & Bulmer, Beeston Hill, joiner.  
W. Atkinson, Beeston Hill, slater.  
W. H. Cundale, Holbeck, plasterer.  
J. Watson, Leeds, plumber.

**LODDON.**

For Erection of School Buildings, Loddon, for the Yelverton and Alington School Board. Mr. J. B. PEARCE, Architect, Norwich.  
Wiltkins, Norwich . . . . . £691 0 0  
Chaston & Grimson, Loddon . . . . . 674 15 0  
Hall, Norwich . . . . . 649 0 0  
Scarles, Norwich . . . . . 642 0 0  
Smith, Norwich . . . . . 587 0 0  
Riches, Postwich . . . . . 537 0 0  
Hawes, Norwich . . . . . 517 0 0  
Withens, Blofield . . . . . 450 0 0

**LONDON.**

For Alterations and Additions to 107 and 108 Cheyne Walk, Chelsea.  
H. H. Hollingsworth, Peckham . . . . . £1,280 0 0  
J. Poulton, Euston Road . . . . . 1,160 0 0  
F. J. Wicks, Willesden Park . . . . . 1,125 0 0  
Newton & Co., Clapham . . . . . 1,087 0 0  
W. J. Richardson, Lavender Hill . . . . . 1,040 0 0  
A. Brickell, West Kensington . . . . . 993 0 0  
R. & H. Bryon, Fulham . . . . . 950 0 0  
A. Cole, Kilburn . . . . . 870 0 0  
A. R. Flew & Co., West Kensington . . . . . 820 0 0  
R. Cox, Battersea . . . . . 795 0 0  
F. Blandford, Highbury . . . . . 595 0 0  
  
For Papering, Painting, and Decorating the Interior, and Painting and generally Repairing the Exterior of Annfield, No. 48 Wells Street, Hackney, for the Rev. Peter Thompson.  
GODFREY, GILES & CO., Old Cavendish Street (*accepted*) . . . . . £75 0 0  
  
For Ceiling Decorations at Oakdene, Church End, Finchley, for Mr. J. Westwood Thompson. Mr. PERCY STONE, F.R.I.B.A., Architect.  
GODFREY, GILES & CO., Old Cavendish Street (*accepted*) . . . . . £35 0 0  
  
For Distempering and Decorating the Church Room, for the Committee of St. John's Church, S.E.  
GODFREY, GILES & CO., Old Cavendish Street (*accepted*) . . . . . £45 0 6  
  
For Painting and Decorating Work in Dining-room at 80 Cornwall Gardens, S.W., for Mr. Frederick Haworth.  
GODFREY, GILES & CO., Old Cavendish Street (*accepted*) . . . . . £121 0 0  
  
For Painting, Decorating, and Distempering Work at No. 38 Charlwood Road, Putney, for Mr. W. H. Mayers.  
GODFREY, GILES & CO., Old Cavendish Street (*accepted*) . . . . . £39 10 0  
  
For Repairs to Bakery, for the Poplar Board of Guardians.  
Webb . . . . . £47 10 0  
Limm . . . . . 38 0 0  
Neal . . . . . 36 0 0  
Surveyor's estimate . . . . . 49 0 0

**BEST GREEN ROOFING SLATES.**



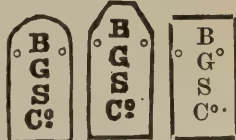
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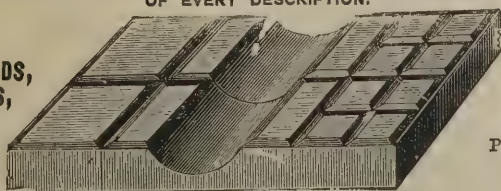
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## LONDON—continued.

For Building New Roof and sundry Alterations at Dorset Works, East Road, City Road, for Messrs. Dottridge Bros. Mr. A. G. COLLINS, Architect, 30 Finsbury Pavement, E.C.  
T. Nixon . . . . . £337 0 0  
H. J. WILLIAMS, Bermondsey Street (accepted) . . . . . 317 10 0

## PETERBOROUGH.

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Rowe, Peterborough . . . . . 54 10 0  
Turner, Peterborough . . . . . 49 0 0  
Sharpe & Ireson, Peterborough . . . . . 48 18 0  
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Architect's estimate . . . . . 49 2 0

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**TRADE NOTES.**

SOME time since a large clock was erected in Adderbury Church, Oxfordshire, by Messrs. John Smith & Sons, Midland Clock Works, Derby, and now the same firm have fixed a large carillon in connection with the clock, which plays seven tunes on eight bells (one tune for each day of the week) at three, six, nine, and twelve o'clock. The largest bell is 25 cwt.

MR. E. H. SHORLAND, of Manchester and London, has recently supplied his inlet ventilators to the Isle of Wight Infirmary, Ryde.

A HANDSOME two-light stained-glass window has just been erected in the parish church of Hanging Heaton, near Dewsbury. The principal subject which runs through both lights represents Mary at the feet of Christ. In addition to this the left-hand light has two groups, "The Descent from the Cross" and "The Last Supper," and the right-hand, "Mary at the Sepulchre" and "The Agony in the Garden." The work has been efficiently executed by Messrs. Jones & Willis, of Birmingham and London.

THE Anglo-Danish Exhibition gold medal for grates has been awarded to Mr. J. B. Petter, of Yeovil, for his Nautilus grate and mail-clad stove.

THE annual trip of the Halifax Builders' Association (president, Mr. Richard Oates) took place on the 29th ult., to Liverpool. The Manchester Ship Canal was visited and the works inspected.

THE improvements designed by Messrs. Bradshaw & Gass, architects, Bolton, for the Bridgeman Street Baths and Assembly Rooms in that town, are now approaching completion, and the premises as newly-adapted to the purposes of first-class baths and assembly rooms will shortly be in use.

THE Streets and Buildings Committee of the Edinburgh Town Council estimate their total expenditure for the ensuing year at 41,625 $\frac{1}{2}$ l., and the total receipts on account of ex-

penditure at 5,500 $\frac{1}{2}$ l. The expenditure on account of drains and sewers is estimated at 11,505 $\frac{1}{2}$ l., and the receipts on account of expenditure at 570 $\frac{1}{2}$ l.

A LARGE number of labourers are at present employed on the new harbour works at Calais, with the object of getting the harbour so far completed that it may be used during the Paris Exhibition. April next is the date proposed for the opening of the harbour. All the docks are well constructed, and the two principal ones are of enormous size. A series of small docks, in the form of a canal, with dams and bridges, run from east to west, forming a half-circle round the town very close to the site of the old fortifications.

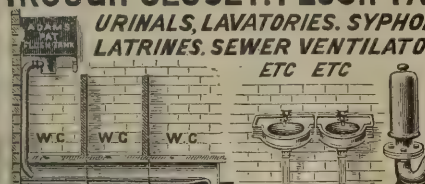
THE streets of Barnet were lighted by electricity on Saturday night. There are seventy-one lamps, each placed on a strong iron post 12 feet in height, and fitted with a reflector. The electricity is conducted over the town by about 5 miles of hard-drawn copper wire. When the wires cross main thoroughfares they are laid underground in creosoted wooden troughs, and are insulated with rubber and encased in lead tubes to protect them from mechanical injury. These underground wires pass up through the lamp columns to the globes, and each column is provided with a small door, so that, should it be required, a switch for turning off any particular lamp independently may be used. Machinery for supplying from 1,000 to 5,000 lamps for use in private houses and places of worship is also proposed.

A LEASE of the Doddington Quarries, near Wooler, has been taken by Messrs. Thomas Gibb & Sons, of Auchinlee Quarries, Cleland, from Lord Tankerville, of Chillingham Castle, Northumberland.

IT is computed that about 25,000,000 bricks will be required for the Manchester Ship Canal in the various buildings, &c., connected with the undertaking. In the excavations at Lymm, a bed of clay of superior quality has been found, more than sufficient to make the necessary quantity. Mr. Thomas Walker, the contractor, has laid out a field with all the required plant for the manufacture of upwards of 100,000 bricks weekly, and is making preparations for putting down another mill, which, when completed, will, with the present one, be capable of turning out a quarter of a million weekly. A line of rails has been laid from the excavations to the top of one of Murray's patent wire pug-mills, and the clay is discharged from the waggons direct into the mill.

THE contract for building a new organ chamber for Naburn Church has been let to Mr. William Denison, of Normanton.

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THE additions to the Lintrathen Waterworks at Dundee are making good progress. At present 6,789 tons of pipes and special castings have been delivered; the total length of the new line of piping now completed is 10,724 lineal yards, or 6 miles 167 yards. A stone bridge at Quiech has been finished, and one of the large main valves placed in position at Shanzie sluice-house. The total payments to contractors to date amount to 26,764*l*.

At the last meeting of the Mersey Dock Board a recommendation of the Works Committee was adopted, that the Great Float at Birkenhead should be deepened to the depth attained by the spring tides, by the erection at the east end of the Wallasey Dock of a system of centrifugal pumps similar to those in course of erection at the Coburg Dock. The estimated cost of the work is 45,000*l*.

THE contract has been obtained by Messrs. Osborne & Stevenson, Pollokshields, for the construction of new waterworks at Gourrock, the contract price being about 1,650*l*.

ON Tuesday the Aireside Ironworks, Huuslet, were offered for sale at auction. A bid of 25,000*l*. was made, but the property was withdrawn, and sold afterwards, privately, at a much higher figure.

A NEW railway station at Paisley, the works of which cost about 80,000*l*., and were carried out by Messrs. Morrison & Mason, contractors, was opened for traffic on Monday.

A NEW line of railway, from Glasgow to Ardrossan, was opened on Monday. The dock, which is in course of construction at the latter place, covers an area of 10 acres, and is expected to be finished in about eighteen months. It will then give a depth of 18 feet on the sill at low water, and 27 feet at high water, so that the largest vessel will be able to float in it. In both the undertakings about 400,000*l*. have already been spent, and, when the works are completed, it is estimated that considerably over half a million will have been expended.

AT the meeting of the Salford Town Council, on Wednesday, sanction was given for the construction of public baths for the Ordsal, and also the Broughton district, the cost not to exceed 16,000*l*.

THE industrial holiday, called in America "Labour Day," was celebrated in New York State on Monday by parades of working-men, picnics, yacht races, and other games. In New York city there was a grand parade of 40,000 men in line. A mammoth picnic of the labour classes was held in Phoenix Park, and there was also a grand parade of the Working Men's

Union at Buffalo, followed by a picnic in Germania Park. The holiday was generally observed in the States of New Jersey, Massachusetts, and Illinois. At Trenton, Boston, and Chicago business was generally suspended, and the labouring classes devoted the day to parading and picnics.

A HANDSOME brass lectern has just been placed in Carmarthen parish church, representing a full-size angel bearing on its uplifted arms the Gospel to the four quarters of the earth, which latter is symbolised by the domical base with its four pinnacles and foliage embellished buttresses, separated by elaborately sectioned panels of tracery work. The book-rest is richly engraved and pierced. The style of the lectern is of the Perpendicular Gothic period. The work has been carried out by Messrs. Jones & Willis, of London and Birmingham.

THE owners of the Mersey Mills site, in Heaton Lane, Stockport, have notified their willingness to accept 6,500*l*. for the plot of land required by the Corporation in order to erect a bridge across the river Mersey to Chestergate. A bridge is much required to relieve the traffic at this point and would be the means of greatly improving the centre of the town.

THE Rathbone Co., of Canada, have established an agency in this country, for the purpose of supplying direct, mouldings, doors, &c., at the lowest possible cost. Their depot at 28 Wharf Road, N.—which we inspected recently—contains an enormous stock of mouldings in nearly every description of wood, of perfectly smooth surface and excellent finish. Messrs. Bryce Junor & White are the agents for the Rathbone Co. at the above address, and will forward catalogues on application.

At the Dalkeith Dean of Guild Court, on Monday, Stephen Hair, builder, was charged with having, contrary to the Dean of Guild by-laws, erected an engine-house on the premises in White Hart Street without having plans submitted for approval to the Dean of Guild Court. Mr. Handyside, solicitor, who appeared for Mr. Hair, submitted that the Dean of Guild Court was not the proper tribunal to decide a matter of this kind, and that it ought to be brought before the magistrates in the ordinary way. No penalty was provided in the Dean of Guild by-laws, and therefore a fine was not exigible. The Fiscal said the object in view was to decide whether the builder or proprietor should be held liable for the erection of buildings without the consent of the Dean of Guild Court. The magistrates were unanimously of opinion that a mistake had been made in prosecuting Mr. Hair, and that the proprietor is the proper party to proceed against. The case was dismissed.

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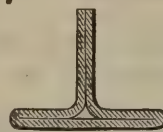
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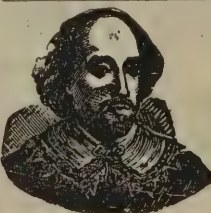


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THE BANKS OF THE DANUBE.

In an article called "Cœur de Lion's Prison," the Vienna correspondent of the *Daily News* gives some interesting particulars from which the following is extracted. How few, he writes, are familiar with the lovely winding river between Vienna and Passau, in Bavaria. From Krems to Melk the Southern Danube winds its way between vineclad hills. Picturesque castles and proud abbeys adorn the shores and are reflected in its pale-green waters. The splendid Abbey of Göttweih, crowning a hill opposite Krems, is far superior from a picturesque and antiquarian point of view to Monte Cassino, the most celebrated monastery of Italy.

Between Göttweih and Melk one abbey after another, more or less magnificent and picturesque, attract attention and call to mind a wealth of reminiscences. The most lovely little abbey of all, with a church that is a treasury of art, is situated at Dürrenstein. Here precipitous rocks rise out of the Danube, and on a craggy mountain that can vie with some of the lesser dolomites stand the ruins of ancient Tyrustein. No place, even in Italy, unites in so small a space so many reminiscences of old and modern times. From a country which is one great vineyard the town—it boasts the proud name of town, but its seventy houses form little more than a village—is entered through an ancient gateway forming part of a battlemented wall which reaches from the top of the mountain down to the water's edge. Strong circular towers stand out along it at small intervals. These walls, which are 5 feet thick and 40 feet high, are covered with ivy many centuries old, the stems of which are like the trunks of trees. The dark-green leaves in layers a foot deep give a soft outline to the wall. Above the entrance gate, in the churchyard, stand the remains of the oldest church of Tyrustein, which date back to the eleventh century, and are well preserved.

In the old "shooting garden," protected by the ivy-grown wall, are the remains of an immense church and monastery of the nuns of St. Clara, built in the thirteenth century. It was abandoned in 1571, when the last Lady Abbess died, and the property fell to the share of the Abbey of Tyrustein. The family of Küenringer, which owned the castle in the days of Richard Cœur de Lion, died out in the fourteenth century. The Lady Elizabeth, being a widow and childless, resolved to retire to a convent, and gave all her property to the brotherhood of Augustines who founded the abbey, the first abbot, in 1378,

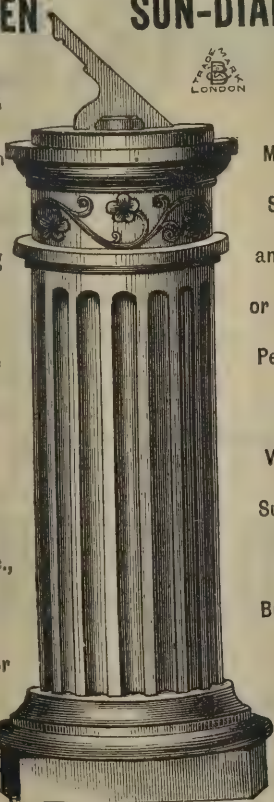
being Stephanus. To Hieronymus, who was Abbot of Tyrustein from 1609 to about 1630, is due the perfect preservation of the church, the abbey, and many other buildings. He restored the church, decorated it in Rococo style, built part of the abbey, and the terraces and towers, from which the eye commands a splendid view of the Danube and the mountains. He turned the old nunnery of St. Clara and its church into enormous barns in which to store the corn that grew on the distant plains beyond the hills.

Perhaps if the abbey, the old castle, the ivy-grown walls, the church, and the convent were shown as curiosities they would not surprise us, or certainly not delight us, half so much as they do. Personally-conducted sightseers are unknown in Tyrustein. We have to discover the place for ourselves. There is a most intelligent and cultivated priest who is prepared to do the honours of the abbey, and, indeed, does them with the grace of a gentleman of the old school. He takes one through the great hall of the abbey with its handsome stuccoed roof and its frescoed walls, opens the shutters of a small turret-room, and leads one on to the balcony, whence the blue hills in the distance and the Danube many hundred feet below are to be seen. The swallows descend in sweeping lines from their nests in the church tower, and rest on the balcony's edge, strangers as they are to the fear of man. A poor artist from Vienna has a delightful summer studio in one of the vaulted rooms. An aged baroness inhabits a suite of rooms which have been hers for many years. The sculptor of the Maria Theresa Monument in Vienna, Professor Zumbusch, is a guest within the abbey walls. Last year, in the early spring, three Americans—a lady and two gentlemen—came down the Danube in a houseboat of their own, and, struck by the beauty of the situation, landed. So charmed were they that they stayed a whole year, with the exception of two bitter winter months, which they spent in Greece. The priest made room for them, and gave them a splendid suite of apartments, one room of which is said to be haunted. Here the choir and the organ in the church could be heard. The happy guests could roam through the hundred rooms of the abbey, or sit in silent contemplation in the church, with its golden light streaming in from an orange-coloured stained-glass window high over the altar, or watch the flitting reflection on the chessboard marble floor of the choir.

A detailed description of the church of Tyrustein would fill a volume. Where the vaulted roof rests on the arches about two dozen beautifully-carved figures are the bearers of

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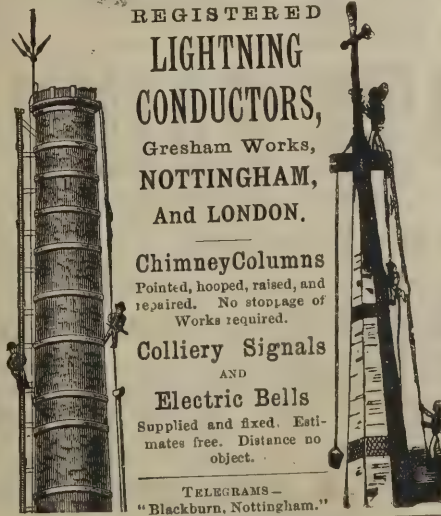
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pictures of the Prophets and Apostles. Four graceful girls in their turn hold the four books of the Evangelists. The pulpit is surmounted by a female figure bearing the cross, and representing Faith, whilst Charity with a burning censer and Hope with an anchor are seated at either side. These figures, with half a dozen angels, are carved out of pear-tree wood. There are beautifully carved choir chairs, with high inlaid backs. On the high altar there is a unique work of art, a globe-shaped pyx, which turns on an axis, and has beautifully carved and gilt pictures representing some event in the life of our Saviour. The equator, represented by a broad silver belt, is covered with fine engravings of the Apostles, and of landscapes and pictures of cities in the Holy Land—Mount Olivet, Jerusalem, Bethlehem, the Holy Sepulchre—and long Latin legends are engraved between the pictures. The globe is surmounted by a canopy representing the star-studded heavens with carved angels. An anchor concealing the keyhole bears the inscription, *Dum spiro, spero*. But the contents of this pyx are more precious still. In it is a monstrance 2 feet high, with massive gold figures of God and His angels surrounding a crystal centre in which is the crescent, formed entirely of rubies and diamonds. From all parts of the monstrance hang large precious stones in quaint old settings. The foot is adorned with pictures in enamel of the Holy Supper, the Crucifixion, and bears the arms and initials of Abbot Hieronymus. This monstrance is said to have been stolen by the French in 1805, and repurchased for 60,000 florins by the chief landowner of Dürrenstein.

#### BIRMINGHAM AND LIVERPOOL SHIP CANAL.

ON Tuesday a meeting of the provisional committee was held in Birmingham, to receive the report of the sub-committee which had been appointed to inquire into the details of the scheme.

The report, which was approved by the provisional committee, states that the object has been to report to the general committee from actual inspection as to three main points:—

(1) The commercial facilities which the route would provide; (2) the practicability of the scheme as regards levels, direction, and general methods of construction; and (3) the probability of obtaining land, water-rights, and other requirements. They spent five days in the inspection of the route, in which they were accompanied by Mr. Shepherd and Messrs. Harris,

Martin & Harris, who explained the details of the plan, and pointed out more especially all the places where the principal engineering or other problems arose, and the methods by which it was proposed that they should be solved. As a result, they report:—(1) They regard the proposed line as one which offers very great facilities for the traffic of very important districts. In Birmingham and its immediate neighbourhood, in South Staffordshire, North Staffordshire, and Cheshire, there is a continuous series of industrial centres, the commercial requirements of which would be immensely benefited by the means of direct communication with each other and the sea which would be furnished by the canal. The line suggested has been projected so as not only to offer conveniences to the districts generally, but wherever practical to serve the special requirements of the individual works, mines, and other establishments. (2) The sub-committee do not assume to give skilled scientific opinion as to the details of route, levels, and construction. They, however, feel that as practical men they are able to understand the broad general lines of the question, and to appreciate the explanations and descriptions given by their advisers, and they feel justified in reporting that the scheme as presented is thoroughly practical, and that it is one which can be carried out, considering the important and complicated considerations of the case, at a reasonable and comparatively economical expenditure. The sub-committee were much assisted in arriving at these conclusions by the experience and information gained by the inspection of the Weaver Navigation, from its confluence with the Mersey at Western Point, near Runcorn, to Winsford Bridge. There they saw a canal such as is proposed in actual and profitable working. They were especially interested in the hydraulic lifting apparatus in operation at Anderton, near Northwich, which forms a complete illustration of what will be one of the most important features of the new scheme. The authorities of the Weaver Navigation have promised to offer every possible assistance to the promotion and completion of the undertaking, which completes the navigation, and which would be largely benefited by it. Entertaining very strongly the opinions which they have expressed, the sub-committee believe that a more complete and detailed survey of the proposed route should now be undertaken. To carry out this suggestion, and to provide means for taking the preliminary steps for making an application to Parliament, the sub-committee recommend that a guarantee fund be at once opened. To promote this object, and with the view of obtaining general

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support to the scheme, they recommend that particulars of what has already been done and what is proposed shall be printed and widely circulated, and that public meetings shall be held in important centres throughout the route, to which the attendance of the municipal and commercial authorities, as well as the general public, shall be invited.

### THE GUILDHALL AT BATH.

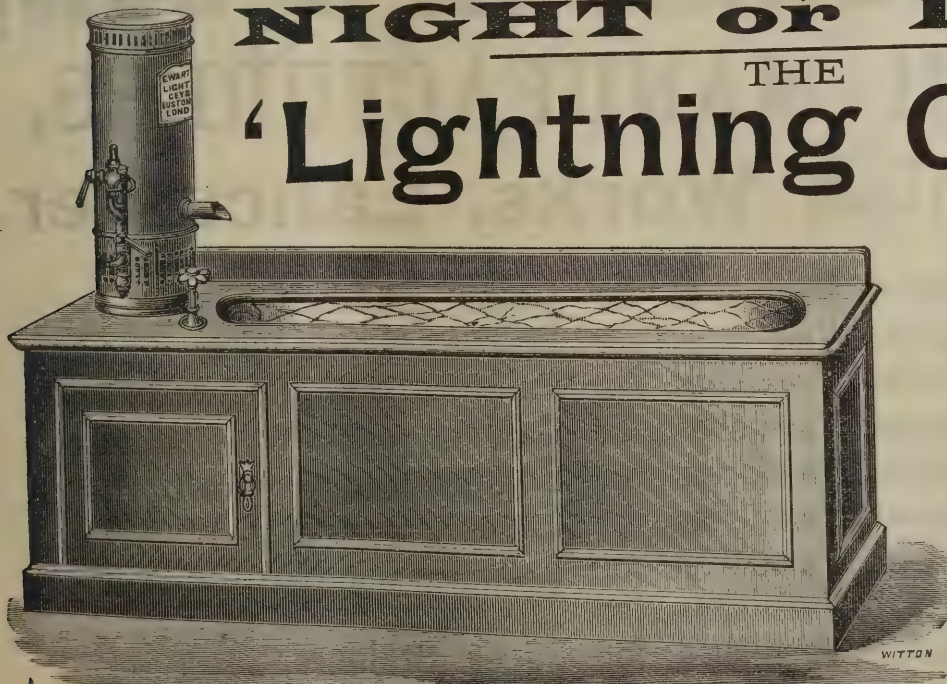
THE redecoration of the Guildhall has been proceeded with during the past few weeks, and the work having now been almost completed, the hall will be ready for its accustomed uses in the course of a day or two. A short account of the appearance which the various rooms now present, the *Bath Herald* says, will no doubt be interesting. Some of our readers may recollect the account we gave in this paper of the decorations of the Guildhall when they were completed on the last occasion. The very neglected state in which the rooms have been of late will, perhaps, scarcely bear us out when we say that on that occasion the public were most satisfied with the result, and one and all of our contemporaries were unanimous in their approbation. The general effect was then produced by the employment of compound colours of delicacy of tint, heightened by the use of one positive colour in a leading position. This system of decoration was in advance of the fashion that has run itself to seed in the employment of colours but little removed from drab, that has been the rule of artists for some time past. The present decoration in contradistinction to this is the employment of positive colours, so far moderated that they shall not be staring, relieved only by colours in contrast, or intermingled with the same colour in different degrees of brilliancy, or even moderated still further until they appear in the smaller details pure white.

The work in the banqueting-room has been carried out with great skill, and the general effect is extremely good, the contrast between the present and past appearance being most striking. The idea has been to obtain a totally different effect to the decoration of the grand pump-room, in which the appearance of comfort was the aim. The ceiling and ornamental style have been decorated in pleasing shades of blue, the elegant enrichments having been picked out in harmonious shades, thus forming a bold and striking contrast, and bringing out the beauty of the Classical embellishments. A greater effect

might perhaps have been effected had a few more colours been introduced. The cove has been painted in somewhat similar colours, and the upper cornices are richly decorated in various shades of blue and cinnamon. The handsome frieze which forms so prominent a feature in the room has been given a rich gold background, and the fluted Corinthian pillars, which form another attraction, are very artistically treated, the groundwork being of old gold colour shaded with orange. The capitals have been decorated with a rich gold bronze *en masse*. The walls have a dado of dark oak colour, above which the panels to the cornice are painted a rich peacock blue. Above the cornice the walls are of a much lighter shade, which has the effect of softening the general tone of the room. The coat of arms over the mantelpiece has been decorated in keeping with the rest of the room, and all the doors have been grained a rich dark oak colour, the door heads being relieved with a stencil ornament in buff.

A great change has been wrought in the Council Chamber from the quiet and sombre aspect which it used to bear, and it now has a bright and cheerful tone. The bed of the ceiling has been repainted a rich shade of cream with style and stencil reliefs, and the cove has a fine stencil design which heightens the tone. The dado here is also of a dark oak colouring, above which to the cornice the walls are painted in colours similar to those used in the banqueting-room but a shade lighter. The doors are grained like those in the adjoining room, while the mantelpieces and door heads are picked out in buff colour. The grand staircase the decorators, Messrs. Cotterell Bros., painted with more colours introduced and a very effective scene is presented, forming a proper contrast to the banqueting-room. The ceiling is treated in a warm tone of cream, the enrichments being relieved in blue and terra-cotta. The festooned cornice is decorated in three or four shades of terra-cotta, light blue and cinnamon. The dado is painted in rich shades of dark terra-cotta, above which, to the string-course, the wall is coloured Pompeian red. The wall above that to the cornice is painted the same colour as the wall in the Council Chamber, a light blue. Another decided contrast to the remainder of the interior of the building is presented in the entrance hall. The bed of the ceiling is painted in a shade of greenish blue, with a handsome stencil style decorated in two shades of red and blue counterchanged. The cornice is finished in five shades of harmonising tints, while between the triglyph ornaments there is a suitable stencil design. The walls are painted in Pompeian red with a dado of rich terra-

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cotta, giving a decidedly warm effect. A Grecian key border runs round the hall. All the brasswork throughout the building has been relacquered. Altogether the work has been done with great taste, and reflects considerable credit upon Messrs. Cotterell Bros., who have carried it out under the direction of Major Davis, the city architect, who selected the colours for the general treatment of the various rooms, and who directed every detail.

#### WOODEN BUILDINGS AT OLYMPIA.

SEVERAL summonses were heard in the Hammersmith Police Court by Mr. Paget, in respect of the wooden buildings erected in the grounds of the Irish Exhibition at Olympia without a license from the Metropolitan Board of Works.—Mr. St. John Wontner appeared on behalf of Mr. Knightley, the district surveyor, the defendants being represented by Mr. Campbell.—The case against Mr. John Henry Rafferty in respect of the arena or grand stand was first taken.—Mr. Wontner said in May last the erection of the arena and other buildings was commenced, and Mr. Knightley wrote to the various parties who had charge of them, giving them notice that they had no right to erect them without a license. He saw Mr. Rafferty, who was one of the executive council, and told him that a license was necessary. Mr. Rafferty sent for the architect, and gave him instructions to apply for a license. An informal application was made, but the buildings were erected and had been in occupation ever since. A fresh application had been made since the issue of the summonses, but the Board had broken up, and a license could not be granted until October 6. As the Exhibition would close about the middle of October, it would be seen that the buildings were used all the time without a license. The parties simply laughed at the Act, but he (Mr. Wontner) should ask the magistrate to teach them to act differently.—Mr. Knightley was called, and said the grand stand overlooked a large open space.—In cross-examination Mr. Knightley said in June last he was told that Mr. Birch, the architect, had made an application to the Board, but it was informal. Drawings of the building were sent in. The Board wished for further drawings, which were promised during the vacation.—Mr. Campbell referred to a plan of the grounds, which showed that the buildings were surrounded by a high brick wall outside of which ran the open road. He said they were 62 feet from the buildings outside the wall.—Mr. Wontner explained that the arena was only 22 feet from another large wooden building in the grounds

described as the Oriental Café.—Mr. Campbell said in the construction of the buildings every suggestion made by Mr. Knightley had been attended to.—In the next case Henry Etherington was summoned in respect of the switchback railway. Mr. Birch was called and said there was delay in getting the drawings of the buildings in consequence of the contractors.—There was a third case against George Baker, who erected the Irish village.—Mr. Wontner withdrew a summons against Mr. Vincent, secretary of Olympia.—Mr. Paget in dealing with the cases imposed a penalty of 40s. upon Mr. Rafferty, and 10s. upon each of the others, remarking that substantially application had been made for the license.—On an application for costs, Mr. Paget said he thought the summonses should have been taken out sooner.—Mr. Knightley said he exhausted every form of entreaty before applying for the summonses.—Mr. Campbell pointed out to the magistrate that the Exhibition was not carried on for a profit.—Mr. Paget granted two guineas costs in the case of Mr. Rafferty, and one guinea in each of the others.

#### A TAY BRIDGE.

ABOUT the end of this month it is expected that the bridge that is being constructed over the Tay to supersede the ferry at Caputh will be finished and opened for traffic. The cost is about 5,000*l.*, and something like 700*l.* yet remains to be raised to relieve the guarantors from responsibility. The bridge consists of three spans, each of the landward ones being 137 feet, and the centre 140 feet long; the roadway has a breadth of 20 feet, and from the summer level of the water up to the bottom boom of the girders is a space of 15 feet, sufficient provision being thus made for the spates to which the river is liable in the spring and summer seasons, and which frequently interrupted traffic by means of the ferry boat. The girders are of the ordinary lattice type, and made of mild steel. The piers up to the water level are hollow cylinders filled with concrete, and resting on a bed of coarse gravel 10 feet beneath the channel of the river, and thence up to the girders they are solid masonry. The floor is also steel of the ridge and furrow pattern, placed longitudinally, and supported by crossed girders at given distances. The girders stand about 11 feet 6 inches high, and a light hand-rail runs along each side of the bridge to prevent passengers slipping through the interstices. The steel floor is covered with asphalt to prevent corrosion, and this,

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again, has a topping of gravel. The abutments on the banks of the river are of solid masonry, with stone pilasters in keeping with the cast-iron pilasters on the tops of the piers. The structure was contracted for by Mr. William Arrol. The bridge will be of great value to Caputh and the circumjacent district of the Stormont within a radius of many miles. On Friday and Saturday a bazaar was held on the river side in aid of the funds for the completion of the structure.

**ROBERTS'S RAIN-WATER SEPARATOR.**

THIS useful apparatus, for which Mr. C. G. Roberts, of Haslemere, Surrey, obtained a silver medal at the International Health Exhibition of 1884, besides other awards, has for some years filled up a want by putting pure and soft water always at our disposal. In both town and country there are many who know the value of rain-water, and our normal water supplies are but at best a substitute in many cases for the efficiency of soft water. In certain cases rain-water may be the principal or only source of water supply. The rain that falls on the roofs of dwelling-houses is sufficient in quantity, as a rule, for all household requirements, and from the roofing of farm buildings sufficient water can be collected for horses and cattle, for dairy purposes, and working engines, &c. To collect and store rain-water in tanks is a simple matter; to collect and store it pure is now even a more simple matter, a result which has been secured by Mr. Roberts's invention. Every one knows that in a short time after rain has been falling the roof, pipes, &c., have been washed clean and freed from impurities of dust, soot, and the like. After that has been done, the water may be allowed to flow freely into the storage-tanks. The difficulty, however, has been to collect rain-water without collecting that portion also which has in the first place washed the roofs. And this is exactly the difficulty that the rain-water separator has disposed of. What happens is, that the apparatus discharges all the foul or dirty water, and only stores the clean water. People, it is said, have taken the trouble to have stack-pipes so arranged that they could by hand direct the water when pure enough into the storage tank, but it is not said that they stop up at night to do so, or that even in the daytime they are always able to be on the alert. The rain-water separator is a self-acting and simple contrivance which effectually attains the object desired. Mr. J. Clarke, F.R.I.B.A., among others, who has had them fixed under his

superintendence and had nearly four years' experience of them, has given favourable testimony as to their merits, they having answered admirably. Many persons use the water entirely for cooking purposes, and also for drinking, as though it were practically filtered water. The separator has no resemblance to a filter. It is not meant to purify water, but, as before mentioned, to secure pure water after it has discarded the dirty water. It is made of zinc upon an iron frame, and the centre part, or canter, is balanced upon a pivot. It is self-acting, and directs into a waste-pipe, or foul-water tank, the first portion of the rainfall that washes

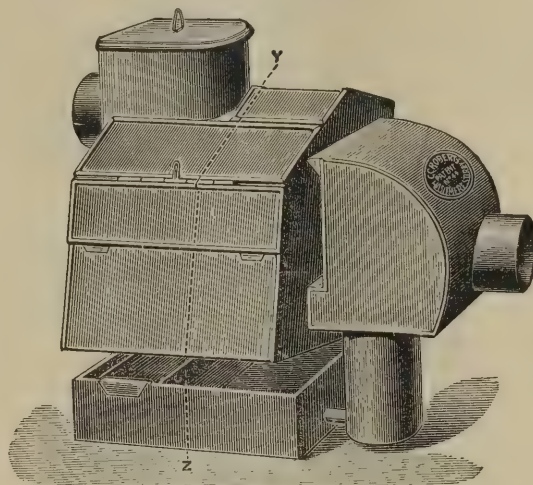


FIG. 1.—Horizontal Separator in Normal Position.

off and brings down from the roof soot and other impurities. After rain has been falling for a certain time, the separator cants and turns the pure water into the storage tank. A vertical separator is used where a single stack-pipe carries the water from the roof to the tank. One length of the stack-pipe is removed, and the separator is inserted and fastened to the side of the house. When a building is provided with several stack-pipes connected by an underground pipe leading to the tank, the horizontal separator (fig. 1) should be used; it is



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placed underground close to the tank, or in any convenient place, in the line of the main pipe. In addition to the underground separator, it is often convenient to have one for a tank upstairs, to supply water by gravitation to the kitchen boiler, or for other purposes. This separator may be placed just under the roof, on a level with the gutter, in some position convenient of access. Fig. 2 represents a section (through the line YZ, fig. 1) of the horizontal separator after it has canted and has begun to run pure water into the storage tank, after the roof has become clean. This change of position is affected by the gradual accumulation of a small portion of the water in the

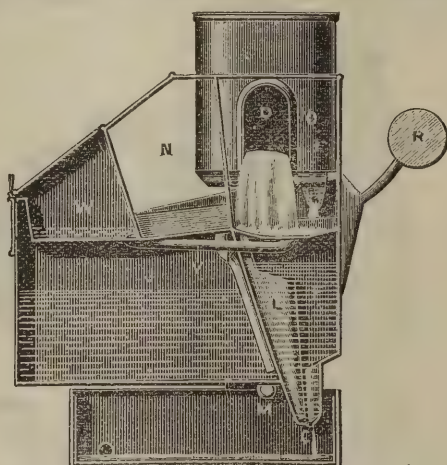


FIG. 2.—Section of Horizontal Separator.  
Pure Water Passing to Storage.

chamber J of the canter; when the water reaches a certain height it makes the left side heavier than the right, and the canter turns a little on the pivot M that supports it, so that the water is delivered two inches further to the right than it was before; and whereas it at first ran through N into the waste-pipe, it now runs through O into the storage tank. In a very slight rain the whole of the water when it is not enough to effectually wash the roof escapes through G without making the canter move. When there is more rain than can pass through the hole G, it rises in F and L, and a small quantity

runs over the side of the funnel, slowly filling the chamber J. When J is filled to a certain height it overbalances the canter and makes the water run to storage through O, as shown in fig. 2. As the water sinks in F it also sinks in L, causing the syphon to act and empty the chamber J. Meanwhile some of the water will have been running through the pipe V into the little chamber W, and the weight of this water will prevent the canter recanting until the water ceases to run from the roof. As soon as W is empty the canter rights itself, ready for the next rainfall, the right-hand side of the canter being heavier than the left when it is empty.

#### GLASGOW EXHIBITION.

ON Wednesday last week a delegation of French artisans visited the Exhibition under the guidance of Mr. Hunter, secretary of the Glasgow Trades Council, and Mr. Beveridge, secretary of the Carpenters and Joiners' Association of Scotland. They were received by Bailie Shearer in the Fine Arts Galleries, and cordially welcomed. They were entertained later at luncheon, Bailie Shearer presiding. He expressed the hope that they had seen much to interest and enable them to give a good report when they went back to France. On the part of the delegation thanks were returned to Bailie Shearer and the executive of the Exhibition for the kindness shown them. The delegates said their object was to examine the various sections, and make reports to their respective trades. They trusted that many Scotchmen would visit the Exhibition next year in Paris.

#### STEEL BUILDINGS.

It is obvious that there is great scope for improving upon the iron buildings in use. They are really not iron, but wooden structures covered with galvanised corrugated iron. Such buildings, of course, are inflammable and ill ventilated. The materials do not lend themselves to any artistic effect. In this respect we are much behind Belgian manufacturers.

M. Dauly, manager of the Société Anonyme des Forges Aiseau, is the patentee of a system of steel buildings which has been a thorough success. These structures have been adopted by the military authorities in Belgium, and as many as twenty-one are at present occupied by the staff of officers, amongst

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THE DOMESTIC ENGINEERING AND SANITARY APPLIANCES COMPANY, 24 HIGH HOLBORN, LONDON, W.C.



whom is the celebrated General Brialmont, superintending the construction of forts on the Meuse. The French military authorities have also made recent purchases. Many residences consist of these steel buildings—clubs, hotels, &c. The buildings are composed of a system of stamped steel plates, which are strengthened and at the same time ornamented by relieved surfaces, similar to the face of cut stone panelling, and these plates have perpendicular flanges round the edges. By the use of a comparatively small number of models—that is, of plates representing parts of panelling, columns, architraves, and lintels—all architectural combinations occurring in the construction of walls can easily be produced. For this purpose the sizes of the panels are multiples of the same dimensions, which is the breadth of the smallest piece employed (architraves of windows), and in the centre of each division the flanges of the panels are perforated. The panels are placed in horizontal courses, to form the two faces of the walls. Between each course a flat iron tie is interposed, the breadth of which determines the thickness of the wall. The lower flanges of the panels are bent over the joints to prevent the rain from penetrating.

These improved buildings do not need any prepared foundations, unless the ground is very irregular, but are placed direct on the levelled ground, having as a base two rigid frames of L-shaped iron, strengthened and tied at the distance of the sides of the walls. The ceilings are formed of stamped metal sheets, which are placed on the lower wings of the irons which form the beams, with which they are securely connected. If required, the ceilings can be made sufficiently strong to support a fireproof flooring. The inner chimneypieces or fireplaces are easily executed with the ordinary shape of marble chimneys, by means of panels of the sheet metal. Ventilation is carefully provided for, the air circulating freely in the space between the two faces of the exterior walls. This space communicates with the interior of the rooms by holes provided in the skirtings, and it is also in communication with the space between the roofing and the last, or uppermost ceiling of the building. By furnishing the chimneys with large openings above, and allowing sufficient size, ventilating shafts are produced, which by the heat of the smoke flues in winter draw up and lead out the air of all the rooms, each room being, according to the principle of good ventilation, provided with sufficient air inlets and with regulating devices for the same. The mode of ventilation is characterised by the continuous passage between the sides of the exterior walls. This circulation attains a velocity

of about 3 feet per second, and prevents the cooling of the rooms by the outer air in winter, and the heating by the action of the sun in the summer.

We have the result here of a thoroughly artistic building, adaptable to any kind of design, made throughout of steel—with provision for every comfort—at a cost certainly not higher than the rude iron buildings they will supplant.

Messrs. Davies, Codner & Co., of 175 Upper Thames Street, E.C., have made arrangements to purchase the English and Colonial patents of the Danby system, and to manufacture in this country. Mr. Davies, the senior partner, has been in the iron trade for many years, and is thoroughly alive to the great advantages possessed by these steel buildings. He has been over to Belgium to watch every process of manufacture, and to inspect the erections in various towns in Belgium. We certainly predict a success for the undertaking, which meets a great want, assuming that the buyer of a building has some regard for architectural effect.

#### IRON FIREPROOF CURTAIN.

THE iron fireproof curtain for the Theatre Royal, Halifax, is the invention of Mr. T. W. Stead, of the firm of Messrs. Elkanah Hoyle & Sons, engineers, Waterside, Halifax, and is the first of the kind that has been erected. It is in two equal parts, one part when open being under the stage, the other part above the proscenium, the lower half being attached by strong steel ropes over groove pulleys fixed above the gridiron to the top half of the curtain, and by the top half being made 1-12th heavier than the lower half and a water-tank combined, has sufficient power by gravitation to pull up the lower half, and the top part descending in the same ratio meet in the centre and completely closes the proscenium opening. When the curtain is required to be opened it is arranged by a screw valve, which, by turning water into the tank, forms an effective weight over the top part of the curtain, and by so doing the lower part descends and the top part ascends, and is left in this position until required to be closed. In case of fire or panic the curtain can be closed in 30 seconds by simply moving a lever, which is attached to an outlet valve on the tank, and as soon as the water is discharged, the top curtain, by being heavier than the lower one, draws it up to it as described before. The curtain works in slides fixed to the 15-inch brick wall, which is built from the basement to 2 feet above the roof, thus

# FIRE! FIRE! FIRE!

## GRIFFITHS' "PYRODENE" FIREPROOFING LIQUID

(NON-POISONOUS).

Transparent Liquid for Rendering Woodwork Uninflammable,

Without altering its appearance, and where Painting is not desired, such as Wooden Fittings in Exhibitions, Churches, Pews, Matchboarding, Theatre Scenes, Wooden Stairs, Joists, Beams, Floors, Factories, Stables, Mills, &c., in fact, Structures of an inflammable nature of all descriptions. Acts as a priming for new Woodwork for Paint or Varnish. Also for rendering Theatrical and Ball Dresses, Curtains, Paper, Felt, Canvas, &c., perfectly uninflammable.

Griffiths' Liquid penetrates the pores of the wood. It lasts as long as the wood itself. It prevents Dry Rot and decay in house timbers. It does not crack, peel, or rub off.

It is perfectly innocuous and free from smell. It will keep any length of time. Any one can apply it. One gallon will cover double that of any other priming.

All Woodwork in new houses should be fireproofed with this liquid, the cost is so trifling in comparison with the preservation of the timber and freedom from risk of fire. If work is desired to be painted afterwards, Griffiths' Pyrodene Paint is best for the purpose.

AND

## GRIFFITHS' "PYRODENE" FIREPROOF PAINT.

READY FOR USE. NON-POISONOUS. ALL COLOURS.

This Paint is manufactured for preservative and decorative purposes equally as for its FIRE-RESISTING qualities. The Fireproof Paint and Fireproofing Liquid is used at some of the principal Theatres in the United Kingdom.

#### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIRS.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 32 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIRS.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly,

To Messrs. Griffiths Bros. & Co., London.

S. C. LOWE & SON.

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GRIFFITHS' "PYRODENE" FIREPROOFING COMPANY, Limited,  
4 & 5 DASHWOOD HOUSE, NEW BROAD STREET, E.C., LONDON.



entirely separating the stage from the auditorium. It is made of two sheet-iron plates, each 1·10 inch thickness, and put together with girder iron, leaving an opening of 3 inches between the sheets of iron, this answering as an air-passage in case of fire, and by a rush of air up this opening keeps the outer plate comparatively cool. The proscenium opening is 21 feet 6 inches by 24 feet, the weight of the curtain is 73 cwt., and the breaking strain of the steel ropes by which it is suspended is 27 tons.

### RUSTING OF IRON.

A PAPER by Professor Crum Brown, on "The Chemical Processes involved in the Rusting of Iron," was read by Dr. Gibson at the meeting of the Iron and Steel Institute in Edinburgh, as follows:—

In this short paper there is, so far as I know, no new fact described. I believe everything, or nearly everything, in it is to be found in the records of chemical research; but as I find that the process involved in the rusting of iron is often misunderstood, I have thought it might be worth while to put together the known facts in their connection.

My attention was first called to the subject by observing what happens when a drop of rain falls on a clean bright surface of iron. At first, for a short time, the drop remains clear, and the bright surface of the iron is seen through it; but soon a greenish precipitate forms in the drop, and this rapidly becomes reddish-brown. The brown precipitate does not adhere to the iron, but is suspended in the water, and becomes a loosely adherent coating only when the water has evaporated. I may premise that, in speaking of rusting, I mean the formation of rust on the surface of metallic iron exposed to ordinary atmospheric conditions. It has been conclusively shown that the necessary conditions for the production of rust are—(1) metallic iron; (2) liquid water; (3) oxygen; and (4) carbonic acid—both the latter being dissolved in the liquid water. Iron remains quite free from rust in an atmosphere containing oxygen, carbonic acid, and water vapour, so long as the water vapour does not condense as liquid water on the surface of the iron. Let us consider now the action on iron of the three substances, liquid water, oxygen, carbonic acid, singly and then two and two. Liquid water, quite free from dissolved gases, does not act on iron at ordinary temperatures. At high temperatures, very rapidly at a red heat, iron is oxidised by

water or water vapour, and is converted into the magnetic oxide of iron. This magnetic oxide is formed on the surface of the iron as an adherent coating, and only when it is detached can the water gain access to lower layers of the iron. Oxygen gas alone does not act at ordinary temperatures on iron. At high temperatures it also converts the iron into the magnetic oxide, which forms an adherent coating. The same is the case with carbonic acid gas, acting alone. At ordinary temperatures it is without action. At high temperatures the carbonic acid is reduced to carbonic oxide, and the iron is oxidised to magnetic oxide, which forms an adherent coating. Liquid water with oxygen dissolved in it does not act at ordinary temperatures on iron.

This is shown by the fact that ordinary water, exposed to the air, does not rust iron if the water contains a substance such as lime, or caustic alkali, capable of combining with carbonic acid and itself without action on iron. As long as the lime or caustic alkali is there, no rusting occurs. When the lime or caustic alkali has been converted by the carbonic acid of the air into carbonate, then, and not till then, can the carbonic acid of the air dissolve as such in the water, and then, and not till then, does rusting begin. Water containing carbonic acid dissolved in it acts on iron at ordinary temperatures, forming ferrous carbonate, which dissolves in the carbonic acid water, forming, no doubt, ferrous bicarbonate. In this way artificial chalybeate water has been prepared by shaking up finely divided iron with carbonic acid water. In this action hydrogen gas is given off. Solutions have been thus prepared containing nearly 1·10 per cent. of iron. If oxygen is present dissolved in the water, it will unite with the nascent hydrogen, and if we have sufficient water, iron, and carbonic acid, the whole of the dissolved oxygen will be thus consumed. The presence of dissolved oxygen quickens the solution of the iron, the tendency of the oxygen to combine with the nascent hydrogen supplying an additional motive to the action. Probably in ordinary rusting no hydrogen actually becomes free, as under ordinary conditions there will always be enough dissolved oxygen to convert all the nascent hydrogen into water. When a solution of ferrous bicarbonate is exposed to an atmosphere containing neither free oxygen nor carbonic acid, it loses carbonic acid, and insoluble ferrous carbonate is precipitated. If free oxygen is present in the atmosphere to which it is exposed, the ferrous carbonate is oxidised to ferric hydrate, carbonic acid being given off. This, if the water is not already saturated with carbonic acid, dissolves in the water.

**NORTHERN**

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ESTAB<sup>d</sup> 1836

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Makers also of the Patent Acme Gas Range, Asbestos Gas Fires, and Acme Bath-Hearths.

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Full Particulars, and Lists of all kinds of LAUNDRY FITTINGS, on Latest System.  
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Have at the above address the largest Show-rooms in London for Stove Grates, Kitchen Ranges, Marble and Carved Wood Chimney-pieces, Tiles, Verandahs, Balconies, Gates, Railing, &c.  
Heating and Ventilating, Hot Water Work, Coil Cases.  
"Burton Weir" Tile Panels and Hearths.  
**"THE GOLD MEDAL RANGE."**  
WORKS, ROTHERHAM. Estab<sup>d</sup> 1854.



We can now follow the whole process of rusting, and divide it into stages—these stages being really separable, if we take proper precautions, but in the usual case overlapping one another. We have, first, the formation of soluble ferrous bicarbonate; secondly, the conversion of ferrous bicarbonate into ferric hydrate, the white ferrous carbonate passing through green and black intermediate substances into the reddish-brown ferric hydrate, *i.e.* rust. We have to note that the carbonic acid dissolved in the liquid water, which is necessary for the process of rusting, is not used up in the process. It is given off during the oxidation of the ferrous bicarbonate to ferrate hydrate, and is thus ready to act on the new surface of the metallic iron. The continuation of the process of rusting is not, therefore, dependent on new carbonic acid absorbed from the air, but the original carbonic acid, if not removed, can carry on the process indefinitely, as long as liquid water is present, and oxygen is supplied from the air. Once the process is started, it goes on more rapidly, because the porous rust not only does not protect the iron, but favours, by its hygroscopic character, the condensation of water vapour from the air in liquid water. A piece of iron, therefore, which has begun to rust, will continue rusting in an atmosphere not saturated with water vapour, an atmosphere in which a piece of clean iron will not rust, because liquid water will condense from such an atmosphere on the hygroscopic rust, but not on the bright iron.

#### LAMBETH POTTERIES.

On Thursday last week Sir Henry Doulton appeared to a summons at the Lambeth Police-court under the Smoke Nuisances Act, for using a furnace so that smoke was not effectually consumed. Mr. St. John Wontner appeared to prosecute on behalf of the Home Office. The evidence was to the effect that on the day in question Police-constable 9 LR saw dense black smoke rising from one of the kilns of Messrs. Doulton's pottery. It continued for ten minutes. Mr. Wontner said it might be arguable whether Sir Henry Doulton was liable, but he contended that he was, and proceeded to read the section of the Act bearing on the case. Mr. Biron said he could not see how the section applied. In cross-examination by Sir Henry Doulton, the constable said that for eighteen months there had been a great improvement in the smoking of the kilns at the works. He knew that a foreman and others had had strict

orders to do everything possible to avoid smoke. After some further evidence, Mr. Biron said he thought the defendant was not the responsible person. He had without doubt spent thousands of pounds, and used every effort by the application of proper apparatus to prevent the nuisance. The defendant had given full and strict instructions also to his foreman and stoker to fully see to the regulations, and he could do no more. He certainly should not convict under such circumstances, for it was evident that if any one was responsible it was the foreman or stoker. He dismissed the summons. Mr. Wontner said he would consult with the Home Office as to a case being granted. Mr. Biron said he would grant a case if necessary.

#### TEST OF A PASSENGER-LIFT.

THIS test had reference to the safety of one of Messrs. Archibald Smith & Stevens's "Reliance" suspended lifts. To make clear its significance it is necessary to refer to the frequent failure of so-called "safety-gears" when unexpectedly called upon under working conditions, even though such gears have satisfactorily passed a form of test at the time of erection. The explanation of the discrepancy between the behaviour under test and under working conditions may be found in the nature of the test applied. The usual course is to suspend the cage by means of a short piece of temporary rope which is cut through close to the top of the cage, the grip gear being previously well oiled and everything ascertained to be in working order. These are conditions under which almost all safety-gears would act, but conditions which never exist in practice, and hence the disappointing result. When a rope or chain breaks in actual work it is because it is worn out, and the point of fracture will be that of greatest wear, but will never be close to the cage. In the case of a hydraulic lift with multiplying cylinder this point will be found somewhere among the wheels of the cylinder. In the case of a lift driven by winding gear it will be found in that part of the rope passing over the drum or V-wheel. In all cases the fracture will occur at some distance from the cage, with the loose ends entangled among the machinery, and probably a heavy weight of loose rope or chain hanging from the off side of the overhead wheel, dragging the safety-gear out of action. Before the safety-gear can act it must pull the loose ends through the machinery, sometimes over or under six or seven wheels, and lift up the deadweight of rope referred to. If not sufficiently powerful

# EDWARD JOHNS,

MANUFACTURER OF ALL KINDS OF

## SANITARY

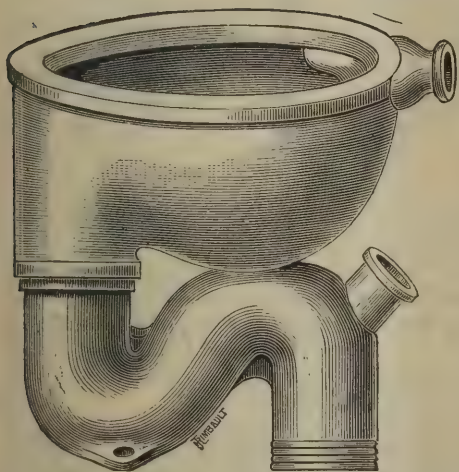
## EARTHENWARE,

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## NEAR RUGELEY, STAFFORDSHIRE.

### ESTABLISHED 1817.

### ILLUSTRATED CATALOGUES AND PRICE LISTS ON APPLICATION.





for this duty, it will allow the cage to fall, restrained only by the back drag of the rope which is preventing the action of the grips. This explains a peculiarity attending many lift accidents, viz., that though the cage has descended from a considerable height, the speed attained does not approximate to that due to free fall. We know of one case in which a man fell 60 feet in a lift-cage, and was walking about within a week apparently uninjured. The ordinary safety-gear has the additional defect of being normally held fast in one position, and at the critical moment may be found to be set fast.

Passing now to the special test under notice, it is only necessary to premise that the "Reliance" gear is designed to act upon the failure of any one of the lifting ropes; that it has for its motive power the weight of the cage and load, so that the greater the load the greater is the effectiveness; and that it is actuated by the opposing pull of two ropes in a series; that is to say, should a given rope break, the safety action depends upon the tension of one particular rope among the survivors, each rope having its own proper opponent. It follows that should any pair of ropes be relieved of tension by the tightening of the remaining ropes, and that then one of the slack ropes should be fractured, its complementary slack rope would be in the worst conceivable condition for actuating the grips.

The lift tested (a "Reliance" suspended lift) was worked by a hydraulic multiplying cylinder fixed at the bottom of the building. The rise of cage was 88 feet, the load lifted 11 cwt., and the weight of cage 10 cwt. The safety-gear had remained without special attention for nearly two years; it was taken just as found, and not even oiled. A pair of ropes was purposely slackened as above described, on the assumption that a careless attendant might make such a mistake. The cage was taken to the top of the building and left empty, i.e. with the smallest motive power for the grips. The point of greatest wear in the rope was calculated and checked by observation, and found to be 150 feet away from the cage end, having five wheels between it and the cage. Of the 150 feet of rope 100 feet hung vertically, representing a weight of 50 lbs. pulling against the gear. Under this accumulation of adverse conditions, one of the slack ropes was then cut through, 150 feet away from the cage, with the result that the safety-gear went into action, preventing the descent of the cage when the valve was reversed for lowering. The cut rope was then replaced by a new one, and all the ropes were adjusted to equal tensions. The cage was again taken to the top of the well, and loaded with 5 cwt. of iron representing an average load of passengers.

These conditions were a nearer approximation to those of ordinary working, and altogether more favourable to the safety apparatus. A second rope was then cut at a similar point measured 150 feet from cage, resulting, as was expected, in an even sharper and more decisive locking of the gear than in the first experiment. A duplicate set of gear was tested with a ton of iron in the cage, with equally satisfactory results.

As already intimated, the ropes had done nearly two years of incessant work. A piece was cut out of the worst part of one of them and sent to Mr. Kirkaldy to test to destruction. Appended is a copy of his certificate:—

Results of experiments to ascertain the tensile strength of one piece of steel wire rope with fastenings received from Messrs. Archibald Smith & Stevens.

Test No.	Circumference in Inches.	Hemp Core.	Ultimate Strength.		Position of Fracture.
			Lbs.	Tons.	
W. 1318	1.90	Main and Strands.	15,495	6.92	Two strands broke together, others separately. All clear of fastenings.

The rope having been in use, and having broken wires, the extension was consequently not taken.

(Signed) DAVID KIRKALDY & SON.  
99 Southwark Street, London, S.E.

#### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

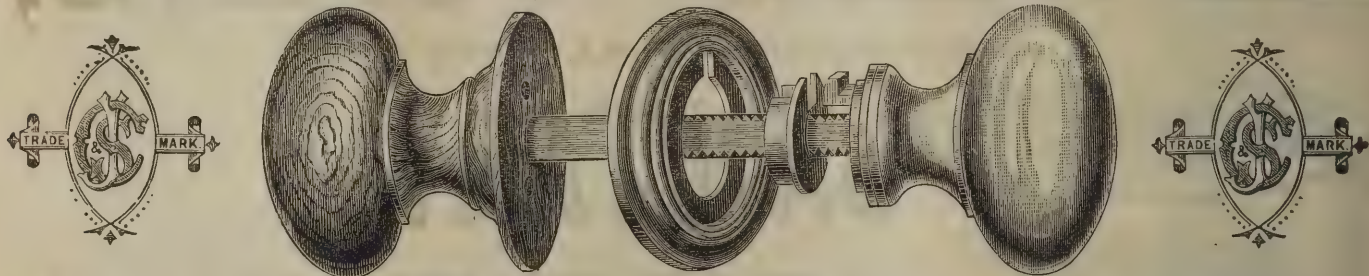
#### APPLICATIONS FOR PATENTS.

12225. Karl Bernhard, for "An improved safety contrivance for windows." August 24, 1888.

12234. John Adair, for "Improvements in the heating and cooling of bakers' and confectioners' ovens." August 24, 1888.

## JAMES CARTLAND & SON, BIRMINGHAM. CABINET, BUILDERS', AND FURNISHING BRASSFOUNDERS, LONDON SHOW-ROOMS: 40 HOLBORN VIADUCT.

N.B.—The Show-Rooms, both in London and Birmingham, are replete with Patterns of every description of Brass Foundry. Buyers are respectfully invited to inspect same. LONGBOTTOM'S PATENT ADJUSTABLE LOCK FURNITURE. MADE IN BRASS, WOOD, AND CHINA. ADOPTED BY HER MAJESTY'S BOARD OF WORKS.



The attention of Architects is called to this Patent Lock Furniture as being the simplest and most reliable yet offered to the public, and whilst embracing all the features requisite in a perfect mechanical device, the total absence of defects usually found in Door Furniture still further enhances its value. In fixing insert the spindle into follower of lock, slip on rose, and screw the loose nut upon spindle until the right adjustment is obtained, then push on the other knob, the key passing through the nut and rose, turn rose half round and screw to door. They are as easily taken off as they are fixed, they cannot get out of order, and are suitable for all kinds of locks and every description of furniture.

Samples and Price Lists on application.

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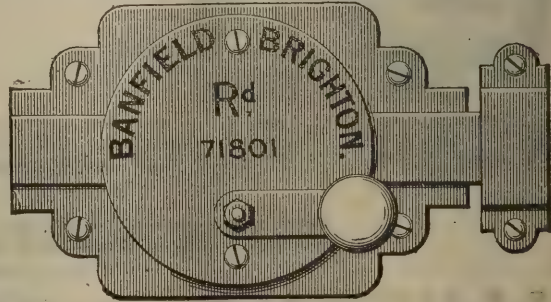
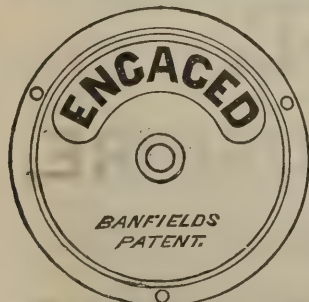
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#### PRICES.

Lacquered Brass, 4/6; Bronzed Brass, 4/9; Nickel-plated, 6/1; Japanned Iron Lock with Brass Indicator, 3/6.

This Lock supplies a want which has long been felt for a reliable and inexpensive means of showing when an apartment is engaged. By simply turning the handle, the door is locked and the word "Engaged" shown on the outside. Conversely, the act of unlocking withdraws the word from view. This Lock is a distinct improvement over all others; there are no wheels to clog, the working parts are covered, and it cannot fall to indicate accurately. It is very neat in appearance, the acme of simplicity, and the cheapest contrivance of the kind yet introduced. It can be easily attached to doors of any thickness, or either hand. A loose key can be supplied at a small extra cost for opening the lock from the outside, an advantage possessed by no other Indicator. The principle can be applied to existing locks, either mortice or rim.



To be obtained of the Patentee, E. BANFIELD, BRIGHTON, Sussex, and of all Ironmongers.

## VOLUME XXXIX. OF THE ARCHITECT.

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12258. Thomas Whittaker, for "Improved hinges for folding-doors and screens." August 25, 1888.

12263. James Gamble, for "A contrivance to hold paper while writing or sketching." August 25, 1888.

12283. Charles Carr Wilson, for "Improvements in gas stoves." (Complete specification.) August 25, 1888.

12325. William Yelland, jun., for "Improvements in sash fasteners." (Complete specification.) August 27, 1888.

12330. William de Morgan, for "Improvements in or connected with the construction of walls or other brick structures." August 27, 1888.

12350. John Elwell, for "A portable covering or roof in galvanised, varnished or painted, corrugated or plain sheet iron or steel, for roofs of hay, corn, or other stacks, booths, temporary buildings, &c." August 28, 1888.

12370. Samuel de la Grange Williams, for "New or improved burners for heating limekilns and brick and other kilns by the combustion of gas, and for other like purposes." August 28, 1888.

12397. William Phillip Thompson, for "Improvements in sewer-gas excluders." (William Wallace, United States.) (Complete specification.) August 28, 1888.

12408. John Rashleigh Banfield Rashleigh, for "Improvements in means or devices for facilitating the insertion of nails, screws, and other fastenings into brickwork, concrete, or other masonry, and for insuring the retention of the same therein." August 28, 1888.

12415. John Meysin Porter and John Arthur Wright, for "An improvement in fastenings for doors and windows." August 29, 1888.

12470. Gurney Lindoe Falconer, for "An improved method of framing sash windows, doors, or shutters." August 30, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

10343. John Robinson Crosthwaite, for "Improvements in the combination of materials employed in the construction of chimneypieces, mantelpieces, or the like structures." July 17, 1888.

10506. John Alfred Radley, for "An improved centrifugal pump." July 20, 1888.

10557. William Iredale and John Haigh, for "A new or improved apparatus for automatically regulating the supply of water or other liquids to cisterns, tanks, or other like reserves." July 21, 1888.

10578. Anthony Dunderdale, for "Improvements in collapsible or folding-shutters, window-guards, sunshades, gates, balconies, and the like." July 21, 1888.

10586. Alexander McLean, for "Improvements in blocks or slabs for paving and other purposes." July 21, 1888.

10669. George Albert Herdman, for "Improvements in the preparation of asphalt for pavements, roadways, buildings, bridges, and other applications." July 24, 1888.

10706. George Evans, for "Improvements in construction of window frame and hanging sashes." July 24, 1888.

10721. Alfred Vincent Newton, for "Improved safety appliances for building in fire." (Alfred Nobel, France.) July 24, 1888.

10757. Frederick Wendling, for "A new paint for stone, plaster, and the like." July 25, 1888.

10824. Charles Torkington, for "An apparatus to prevent the shaking of window sashes." July 26, 1888.

10870. John McLeownan McMurtrie, for "Improved apparatus for fire extinguishing, applicable also for preventing bursting of water pipes." July 27, 1888.

11434. John Jackson, for "Improvements in expansion joints for hot-water or steam-pipes." August 8, 1888.

11775. Regd. Haddan, for "An air purifier and cooler." (Gabriel Paul Stienne, Bruneau, France.) August 15, 1888.

11887. John Casthelaz and Samuel Bruere (of the firm of John Casthelaz, Bruere & Co.), for "Improvements in the manufacture of drying oils, varnishes, and dryers." August 17, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

14460. Philip John Davies, for "Improvements in sink-cones and sink-traps, and casting them with lead." August 24, 1887.

14556. John Stones, for "Improvements in the construction and working of fireproof, iron, and other curtains or screens for theatres and large openings." October 26, 1887.

14601. Thomas Ralph Douse, for "Improvements connected with apparatus or means for checking or subduing fire in buildings and ships or vessels." October 26, 1887.

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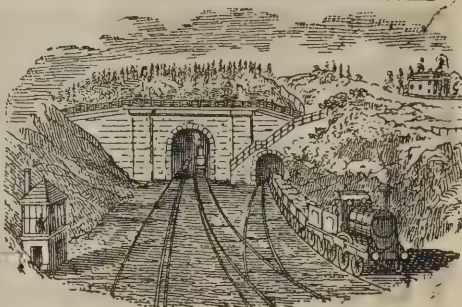
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14630. Wm. Berthold Ihne, for "Improvements in ladders." October 27, 1887.

14639. Henry John Alexander, for "Improved arrangement of ventilator for shafts, pipes, roofs, and the like." October 27, 1887.

14734. Samuel Carnaby, for "Improvements in apparatus or appliances for turning, opening, or closing venetian blinds, ventilators, well-balanced windows, and other objects of a like nature." October 29, 1887.

683. Will. Chas. Adolphus Holzapfel, for "An anti-corrosive composition for the protection of the inside of iron and steel vessels, bridges, piers, and other structures which may be exposed to the action of the atmosphere or water." January 16, 1888.

3181. Edwin Hargreaves, for "Improvements in wire door-spring fittings as regards the adjustment of the torsion on the steel wire or rod." March 2, 1888.

10527. Alf. Julin Boulton, for "Improvements in machines for lifting and delivering bricks and other materials." (Carl Heinrich Eichler, Germany.) July 20, 1888.

#### PATENTS SEALED, AUGUST 31, 1888.

10426. Thomas Moore, for "Improvements in lifters and fasteners for skylights, fanlights, window-sashes, trap-doors, and the like." July 27, 1887.

11324. Joseph Smith and Albert Roberts, for "Improvements in lavatories and in apparatus connected therewith." August 19, 1887.

11362. Henry Harris Lake, for "An Improved parallel ruler." (Benigne Louis Aquettant, France.) August 19, 1887.

11587. John Holt, for "Improvements in latches and bolts for doors and the like." August 26, 1887.

12524. George James Snelus, William Whamond, and Thomas Gibb, for "An improved preparation in the manufacture of cements." September 15, 1887.

12855. John Empson and John Hewitt, for "Improvements in handle and fittings for closet and bell-pulls, and similar purposes." September 15, 1887.

14394. George James Snelus, William Whamond, and Thomas Gibb, for "An improved manufacture of cements." October 22, 1887.

2788. Thomas Austin Sergeant and William Edwin Cook, for "Improvements in mitreing machines." February 24, 1887.

2833. William Illsley, for "Improved means of lubricating moving bars, of clay in or connected with machinery for the

manufacture of bricks, tiles, drain-pipes, and the like." February 25, 1888.

6940. Delley Dietrich Lench, for "Improvements in water-closets, and means for disinfecting the same." May 9, 1888.

7305. Thomas Constantine Fawcett and James Dawson Fawcett, for "A new arrangement of toggle-jointed levers for imparting a double pressing motion for use in moulding, pressing bricks, tiles, fuel-blocks, and other articles." May 17, 1888.

8020. Sydney Turner, for "An improved roof tile." June 1, 1888.

#### NOTES ON SPECIFICATIONS RECENTLY PUBLISHED.

"Improvements in the hearths of fireplaces, fenders, &c., &c." No. 11237. 1887. H. Noble, Little London, Leeds; and G. Haley, 36 Green Street, Leeds. This invention relates to forming enamelled designs upon metal hearths, in imitation of tiles or other ornamental devices. The enamelled surface of the metal hearth acts as a radiator to throw off the heat from the fire into the room. This invention is also very applicable for wall dadoes on account of the ease of fixing.

*Claim I.*—Metallic enamelled hearths and fenders for fireplaces, substantially as shown and described.

*Claim II.*—Metallic enamelled wall dadoes, substantially as shown and described.

"Improvements in the construction of roofs." No. 13680. 1887. J. Season, Hunslet Road, Leeds. This invention refers to the construction of roofs formed entirely of iron and slate, and has for its object the securing in a simple and effective manner the slates to the ironwork of the roof.

"Improvements in apparatus to prevent the bursting of water-pipes by frost." No. 13976. 1887. W. H. Moore, 28 Denmark Hill. This seems a very useful invention, and consists in forming a space or chamber in the pipe, but larger than the pipe, and placing therein a ball or india-rubber bag charged with air. When the water in the pipe expands in freezing, it compresses the air in the ball or bag, and so relieves the pipe from additional pressure.

*Claim.*—Apparatus substantially as described, to prevent the bursting of water-pipes by frost.

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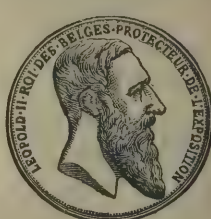
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Friday, September 7, 1888.



# The Architect.

## THE WEEK.

THE proceedings of the British Association were brought to a close on Wednesday evening with a banquet given by Mr. HAMMOND, the Mayor of Bath, which was attended by about 150 leading members of the Association. At the formal closing meeting of the Congress, which was held earlier in the afternoon, a special recognition was made on the part of the Association of the reception accorded them in the city of Bath. It was acknowledged that the reception the Association invariably received was always good, but on the present occasion it had been exceptionally good. Thanks were also returned to the Association on the part of the town for the grant made by them towards the carrying out of further excavations in the Roman baths. The proceedings of the Congress have proved highly satisfactory to those who took part in them, and Sir W. THOMSON, in summing up the results, said that this year's gathering would bear comparison with any previous meeting for the high scientific character of the work attained. He characterised the meeting as an epoch-making one in the history of electrical science, and placed special importance on the discussion in reference to lightning-conductors. The meeting of the Association will next year be held in Newcastle-on-Tyne, and in Leeds the following year. The invitation to meet in Edinburgh in 1891 is likely to be contested by the people of Cardiff, who are anxious to secure their presence for the meeting of 1890.

A COURSE of twelve lectures for the instruction of sanitary inspectors, beginning on the 25th inst., is to be given at the Parkes Museum on each Tuesday and Friday of the week. A nominal fee of five shillings, to cover necessary expenses, is all that is charged to students who desire to attend the course. The subjects to be dealt with will include the "General History, Principles, and Methods of Hygiene," "Drainage and Construction," "Water Supply, Drinking Water, Pollution of Water," "Ventilation, Measurement of Cubic Space, &c.," "Sanitary Appliances," "Sanitary Law—General Enactments, Public Health Act 1875, Model By-laws," "Sanitary Laws and Regulations Governing the Metropolis."

VERY few people out of Tournai have heard of ADOLPHE LERAY. He was a poet of the people, who was not afraid to write on behalf of the humblest classes. His songs are still the favourites in public and private reunions of the Tournaisiens, and above all others are recognised as "household words." Yet the poet was so modest he never sought any other means of publicity than the handing of a draft of a song to a friend. Copies were made by hand, and soon were known. He had no ambition to see his name on the title-page of a book, and as the race of modern poets are the vainest of men, LERAY'S modesty would by itself entitle him to the esteem of posterity. A friend of the poet collected several songs and published them in a volume, which is a great favourite in most parts of Belgium. At first it was contemplated to erect no more elaborate memorial of the poet than a tombstone, but as the people of Tournai insisted on having a share in the work, sufficient money was obtained to pay for a fine fountain, of which a bust of the poet forms a part, in the Place du Becquerelle, where LERAY was brought up. M. HUGO was the sculptor, and the memorial was unveiled on Sunday.

AMONGST the numerous suggestions that are constantly being brought to light, it is seldom that any scheme is propounded the novelty of which has not been anticipated. Among the subjects brought forward during the last day of the séances of the British Association was one by Colonel HAZARD advocating underground railway communication in great cities by means of a subway system. According to his ideas, the main thoroughfares of traffic should be reconstructed. Between the lines of kerb the substance of the street should be removed to a standard depth of 12 feet,

and the excavation so made replaced by four centrally placed subways, the two interior ones being devoted to rapid transit or fast railway trains, moved at great speed between few stations. These railways should be operated by electric-motors, and solid trains specially devised for the service and embodying provisions for safety and comfort. On either side of these centrally disposed railway subways are placed continuous galleries calculated for the housing, inspection, replacement, and repair of all pipes and wires of communication, sewers for local service, water-mains and supplies, gas-mains and service-pipes, steam service-pipes, pneumatic power, post, parcel, refrigerating, and time tubes, electric wires for arc and incandescent lights for street and private use, for power, signals, telegraphs, telephones, &c., and all other essentials or conveniences which are more profitably generated or produced at some central station. Many reasons are against the carrying such a scheme into practice, and many which would interfere constructionally with towns and cities as existing. Besides, companies object to laying their pipes in subways. THEODORE HOOK ordered of an undertaker the grandest funeral he could furnish, but left the undertaker, much to his disgust, to supply the main thing—the body to be buried. Before such a scheme has a chance the city will have to be found, or perhaps new towns like the proposed city of Hygeia planned and built for the purpose.

A COMPETITION is opened in the city of Cracow for the erection of a theatre, which is to be erected at the expense of the municipality. The designs are to be sent in on or before March 1 in next year. For the first design 2,500 florins will be awarded, 1,500 florins for the second, and 1,000 florins for the third.

AN outbreak of fire occurred on Wednesday night which threatened the destruction of the Olympic Theatre, and which was discovered about half an hour after the building had been vacated by the playgoers. The fireman "smelt fire," and, on proceeding to the dressing-room, he discovered that a fire was raging in the adjoining premises. He endeavoured to prevent the flames from attacking the theatre, with a hand pump, which he directed from the office window. Finding that the flames were too strong he laid on the main hose, and with assistance the danger was averted; but the premises were gutted, and the stage and scenery of the Olympic was much damaged by water and removal. Here is a warning that no time should be lost in rendering properties as well as structures of theatres fire-proof.

PREPARATIONS are being made for placing the statue of COLIGNY, the Huguenot, in Paris. The site adopted is behind the Oratoire—a church which is now appropriated to the Calvinists. The transformation of the narrow streets in order to form the Rue di Rivoli has caused the back of that church to be towards the great thoroughfare, the entrance being in an extension of the Rue Saint Honoré. The new statue will do something to lighten a spot which is rather sombre, and as the massacre of Saint Bartholomew was most ruthlessly carried out in the neighbourhood, the site is fitting. M. CRAUK'S statue is admirably posed, and the expression of the figure corresponds with the contemporary accounts of the gentleness of the Admiral. The costume of the time was graceful, and is finely treated by the sculptor. But when the statue is fixed the existing iron railings, it is hoped, will be removed.

ON the part of the Society for the Protection of Ancient Buildings, the secretary, Mr. TURNER, has addressed a letter to the *Leeds Mercury*, thanking the conductors of that paper for the suggestion that the Mayor and Corporation should acquire Kirkstall Abbey for the town. The Society, he says, will gladly assist in promoting the object in view in any way within its power, and begs that the matter will not be allowed to drop. If the promised assistance is not attended by better results than hitherto little will be gained, for the secretary says:—"My committee did its utmost at the beginning of the year 1883 to interest some influential gentlemen, and to try and promote some scheme for the preservation of this most valuable building, but without success."



### THE TRIENNIAL EXHIBITION AT ANTWERP.

THERE are many amateurs holding high offices on the continent who assert that art cannot prosper under the system of annual exhibitions. Painters, it is said, are compelled to scamp their work, as otherwise they might lose the opportunity of appearing before the public, whilst the latter, owing to the frequency of the exhibitions, rarely give adequate attention to what is to be seen. Through the influence of such views the French artists were threatened with eviction from the Palais d'Industrie, in Paris. The Administration of Fine Arts held that triennial exhibitions were more advantageous for the public, and the annual exhibitions of the Salon must have been suspended if some of the Ministers had not exerted themselves in behalf of the artists. Officialdom suffered a defeat which will not be readily forgiven, and sooner or later the attempt may be repeated and the French public deprived of one of the fascinations of the summer.

Any one who is inclined to believe that it would be wise to have a longer interval than a year between the exhibitions of pictures would do well to watch the effect of triennial exhibitions in Belgium. In that country there is some necessity for them, but we cannot say that much advantage is derived from them by artists or the people.

Brussels being the capital, as well as a resort or second-rate Paris for people from all countries, it might be believed that the artists of Belgium would, for their own interests, be glad to contribute to the exhibitions of that city. The provincial spirit is however very strong in the country, and it is in favour of local exhibitions. Some of the best work in painting is produced in Antwerp and Ghent, and hardly a school exists without claiming pre-eminence. A policy of recognition of local talent was adopted by the State. Ghent and Antwerp were placed on the same footing as Brussels, and the capital must dispense with an exhibition until its turn arrives.

Looking at the results, it may be said that with exhibitions as with many other things, the appetite grows with what it feeds on. If we are to judge by the number of visitors that are to be seen in the galleries during one of these triennial exhibitions, it would seem as if the deprivation of an exhibition from a town did not whet the enthusiasm of the Belgians. Last year the Exhibition in Brussels was empty on week-days; only on a Sunday morning, when a penny was the price of admission, could a crowd be found in the galleries. At the close of the season the expenses were far in excess of the receipts. In Antwerp there seems to be still more indifference. Returns are not given of the people who pay for entrance, but at times we have observed that the attendants in livery outnumbered the visitors. If the Exhibition could be said to be made up of works without value, so much neglect would be pardonable. It is, however, not only an excellent Exhibition, from containing many works by native artists who are still working, but it has, too, a foreign department, and a student is therefore enabled to compare the style of the Belgians with the styles that are in vogue in France, Holland, Germany, Austria, Hungary, Italy, and Switzerland. Besides, there are special collections of works of the late NICAISE DE KEYSER and LOUIS GALLAIT, two of the great men of Belgium who died last year.

One excuse may be offered for the absence of the public, namely, that the Exhibition is held in an out-of-the-way place. The Antwerpians do not care to sacrifice time which can be utilised for business, and a journey to the Palais de l'Industrie means going to the very end of the city. The building containing the pictures stands in a garden which is used for concerts, fireworks, &c., and is not unsuitable for an exhibition of works of art, but the inaccessibility of the place will not be condoned.

The great hall is assigned to sculpture, designs, engravings, &c. A bust of Lord SALISBURY, by Mr. BRUCE JOY, is, from its fidelity, quickly recognised among the crowd of similar works. The power attained by Germany on the continent is seen in the number of statues and busts of the rulers of that empire. How long Belgium may be permitted to exist as an independent kingdom is one of the problems of politics; but at present the wisest course is supposed to consist in showing that the French aversion to

Germany has not infected the Belgians. Hence the variety of busts of the three emperors, and the habiliments of woe which shroud those of WILLIAM I. and FREDERICK III. The correspondents of French journals have sneered at the efforts which are made for preserving a friendly feeling between Belgium and Germany, but it may be supposed that the Belgians are the best judges of their own interests. If the exhibition of German pictures can be of any use in staving off the *dies ira*, it could hardly go further than in Antwerp.

The great change in style is exemplified by a comparison between the works of DE KEYSER and GALLAIT and those by modern artists. The late head of the Antwerp Academy seemed to recognise the tendency of our time, and he went more and more towards realism. DE KEYSER is represented by works of many kinds, but the picture of a Spanish procession in Holy Week is his masterpiece. It is true to place and time, but what is most remarkable is the skill shown in characterisation; priests, beggars, grandees, all bear the mark of the South, and it is easy to recognise by his mien that the bearer of the cross, although clad from head to foot in the black garments of the Misericordia, is a gentleman. Even on Good Friday it is not to be expected that Spanish fervour would be entirely of the sombre cast, and the excitement of some faces suggests that the ceremony bears some relationship to pastime. A finished sketch is also shown of the picture devoted to Flemish artists which is found on the walls of the Antwerp Museum. It was painted in rivalry to DELAROCHE's famous *Hemicycle*, and will stand a comparison with that work. The subject was a favourite one with the artist, and we understand that he painted no less than six variations of it.

The principal work by GALLAIT which is seen at Antwerp is the well-known one showing the funeral chamber of Counts EGMONT and HORN, who are represented lying together, with their heads once more placed on their bodies. The Spanish governor is present, and the scene is one which allows of the display of various emotions. It is painted with much care, but with less finish probably greater effect might be gained. The artist's *Art and Liberty*—a Bohemian fiddler—was on its production at once made popular by the means of lithography. It seems to be a study in monochrome rather than a picture. It is to be regretted that when a Salle Gallait was proposed, more was not done towards securing the masterpieces of the artist. The *Temptation of St. Anthony* surpasses any of the works seen at Antwerp, and we could name others which are sufficient to create a reputation.

Last year the Antwerp artists grumbled over their treatment in Brussels, and as some artists in the capital expected reprisals, they did not venture to send works to Antwerp. Among the pictures from Brussels, the first place must be assigned to M. JULIAAN DE VRIENDT's *Daughter of Jairus*, a large work which is based upon customs which still exist in the East. The moment selected is when CHRIST entered the house. Our LORD is clad in white. The countenance is of an ideal kind. It will perhaps be compared with ARY SCHEFFER's picture; but there is more tenderness, more dignity, and a more quiet power about the Belgian artist's creation. PETER, who stands near, is not the old man with the bald head that so often appears in Italian scripture pieces. In the picture he is shown to be a vigorous enthusiast, whose aquiline nose and dark hair denote a Hebrew of the Hebrews. The daughter of JAIRUS lies upon a mat placed on the ground. She is clad in white, and near her is her mother, who is supposed to have cast herself upon the ground. Around are the hired minstrels and mourners. The whole work has a feeling about it which is rarely to be found in modern scripture pieces. The colour is exquisite, and M. DE VRIENDT has proved he possesses an insight into the spirit of scripture which we hope may be often exercised. M. ALBRECHT DE VRIENDT, who has watched the progress of his brother's picture with anxiety, has only two pictures in Antwerp—*The Old Age of Vondel* and *The Anniversary*—which are marked by the qualities that become the head of the Brussels school.

The Antwerp school is, of course, amply represented. The president of the Academy, M. CHARLES VERLAT, has seven works, the largest being an immense picture of a lion, lioness and cubs. The owners of his works have



enabled strangers to judge of his skill in figure, landscape and animal painting. It is unfortunate that the fine historical painting for the town-hall, which has engaged so many of M. VERLAT's days, is not in the Exhibition. M. VAN DER OUDERAA has a reduction of his picture, *The Repression of Perjury*. The larger work is to have a place in the Assize Courts of Antwerp, which will be adorned with several of his works. It appears that in 1569 a German soldier was executed in Antwerp for this worst of crimes, one which would strike the sword from the hand of justice and confound the innocent with the guilty. In those days there was an altar, surmounted by an immense crucifix, in one of the streets near the Steen or prison on the quays. It was for the condemned. The man kneels at the altar with a monk, and on both sides are seen the figures of mounted and unmounted officers of justice, and other persons who await the rising of the prisoner. He is clad in a uniform that once was red, and the colour offers a contrast with the brilliant crimson of the Mephistophelian fellow who serves as executioner. There are some more of the painter's illustrations of the penal history of Belgium.

The pictures of English battle scenes, by M. SCHAEFELS, are known everywhere through the glaring lithographs. In the Exhibition is another work of the class—*Siège de Flessingue*—when the English vessels overcame those sent by the Dutch, who were then ruled by the foolish LOUIS BONAPARTE. In this work the artist shows skill as a marine painter. The combatants are mighty ships of the old type, and happily there is no chance for introducing men who are bleeding to death, the kind of figures in which M. SCHAEFELS takes most pleasure.

M. EDMOND VAN HOVE, of Bruges, has one of his remarkable representations of Mediæval countenances, which everyone somehow feels to be authentic. This time it is a triptique, suggesting alchemy, sorcery, and scholasticism. It is not fair treatment of the old chemists and mystics to place them as if they were related to the physicians, who believed they could put their fingers on the devil, which was supposed to inspire the women who were accepted as sorcerers. The seekers after gold and the highest good were guided by a rigid logic, whilst the doctors of medicine cared little for it—indeed, as many of us know to our cost, the art of reasoning is not always in our time considered to be a necessity with the men who are authorised to heal us. In the central compartment of the picture a young woman, who is nude, is seen lying upon a table. A doctor, with a scalpel in his hand, is about to make an incision in her body. The worthy who presides has, however, a theory of his own, and the operator is therefore obliged to leave his work to convince his superior. The two men would serve for DOGBERRY and VERGES, and never was the pomposity and arrogance which come of ignorance better exemplified. An officer who has carried the girl looks back on her with as much indifference as if he were an hospital porter, whilst the young registrar enjoys the scene and forgets to report the discussion. The victim has a dazed look, as if she hardly realised her condition. M. VAN HOVE has found so much pleasure in ugliness that few critics could suppose he was capable to paint the nude with the power seen in this picture. Near it is one of M. ANTHONY's pictures which recalls the old illuminator's work. The subject is the legendary marriage of St. CATHERINE, but we have seen other works by the painter which deserved to be preferred for richness of colour and beauty.

(To be continued.)

#### LORD GRIMTHORPE ON RESTORATION.

THE following is extracted from a letter written from St. Albans by Lord Grimthorpe to the *Times*, apropos of the Society of Antiquaries' instructions on restoration. In his letter, after giving his concurrence to all that was said against the action taken at Cossey Church, if the account of the treatment of the church is not exaggerated, he writes:—

The more one studies their instructions on "what would appear to them to be the duty of the guardians of churches," the less of any accurate or practical information one finds in them, and the more vague, abstract, and absurd is their philo-

sophy. What are we to make of their fundamental proposition that "every one of our ancient parish churches contains in its fabric the epitome of the history of the parish, frequently extending over many centuries?" This no doubt seemed to its composer and adopters a piece of very fine writing. I should like to lock him up in any ancient church of his own choosing, with meat and drink and a candle against ghosts, until he had composed an epitome of the parish history there. That is the proper kind of test for that kind of hazy rodomontade. He neither knew nor thought what he meant, except to write something that would read well as a maxim, to carry whatever he liked to build on it. And thereon they do build this further dictum—that "it would appear to them to be our duty not to 'restore,' but to preserve a church . . . and to preserve, so far as practicable, the record of what has been its state during all the period of its history." Even if that were of any consequence, compared with its use and beauty, I should like to know how the state of a building during all the period of its history, in which it is assumed to have suffered a variety of changes, and generally has, is to be recorded by crystallising the last of them until it vanishes into ruin.

Apart from the folly of such pretences of practical advice, the accidental adoption of these principles by too many people on other grounds has caused the ruin of many of the finest towers and of some whole churches, and would have ruined many more. The vicar of St. John's, Chester, after that once beautiful tower fell, published the advice he had received from the Society for the Ruination of Ancient Buildings, as I always call it, on no account to attempt its restoration, but to shore it up, or build brick walls, or anything that could not possibly pass for restoration. So it fell. So did the grand steeple of Chichester while they were trying, too late, to save it, and the tower here was just saved while it was actually sinking by the late Mr. Chapple, to whom Scott left it entirely; and so was the central tower of Hereford when Professor Willis warned them what was going to happen, and the west one did fall and part of the nave with it. Nothing is more certain, now that we have had to do it, than that this cathedral was going to fall very soon in half a dozen places, after all the 40,000*l.* that Scott had spent in shamefully careless restoration on antiquarian principles, and that it would have been a heap of stones by this time if Mr. Evans and his confederates had got their way nine years ago, and if it had not been restored in the sense of rebuilding nearly the whole of its chief fronts and windows, and some of the pillars, and a great deal of the walls, and redoing some of Scott's bad work just now. Nobody but a set of ignorant pretenders would write as these anti-restorationists always do about the possibility of keeping up old buildings by shoring and cementing and such like temporary makeshifts. The commonest mason here knows better.

They are prudent enough to say for the public what they evidently do not mean—that they "do not overlook the necessity of adapting the buildings to the wants of the present day," for they proceed after a few lines to contradict it by saying that "the ancient record" (a favourite cant word of theirs for "work") "should not be wiped out to make room for the new." Then how is the new to be got in? "Nor falsified by making the new a servile imitation of the old." But that is the very thing they have always been crying out at my not doing here, since they could not deny any longer that rebuilding was absolutely necessary. So long as we employed architects, they too were always insisting on copying old work which every competent mason could see had always been cracking and bursting because it was designed in as great ignorance of mechanics as most architects display now. The real truth is, what I have written often before, that these noisy antiquarians hate good restoration, because it does resemble old work so much as to puzzle them and get them laughed at, and they frighten weak architects out of their senses, as they latterly had Scott especially, though he hated them and at one time knew better than to mind them. And people in general have got afraid of restoration because it seldom does resemble old work. No doubt it is provoking to an antiquary to harangue a peripatetic party, or the world, on the ancient beauties and modern ugliness of a building, and then to be told by somebody who has seen it all done that you have been praising and blaming just the wrong things, as has several times happened here, and I dare say elsewhere, though very few restorations are done well enough for that.

Then they display their knowledge by telling us that "uniformity of style was very rarely a characteristic of our old churches, and therefore that a part of the building or a piece of furniture is to be judged, not by its conformity to this or that style, but by its fitness for its place and for the work it has to do." In other words, because the five Gothic styles mix freely without uniformity, therefore any bad sham Italian, and every bit of painted deal Georgian churchwarden carpentry, and the flat brick walls which cut off the porches and closed the ends of these aisles, and the rubbishy bit of Queen Annery which Buckler, the architect and antiquary, called "the massive Gothic arch" of the central porch, being all "fit for the work



they had to do" were sacred records, and those who substitute better things and more like the original for them, are sacred in another sense or language.

From architecture Messrs. John Evans and Co. rise into theology. The fact is that these people have altogether mistaken their business position, and floundered more hopelessly out of their depth than ever. The late Mr. Fergusson, who knew more of the architecture of the world than any man who ever lived, or probably will live, in the last paper that he published, I think, said that few people can now regret that we defied all the antiquarian and other clamour here (which was primarily raised by Mr. Evans), though he added that nobody but Sir Edmund Beckett would have faced it. He had long before warned mankind against the mistake and absurdity of confounding architecture with antiquarianism. Indeed, they go on opposite lines. Architecture is decorative and good building. Antiquarians care nothing about that, and say so when they are as honest as Mr. Evans's predecessor, Lord Carnarvon, who, when he wrote to scold us for resolving to restore the old proportions of this cathedral, confessed that it was ugly as it was, but it was "interesting." I replied that he might cultivate as much interesting ugliness as he pleased at home, or at his own expense, but we declined to do it for him. They had better also imitate the candour of a very different ally, Mr. F. Harrison, who, naturally enough, from his well-known opinions of what goes on in churches, wrote in some magazine last year that those who want better arrangements or to get rid of existing things that they do not like in churches should build new ones—a process which may manifestly go on for ever as they successively decay into "interesting ruins."

I am not going to expatiate on principles of restoration. You know, and have said, that I abhor principles. No good or great thing was ever done by them, but all by the genius of common sense, with the requisite special knowledge. I will not even write now the reasons why restorations are generally done so ill. But bad as they mostly are, if all our churches could be suddenly restored by the wish of the antiquaries to their ante-restoration state, ninety-nine out of every hundred church people would vote for suppressing them, if not for hanging every man who called himself an antiquary or an archaeologist, or any other of their designations.

### THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

(Concluded from last week.)

ON Thursday the members were received by the Marquis of Bute at the Island of Bute.

#### *Rothesay Castle.*

This castle was visited first, and Rev. J. K. Hewison, in describing it said that the peculiarity of the castle consisted in its being almost a perfect circle. It had walls 20 feet high and 8 feet thick, flanked at the four corners—the north-east, the south-west, and the other two diagonal corners—by great towers 33 feet in diameter. The interior was the older portion. It was supposed to have taken the place of an older fort, and that this was the reason why the circle was not absolutely perfect. The circle was from 135 feet to 138 feet in diameter, and the doorway faced almost due north. In the castle the lower part of the wall was supposed to be the most ancient—work certainly anterior to the thirteenth century. The first notices they had of the castle were in the Norse records, in which it was stated that the men from the north sapped the walls, which were soft, and killed the Stewart upon them. From examination of the walls they would see that they were of two kinds of masonry. The one below was apparently the same kind as they would see at St. Blane Church later in the day. It seemed to have terminated in regular battlements, because outside they would see the places where the spouts had been. The barbican had been projected from the circular walls early in the thirteenth century, and the great barbican had been constructed in 1540. The old wall had been paved on the top, and when the castle was rebuilt early in the fourteenth century a different kind of masonry was placed on the top, while a passage was left in the heart of the wall as usual in the thirteenth century. There was no keep, but the walls were defended from the towers, and that they also had a separate means of defence was borne out by the fact of the remains of stairs to the curtain walls. Of those stairs there were four, and one, the most perfect, was called "the bloody stair," either from some desperate encounter which had taken place upon it, or from the ruddy hue of the stone of which it was composed. The towers apparently had doors inside connected with the side walls by means of wooden gangways, used in times of peace and taken away in times of war. Old records showed that Allan the Stewart in 1204 gave Kingarth to Paisley Abbey, and he probably built the church of St. Blane and this part of the

castle. The great bartisan was only added in the time of James V., and the coat-of-arms over the doorway had the two unicorns, first used by James IV. The portion of the barbican near the entrance became the royal palace in the end of the fifteenth or beginning of the sixteenth century, and it was divided into regular apartments three storeys high. In 1228 and 1263 the castle was taken by the Norsemen, and in 1312 it was destroyed, while in 1334 it was rebuilt. In 1541 Sir James Hamilton was employed to renovate the castle, but he embezzled the money and was tried for the crime. The little chapel in the castle was dedicated to St. Michael, was in two storeys like the Ste.-Chapelle in Paris, and was supposed to date from the thirteenth century. In the fifteenth century they found records of a court for the payment of the chaplains of that ancient place. The passage contained an old dungeon in which Patrick Lindsay was confined by James IV. for the action he took in defending his brother, David Lindsay. Speaking of the drawbridge, he stated that it stood on the original oak piles which had been found burned down to the water edge. The castle was first explored in 1816, but nothing of any consequence was discovered. It was again re-examined in 1871-2, and traces of all the buildings inside the walls were laid bare, and they could see that there were a great many of them, but still no relics of any importance were found. In one part of it ashes were discovered, which had evidently come from a smithy, showing that forgework had gone on within the castle walls.

Mr. E. P. L. Brock said it was perhaps the oldest castle remaining in the country. From its masonry they could trace that it was even older than Bothwell Castle. In it they had many signs of the gradation of one class of early work into another. The circular form of the court would recall the castles of Listowel, Launceston, and Tremmerton, in Cornwall, which all showed peculiar local feeling. In the middle of the twelfth century, which was the date of the oldest portion of Rothesay Castle remaining, they had a form very similar to that of the three castles referred to, and he took it that it was also a local form. The form, in his opinion, was owing to a local peculiarity on the part of the builders who had the work on hand. As far as the masonry was concerned, they had on the inner face of the wall what they would call semi-Norman work or earlier in England; but everything was later in Scotland, and he would fix the date at about the middle of the twelfth century. The chapel was of the usual form, and that an early one. The staircase was external, and the traceries of the windows were very similar to those to be seen in the nave of Glasgow Cathedral, and also in the ruined chancel of Rothesay parish church. The party then visited the parish church.

#### *The Parish Church.*

Rev. Mr. Hewison said they stood on the site of the original Cathedral of the Isles. The ancient parish church was dedicated to two saints. It was called the Church of Kilbrook, or Brook; and the little chapel outside was named the Church of Mary—the Lady Kirk or Kilmory. The old church was taken down first of all in 1692, and having been rebuilt stood until 1796, when it was again removed, and the present structure put upon its site. It was supposed that the chapel was the chancel of the church; some persons called it the choir, but he was not sure about either of these conjectures. It measured 27 feet 7 inches long by 17 feet 8 inches wide, and it could easily be seen from the style of architecture that it dated from the thirteenth century. At that time the Stewarts of Scotland were apparently all-powerful in this place. It was most notable now for containing three beautiful effigies which lay there, he might say, in disgraceful disfigurement. Great controversies had been waged round those. The Marquis of Bute told them that Robert II., in view of certain contingencies, erected tombs up and down the country, and that this was supposed to be one of them. The tomb he referred to was the one on the south side of the chancel, where they saw the effigy of a warrior lying cap-à-pie. There were four theories in regard to the monument. The first was that it was the tomb of Robert II., the second was that it was the tomb of Robert III., and the third that it was the tomb of Sir John Stewart, of Bonkill, who was slain at Falkirk in 1298, while in the fourth place it had been asserted, and he must say almost conclusively proved, that it was the tomb of the eighth Hereditary Grand High Steward of Scotland, Walter, who married Marjory, daughter of King Robert Bruce. The second effigy was believed to be that of Marjory, who was shown dying with a child in her arms. It was stated that the third was that of Angus, Lord of the Isles, who died in 1210, but an inspection of some Gothic lettering on the stone led him to believe it was that of one of the Cummings intimately associated with the island.

Mr. John Honeyman said the architecture of the chapel proved that it had been erected towards the close of the thirteenth century—probably rather later than the chapel within the castle—and this circumstance was strong confirmation of the suggestion mentioned by Mr. Hewison that the tomb he had



described was that of Walter Stewart, as much before his period the chapel did not probably exist. It would be noticed that the building had been considerably altered, as the square windows were not a part of the original building, and the canopied recesses of the tombs were also of later date than the walls in which they were placed.

Mr. Brock expressed regret that such monuments as those in the chancel should be allowed to remain year after year uncovered and unprotected.

At Mount Stuart the party were entertained at luncheon, and the castle was thrown open for their inspection. After leaving, the chapel of St. Blane was visited. The structure was described by Rev. Mr. Hewison. It was Romanesque in form, and consisted of a nave and chancel. From examination of the ruins he had come to the conclusion that they were constructed on an earlier foundation.

#### *Paisley Abbey.*

Paisley was selected for Friday's excursion. The abbey, which was examined, was described by Mr. Loftus Brock. The name of the patron saint, St. Murren, he said, was that of one of those old Celtic saints whose original home appeared to have been Ireland. There was a tradition that an old church dedicated to St. Murren, most probably built by him, occupied the site at very early times. They would see fragments of very early masonry along the south side of the nave and the west side of the chapter-house, including the west front of the curious chapel of St. Murren. This showed that the chapel of St. Murren must have existed from the times of the earliest masonry now to be found in Paisley. The abbey was founded by Walter Fitzallan in 1163, and was colonised by Cluniac monks from Wenlock in Shropshire. It was burned by Edward I. during the wars of succession in 1307. In dealing with the architectural details of the building he pointed to the beautiful western doorway, which was of good First Pointed work. That the building was the work of Scotchmen he had not the shadow of a doubt. That it was different from English work they could all see, although it resembled English work much more than some of the other Scottish work of the First Pointed style which existed in Scotland. They had this interesting evidence regarding the older church, namely, that it was of the same width as the present building, and that its nave also was of the same length, whatever the transepts and chancel may have been. They had evidence, also, that it was intended to erect a tower or spire at each side of the west entrance, and the bases of those towers were before them. They had evidence that while there was an old design partly carried out at about 1170, there was an addition to it about thirty years later. They should see how that design had been altered again and again. Whether the two western towers were ever completed was open to very great doubt. He ventured to think that the whole design was that of Abbot Tarver. From the evidences of masons' marks, he concluded that the pillars were of later date than the wall beside them. The occurrence of semicircular arches was no criterion of date in Scotland; they would find them in the earliest works which Scotland had produced, and in the latest. He compared the masons' marks found in the different parts of the building, and drew the conclusion that one body of workmen executed one mass of work and another another. He called attention to the curious way in which the builders of the arches incorporated their work in the older and thicker work of the towers at the west end. The structural evidence was conclusive that the church never had—he meant when these pillars were erected—a stone-vaulted roof, and that it was always intended for a light ceiling, the clerestory being too light to support a heavy roof. In like manner the central tower could never have been a very strong or tall one. As to the choir they would notice its extreme length, and, from the fact that the wall was perfect on both sides, with only one small doorway on the southern side, it was evident that there were never aisles to the choir. From the appearance of the beautiful sedilium, and from the mouldings all being of a later look than those of the nave, he concluded that this was the work of Abbot Schaw, who was known to have erected a great number of buildings there towards the end of the fifteenth century. The work was delicate and graceful, and much of the masonry was in good order. It was there that a great number of the masons' marks were to be found different from those in the nave. He concluded, therefore, from the evidence of the architecture and of those marks that they were within a later building than the nave. The plan of the church—an extended parallelogram—was not so unusual as many might be led to believe. Looking back towards the nave, they would notice the bases of the two piers which supported the central tower. The piers were of interest, because they gave them by their capitals which remained the height of the springing of the arches which supported the tower. On looking at the south-east pier, they would notice that when the tower fell there must have been a tremendous strain naturally upon the masonry. The upper part was pushed out below the lower, which was its original position, six or seven inches. On the two western ex-

tremities of the choir where the other piers stood, they disappeared altogether at the fall; it was then that the masonry was rebuilt. They would see how very narrow were the arches which led from the two aisles of the nave into the transepts. They had nothing at all like that in England. The outline of the arches was clearly Pointed, but the date was that of Abbot Tarver. The north transept remained in good condition, and was extensive. It was of moderate height in comparison to the nave. It might be reasonably asked how it came that the transept was so low and the nave so high, and did the chancel follow the height of the nave or the transepts? He concluded that it followed the height of the transepts. His reasons for that opinion were twofold—first, that the walls were not strong enough for any very great height, existing, as they did, without buttresses; and, secondly, that without buttresses it would have been impossible to have carried the vaulted roof of stone over them.

Mr. Ewan Christian called attention to a very remarkable stone, which evidently showed the action of fire, and also the particular tooling of the thirteenth-century work.

The party then proceeded into the cloister gardens, and thence into the St. Murren Chapel, and subsequently visited the museum in the town.

At the afternoon visits were paid to the Hunterian Museum, Glasgow, and to the Exhibition.

At the evening meeting in the Corporation Galleries the Marquis of Bute read a paper on the arrangements of the interior of Glasgow Cathedral in reference to certain foreign examples.

#### *Masons' Marks.*

Professor Hayter Lewis, F.S.A., read a paper on the subject of masons' marks. He said that Scotland possessed a larger number of such marks than could be shown down south. They were found cut on the stonework of nearly every Mediæval building of importance, and on very many buildings of greater antiquity such marks were now used as much as they ever were, but they were hidden. Proceeding, he said that the first point was to ascertain whether they were hereditary, descending from father to son, with such slight alterations as might serve to distinguish them from each other. Certainly in many cases it was not so. On the other hand, there were cases in which the same marks were used at the present day by members of distinctly the same family, there being some slight differences for the sake of identification. The next point was, Was there any distinct mark which would serve to distinguish the members of any particular lodge or company? and he might say shortly that he could see no sign which would thus define a separate group of workmen—such a sign, for example, as that of the crown above the hammer, so well known on Scottish tombstones. Yet there were certain cases in which one would expect to find them if, as was generally supposed, the companies were under clerical guidance. The only method left by which one could trace the work, and the progress of any particular lodge or fraternity from one building to another, or from one date to another, so as to ascertain the progress of an art by the consecutive history of two or more buildings, was by taking a group of separate but well ascertained marks in one of them and tracing out the same marks, if possible, in another. All evidence seemed to point to there having been bands of skilled workmen attached to great monasteries, cathedrals, and in later times large cities, whose example and training influenced the districts around. When works of great magnitude were in hand, these bands were, no doubt, increased; and when the works ceased they were lessened in number, the members dispersing here and there and leaving their marks in various places, much as masons now did at the finish of some great work. But he found no distinct trace of the general employment of large migratory bands of masons going from place to place as a guild or brotherhood. As to whether they could find any distinct change between the marks of the twelfth and thirteenth centuries, when the great change took place in the tooling and the style generally, he felt bound to say that he could not see any distinct or general sign of change. Generally it was found that the same forms which were used in early times were continued in the later, though they were then made more ornate. Putting together the information which they had, they found that certain definite methods of marking the general surface of the stones characterised the masonry of the style which was called Norman; that in the thirteenth century there was introduced with the Early Pointed style an entirely different method of finishing the surface, and that the source of this method was apparently from the East; that masons' marks did not appear to have been commonly used in Europe until late in the twelfth century, and that some of the most prominent of those marks appeared to have been used continuously from very early times in eastern countries.

Dr. Phené, F.S.A., corresponding member of the Academy of Sciences at New York, read a paper on "Further Discoveries of Mounds in the Forms of Animals in America, China, Scandinavia, Greece, Asia Minor, India, France, Spain, Scotland, Ireland, Wales, and England." It was pointed out



how little this curious and interesting subject was known' although high-class works recorded these mounds by many hundred examples. The author had devoted thirty years to the subject, and in so doing had travelled extensively, all the continents being visited, and the mounds, with their respective traditions, the local customs in their vicinities, and the relics found, being carefully noted by him. The similarity of customs and traditions generally led him where to search, and such searches had been most successful.

Following this paper, Dr. Phené delivered a second address on the similarity of objects found in the mounds, and traditions and customs still existing in the localities of these animal forms. Such forms generally contain, or are near, natural caves or megalithic chambers, and this in every part of the world, from the great caves of the Hindoo gods to Weyland Smith's cave near the White Horse in Berkshire, or the cave temple under the Sphinx. The great American serpent in Ohio overlooks the plains of Kentucky, where the Mammoth Cave is.

Saturday was devoted by the members of the Society to an examination of the Roman camp at Ardoch, Doune Castle, and Dunblane Cathedral.

On Monday an examination was made of the antiquities of Falkirk and district and in Linlithgow. At the evening meeting several papers were read:—"Early Christian Inscribed Monuments in Scotland," by Mr. J. Romilly Allen; "Scottish Architecture" (this was given in *The Architect* last week), by Mr. Loftus Brock; and an historical paper by Mr. G. R. Wright.

Dunfermline was visited on Tuesday, and objects of antiquarian interest inspected. The closing meeting took place in the evening in the Corporation Art Galleries, Archbishop Eyre, and subsequently the president, the Marquis of Bute, presiding. Various papers were read, and the Congress terminated with the hearty acknowledgments of the members for the kindness they had experienced in the course of their visit.

### THE ROMAN BATHS.

A VISIT was paid on Monday afternoon by the members of the British Association, who have this year held their annual congress in Bath, to the Roman Baths, Major Davis, F.S.A., the city surveyor, conducting the party.

In describing the work, Major Davis remarked that at least 1,300 years had elapsed since so large an audience had favoured that rectangular bath with their presence, and especially the members of the British Association, which he did not think ever was represented in Roman times. In coming to Bath most people were struck with the fact that it was absolutely a modern city; there was nothing to remind them of its antiquity except possibly the abbey; but beneath the soil of the ground they had evidences of excessive antiquity, and it had been his privilege to unearth those antiquities, the largest and grandest portion of which was where they were then assembled. He would not trouble them with the history of the Roman antiquities in Bath, because those had been so well dealt with in a little book, to which he had had the honour of contributing, and with a copy of which they had all been presented, but he might remind them that the history of that city certainly dated from the year 48, the days of the Emperor Claudius. There was no doubt that there was a city there in 48, and in 80 Solinus, writing of Bath, spoke of the magnificent baths and its temple of Minerva, and he mentioned among other remarkable facts that the temple of Minerva was maintained with a perpetual fire. Geologists would say, of course, that the perpetual fire proved at once that the Romans used coal. Well, he regretted to say that among the ashes he had found there he had not found any coal ashes: all of them proved to be wood ashes.

Although they had a history of the Roman antiquity of Bath, they had no evidence of the existence of baths there—they had the springs there and the springs were always flowing—until 1755. The only record they had of the existence of baths were the antiquities built into the walls of that ancient city. In 1755 the ancestors of the present Lord Manvers, whose property that was, removed the abbey house, which took the place of that where the prior lived previous to the Reformation, adjoining the abbey, and beyond the gallery which they saw. In that year a very large bath was discovered, but unfortunately almost the whole, he believed, of that discovery was removed. The east wall of the bath they were then in formed the west wall of the bath that was then found, and which ran from east to west. The whole or a great part were laid bare, and buildings were afterwards erected upon them, so he regretted to say he could not show them those discoveries. The Corporation of Bath had fortunately become possessed of that property, and he had no doubt that, on a recommendation from the British Association, the Corporation would at once clear the ground and show them the objects of 1775. In 1775 they touched

upon the east wall of that bath, and in pursuing the discovery they went so far west that they came upon the steps of that bath. The dimensions of the bath of 1775 led them very properly to surmise that there would be a large rectangular bath on the west of what they had discovered; but they were under an error in their surmise, and although they gave dimensions for it, and dotted the lines in plans, they had no conception of the great bath that they were able to show that day. Those who were unacquainted with that place would hardly know why he should be so in praise of the bath. Writers had said that the bath was discovered in 1755, but if it was discovered then why did not the Corporation purchase the property above it and clear it out? They did not do so, and there were seven houses standing above it until the present Corporation cleared it out. In 1755, after having proved the existence of the baths, additional buildings were required to be added to the pump-room, and in making those additions the entrance portico and columns were found, and were deposited at the Literary Institute. In 1788 the pronaos of the portico of the entrance to the baths was discovered, and later on one or two points were disclosed about the baths, but it was not until 1869 that a real discovery of any importance was made, and he had the honour of making it. It was a portion of the hypocaust about which much had been said and written.

He could not expect to make all in Bath antiquarians, and the discoveries were partially covered up, but in 1878 he found some steam vapour coming from a certain place. He thought he would investigate the matter—he meant the Mineral Baths Committee, for he was entirely the servant of the Baths Committee. He excavated one corner of the bath and came upon some lead of excessive thickness, and he found signs of a bath being there. But at that time the Corporation of Bath, although they possessed five-sixths of the springs, were unfortunately not possessed of the spring which belonged to the abbey house which was there. The spring really was the drain of that bath, and unless the Corporation became possessed of the spring it was impossible to pursue any excavations, because the ground they were standing on was saturated with hot water, and if they pumped it out the baths suffered for want of water. He laid the matter before the Corporation, but it took them seven years to consider about giving 600*l.* for the little spring, which was now worth 20,000*l.* The Corporation having become possessed of the spring enabled him by a grant of money to explore a Roman drain, which the priors of Bath constructed to draw the water into the abbey house. It was made of pure tin, and he was not aware of any others having been found this side of the Alps. The object of the Roman drain was a useful one. When cleared it enabled them to drain the baths at so low a level that there would be no possibility of any impurity contaminating the baths; and, as he knew the great value of these waters as curative waters, he was particularly anxious that there should be no suspicion of any impurity getting into the waters. In going along that drain, he found a passage of water from the bath along the whole length of which they went, and of the existence of which he was not then aware. He pursued it until he got to a beautiful archway of Roman work, but not before they had had to go through immense masses of masonry that had been thrown down with considerable violence. When they got to the King's bath, they came to a hatchway where there was a sort of receptacle, and in that receptacle, or catch pit, they found two vases, also of tin, and several other things, and a drinking-cup of particular interest. They also found other antiquities, now in the cases in the pump-room. After the catch pit, they went through solid stone walls 2 feet 6 inches thick, and came to the octagon, where was the hot well of the baths. It was 50 feet in length by about 40 feet in width. The wall was built of solid stone, and was cased with lead, the bottom being coated with lead. He cleared out the whole of the remains that were in the octagon. The springs, when he first excavated beneath the King's bath, yielded 116 gallons a minute. He then was fortunate enough to raise it nearly 50 gallons a minute, and recently by stopping a number of leaks which had been going on from time immemorial, and made this city as it was represented on the arms "the city of waters," they now had a yield of 300 gallons per minute. The public press took up the matter, and, the *Times* having inserted a letter of his, it brought an immense flood of letters to the place. Only one paper in the city among five backed him up, and that was the *Bath Herald*. The subject was brought before the Society of Antiquarians, and the Society came forward very liberally and voted 100*l.* towards the excavations, and that formed a nucleus about which a quantity of money was collected. Mr. Murch, who was the Mayor of Bath at the time of the Association's previous visit, and when he (the speaker) was the local secretary, obtained subscriptions and enabled them to pursue those investigations. The excavations were pursued, and they had worked out the whole of the bath as they then saw it. Major Davis afterwards described the discovery of a hypocaust, which he said had been written about more than any other hypocaust, and afterwards



referred to the erection of the new baths by the Corporation at a cost of 20,000*l*.

Sir John Lubbock expressed thanks to Major Davis and the Baths Committee for their reception of them on that occasion. Major Davis had said very modestly that he was the servant of the Baths Committee, and he was sure they were much indebted to them for all they had done. So remarkable a discovery was mainly due to the energy and ability of his friend Major Davis. He had been in correspondence with him for some time, and he had this qualification for speaking perhaps, that he knew a little more than most of them of the great difficulties with which he had had to contend. They all saw how successfully he had overcome them, and he had held out to them the hope that when they returned there some twenty-four years hence, at the next meeting of the British Association in Bath, they might see other works as extensive and as interesting as those which he had described to them that day.

## TESSERÆ.

Raphael's Cartoons.

F. W. MOODY.

THE change of Raphael's style may be stated as an increase of amplitude and mass rather than of any principle of construction, and in his early manner the limbs are more attenuated, the draperies more scant, than in his later works. This change is not peculiar to him. In the progress of art generally, as well as of each individual artist, the tendency is to become broader and more ample. The young student invariably draws the limbs more elongated and meagre than they really are; and I have often surprised a pupil by measuring the true proportion on his work. It is amusing to hear critics condemn those who have adopted a broader style than they approve. They call them "sensual," "pagan," and many hard names, forgetting that all their criticism, however ingeniously they may attempt to conceal it, can never mean anything more than "I like this," "I don't like that," and it is far more likely that the "I" should be wrong than the work they criticise. A sour ascetic will condemn amplitude; a man in the vigour of mature knowledge will perhaps think the earlier work shows more weakness than devotion. There is room for all. There is art to every man's taste; and if ever the public could be brought to understand what the criticism of the day really is, it would speedily become extinct—a consummation devoutly to be wished. The student should carefully study those works which are easily accessible. First of all the "cartoons"; for though little of the actual execution can be attributed to Raphael, the composition is undoubtedly his. The expression of the faces, the action of the figures, combine to tell the story in a way that is at once effective, dramatic, and simple. They are large, manly, free, decorative works, the execution is what in these days would be called "Academic"—in other words, it is the straightforward work of men who knew their business and did it. If they had stopped to talk, or even to think, of half the nonsensical refinements that critics now pretend to see in their work, they would never have got through the job; for the drawings had to be done in a given time for the tapestry weavers to work from. Incomparably the finest part of the cartoons is the heads of the Apostles in the *Charge to Peter*. These are painted with all the care bestowed on an easel picture, and are probably by Raphael himself. If the nude is sometimes treated in the grandest manner, as in *The Sacrifice at Lystra*, it is at other times positively bad, as in the arm of the cripple at *The Beautiful Gate*. The feet are generally good, the hands as generally indifferent. The draperies are finely cast, and, for the purpose for which they were wanted, magnificently painted. I have reason to suspect that the present state of the cartoons suggests a finer quality of colour than they really had when new.

Ypres.

G. E. STREET.

I reached Ypres in time to spend the afternoon in sketching and studying what is perhaps the noblest example of the Domestic work of Germany. Les Halles, as this great pile of building is called, seems to have been a great covered mart rather than a mere town-hall; and when I was there a fair was being held within its walls, and, filled with picturesque groups of people, and stalls for the sale of every conceivable kind of merchandise, the grandeur of its size and design was well seen. The main portion of the building is of uniform early Middle-Pointed date, and forms an immense and rather irregular parallelogram, enclosing some long and narrow courts. The principal front towards the market-place is, by a rough measurement which I made, about 375 feet in length, very uniform in its design, but broken in the centre by a fine lofty engaged tower, surmounted with a spire, finishing in a sort of louvre of modern character. The whole effect of the building is incon-

ceivably grand, leaving behind it in point of general effect even (I am bold in saying it) the Ducal Palace at Venice. In elevation the main building is divided into three stages. The ground stage consists of a succession of openings with square heads, trefoiled; the next of a long series of two-light windows with quatrefoils in the head, the openings in which are square, the tracery not being pierced; and the third stage has again an immense succession of traceried openings alternately glazed and blank. The whole is surmounted by a lofty traceried parapet corbelled out, and the steep (and original timber) roof is surmounted with a ridge-crest of stone, of more delicate character than I have ever seen elsewhere. The front is finished at the angles with immense octangular pinnacles, corbelling out at their base from the wall, and the tower, which rises two stages above the ridge of the roof, has also at its angles similar pinnacles. The general *motif* of the entire front is continued happily in the steeple, the faces of which are occupied with rows of lofty windows of two lights. From the belfry, and from within another corbelled parapet, springs the spire, which, at first square, becomes below the tourelle on its summit an octagon. Immediately behind Les Halles stands the cathedral. This has a fine western tower, built cir. A.D. 1380, and remarkable for the triple buttresses at its angles. The west door is double, and set within an enclosing arch with the west window, in a common German fashion. The interior is lofty and spacious, with cylindrical shafts, whose capitals have simple foliage of the thirteenth century. The triforium is good, and some of the clerestory (*e.g.* that in the south transept) is also early and good; but the whole church is not by any means of the first order. The south transept has recently been very creditably restored, the new carving being executed with much spirit. The east end is remarkable externally for its tall buttresses, without weatherings, and for the deep arches under which the windows are set, and which give the building too much of a skeleton effect to be pleasing. A rather graceful turret (of Renaissance character) surmounts the crossing. The cathedral and Les Halles, though close together, are not absolutely parallel, but the combination of the two buildings, with their towers and turrets, and two other towers, is very good, and gives an imposing effect to the general views of the old city. It is to be observed that though in Les Halles the pointed arch and the very best window-tracery are everywhere used, there is no possibility of mistaking it for a church, or even for a religious building. There are many old houses in the town, generally of the sixteenth century, with stepped gables, and four-centred window-heads with carved tympana; but their effect generally is not satisfactory.

## Italian Gothic Doorways.

R. WILLIS.

The Italian enriched doorways appear to me to be by far the best specimens of their Middle Age work, and they are fortunately extremely well preserved. Every other part of the building is liable to transformation, and frequently suffers more or less from the intrusion of new ornaments or the destruction of old. The interiors especially may be found with every gradation of change, from the mere alteration of a few capitals to the complete mask of plasterwork which transforms the Gothic cathedral into the pseudo-classical hall. Even the windows may have their tracery removed, but the doorways seem to have been always respected, and allowed to remain; even when the original building has been taken down from behind them and an entirely new one erected. The same fortune has always attended doorways. How often, for example, the Norman doorway is found encrusted in the Early English façade of our own country. The complete doorway of the Middle Ages may be considered as composed of three distinct parts. A *door-archway* occupies the thickness of the wall, and is richly decorated, being generally a compound archway of many orders and various decorations. Within this is the doorway properly so called, which is seldom of the same height or figure as the archway, while the space between them is decorated with figures or emblems, alluding to the purpose for which the building is destined, the saint to which it is dedicated, and so on; or else may be filled with tracery. The whole of this may be termed the *doorway-plane*. Beside these the external face of the wall about the archway is generally occupied with some canopy, porch, roof, or other ornaments, which may be termed the *extramural decoration*. The complete doorway, therefore, is made up of the doorway-plane, door-archway, and extramural decoration.

## The Atrium in Roman Houses.

W. RAMSAY.

This for a long period was the most important apartment in a Roman house. It was generally more spacious than any other, and existed in some shape in every mansion, great or small, from the earliest down to the latest times. It was always placed opposite to the principal entrance, and was in the great majority of cases lighted by an aperture in the centre



of the ceiling, open to the sky, which was called *impluvium*, because the surrounding roof sloped towards it so as to conduct the rain down into a reservoir called *compluvium*, formed in the pavement below for its reception. The atrium was originally the public room, open to all members of the family, to friends, and to visitors. In the middle was placed the fireplace of the house (*focus*), where all culinary operations were conducted, the smoke escaping through the impluvium above; beside the focus a small altar was erected, upon which were placed the offerings to the domestic gods, the Lares and Penates, who occupied niches hard by, and the focus being the spot farthest removed from the exterior of the mansion, the space which it occupied was sometimes termed *penetralia* or *foci penetrales*. In the atrium stood the marriage couch (*lectus genialis*), immediately opposite to the door, and hence it was sometimes distinguished as *lectus adversus*. Here, too, all the members of the household shared the common repast; here stood the looms; here the mistress plied her labours surrounded by her maidens; here the master received his visitors; here, when a death occurred, the corpse was laid out previous to the funeral, with feet towards the outer door; and here were arranged the waxen images of illustrious ancestors, in which Nobles took such pride. This description must be understood to apply, in so far as persons belonging to the higher ranks were concerned, to the primitive ages only, when the atrium was the sole public apartment. In process of time separate rooms for cooking, for banqueting, and for carrying on ordinary domestic toils were constructed, a private chapel was provided for the gods, and in the houses of the great the atrium was set apart for the reception of clients and of those who sought assistance from, or desired to testify their respect for, the lord of the mansion.

#### The Conditions of Progress.

J. FERGUSSON.

What is wanted to insure progress towards perfection is, first, that we shall have a public with feeling enough for the art to desire it, and with knowledge sufficient to judge of what is good and beautiful; a body of architects so intelligent as to be able to grasp the condition of the problem, and with taste enough to design the requisite forms of expression; a class of builders with skill to arrange and energy to carry out what has been so designed; and, more perhaps than any of these, a class of art workmen so instructed and so expert that they shall be able to understand the work they have in hand, and so skilled as to be able to execute it thoughtfully and well. Many of these elements we already possess, and are progressing towards the attainment of the rest. But even all these will be of no avail unless every class is thoroughly imbued with a conviction that architecture is neither more nor less than a true and progressive development of a useful art into a fine art, but which can never throw off its connection with its parent, nor can ever be practised on any other principles than those which alone have led to the elaboration of other useful arts into their æsthetic developments. In addition to this, it is indispensable that the public mind should be thoroughly disabused of the idea that archæology is architecture, or has, in fact, any direct connection with it. It never was so when art was a living thing, and there is no logical reason why it should be so now. Once this error is exploded, and we really set in earnest to elaborate building with truth into architecture, there seems no reason why we should not surpass all that has been done up to this time. We have more wealth, more mechanical skill, more refinement than any nation, except perhaps the Greeks, and taste (even if not innate) may result from the immense extent of our knowledge.

#### Tarquinius Mural Paintings.

E. BRAUN.

In a room of the Lateran Museum, entered by a narrow passage from the bronze gallery, are placed copies of the mural pictures discovered in the Necropolis of Tarquinii between the years 1827 and 1831. These, notwithstanding their deficiencies as works of art, are important for such persons as wish to make themselves acquainted with the principles of the pictorial stylisation of the ancients. We here find a remarkable phenomenon, the colours employed to give animation to the figures and other objects being restricted within very narrow limits. The four principal colours of the prismatic spectrum have been made the foundation; and wherever a varied play of colour is developed in the actual object the general impression has been reduced to certain chromatic formulae, which at first sight awaken our wonderment. When we see blue ducks, nay, light-blue horses, we look upon it as not only unnatural, but even in direct opposition to Nature. On a closer examination of such a scale of colours we discover, however, that their treatment rests upon analogies recognised also in the language of poetry, and that by this strict limitation an end is achieved resembling that exhibited in the stylising of the forms of plants intimately connected with architecture, or even completely blended together, as in the ornamentation of a Corinthian capital. Hence in these paintings we see green leaves, grey

fowls, light-coloured horses, and glittering metals all given without distinction as light blue. In a similar manner, we find the three other colours substituted for the natural ones, the treatment of the outlines likewise corresponding to this conventional style of painting, its antiquated stiffness being by no means founded on artistic incapacity, but resulting from the positive intention of treating these mural decorations as an integrant part of the architectural surroundings, and therefore in a manner strictly conformable with these. The play of lines exhibited in the varied attitudes and artificial arrangement of the figures is, therefore, very limited, and subjected to metrical laws in the same manner as the language of the poet, which is likewise measured in its expressions, and in reference to the thought frequently very restricted. Would we analyse and pass judgment, according to scientific principles, upon the works of modern art undertaken in a kindred spirit, we should necessarily have to fall back upon these oldest attempts at pictorial stylisation, and, by the help of comparison between corresponding phenomena, endeavour to discover the laws to which alone such productions are subjected. These representations relate to banquets, festal dances, public games, and burials. In some the Etruscan physiognomy is strongly marked; in others it appears more softened. It is the same type still to be seen in the inhabitants of Corneto, a town known to be situated in the neighbourhood of the ancient Tarquinii. These pictures differ in this respect in a very remarkable manner from the greater part of the vase-paintings in which the Greek ideal prevails, although both lines of art are governed by precisely the same principle.

#### The School of the Carracci.

R. N. WORNUM.

Lodovico Carracci, the founder of the eclectic school of Bologna, was born at Bologna, April 21, 1555. He was placed with Prospero Fontana; and while in his school his apprehension appeared to be so slow that, like Domenichino afterwards, he was called by his companions the ox, *il bue*. He afterwards entered the school of Passignano at Florence, and studied the works of Correggio and Parmigiano at Parma, those of Giulio Romano at Mantua, and those of Titian at Venice. The works of these and other masters afforded the elements of the eclectic style of the Carracci, as expressed in the well-known sonnet of Agostino:—"Let him who wishes to be a good painter acquire the design of Rome, Venetian action and Venetian management of shade, the dignified colour of Lombardy, the terrible manner of Michel Angelo, Titian's truth and nature, the sovereign purity of Correggio's style, and the just symmetry of a Raphael; the decorum and well-grounded study of Tibaldi, the invention of the learned Primaticcio, and a little of Parmigiano's grace; but, without so much study and toil, let him only apply himself to imitate the works which our Niccolino has left us here." The last sentence, which is a mere compliment, refers to Niccolò del Abbate. This sonnet sufficiently explains the principles of the eclectic school, and, at the same time, shows their mere technical tendency. The school of the Carracci was opened in 1589, and carried on by the cousins conjointly up to 1600, from which time it was conducted by Lodovico alone until his death (December 13, 1619), which is said to have been considerably hastened by some errors in the fresco of the Annunciation in the cathedral of Bologna, his last work. The frescoes of the convent of San Michele in Bosco, from the life of St. Benedict, commenced in 1602, after Lodovico's short visit to Rome, and which were generally considered his masterpieces, have long since perished, though the designs are preserved in the prints of G. M. Giovannini, "Il claustrum di San Michele in Bosco di Bologna, &c.," published in 1694, with descriptions by Malvasia. There are thirteen pictures by Lodovico Carracci in the gallery of the Academy at Bologna, including some of his most celebrated works in oil. In the opinion of Sir Joshua Reynolds, no painter knew how to harmonise the treatment of a picture with its subject better than Lodovico Carracci. "Style in painting," says Sir Joshua, "is the same as in writing, a power over materials, whether words or colours, by which conceptions or sentiments are conveyed. And in this Lodovico Carracci, I mean in his best works, appears to me to approach the nearest to perfection. His unaffected breadth of light and shadow, the simplicity of colouring, which, holding its proper rank, does not draw aside the least part of the attention from the subject, and the solemn effect of that twilight which seems diffused over his pictures, appear to me to correspond with grave and dignified subjects better than the more artificial brilliancy of sunshine which enlightens the pictures of Titian." The scholars of the Carracci produced a change in all the schools of Italy; but the qualities of their works, in contradistinction to those of the great masters of the preceding century, are strictly technical or material. They remained as much below the great masters of Rome and Florence in expression, composition, and character, as they surpassed them in general execution. The most distinguished masters of this school were Domenichino, Guido, Albani, and Lanfranco.







The Archipel. Sept. 14<sup>th</sup> 1888.







"INK PHOTO," SPRAGUE & CO., 22, MARTINS LANE, CANNON ST., LONDON, E.C.

HOUSE AT HEATON,  
for D<sup>r</sup> G W GRABHAM.

W. H. HERBERT MARTEN, } Architects  
& J. ELLIS MARTEN, }



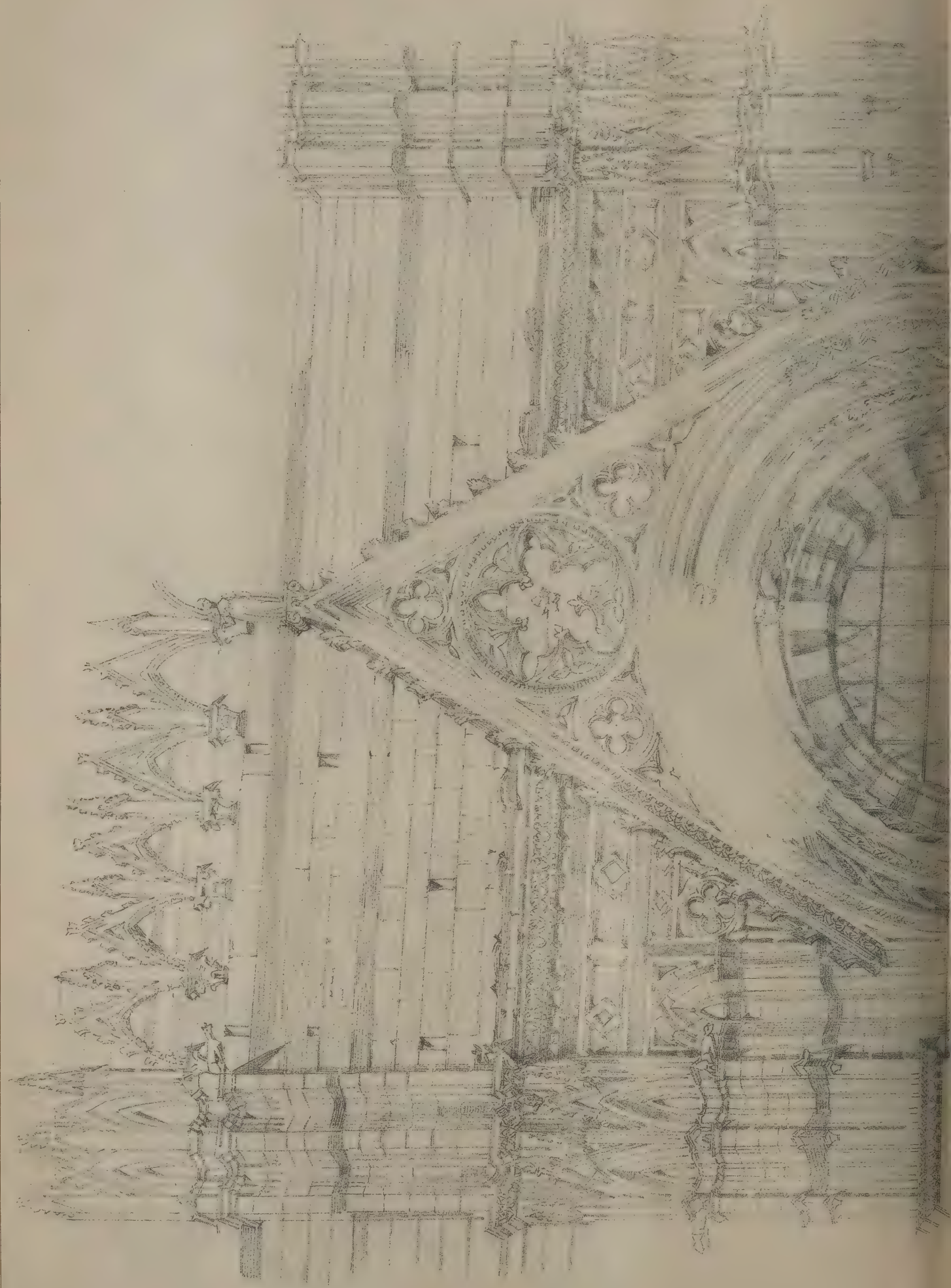








The Architect, Sept<sup>r</sup> 14<sup>th</sup> 1888.







SIENA, DOOR TO BAPTISTRY.  
From a Drawing by G. C. HORSLEY

Sienna  
Door to Baptistry  
Apr 25 1881

See also p. 74, where the Baptistery is shown in plan. Also p. 110-112

See also p. 110-112, where the Baptistery is shown in plan. Also p. 110-112







The Architect, Sept<sup>r</sup> 14<sup>th</sup> 1888.

Cleeve Abbey Som<sup>r</sup>.  
Exterior of the Refectory.

CEN 2, II-3-37.

"INK-PHOTO" SPRAGUE & CO. 22, MARTINS LANE, CANNON ST, LONDON, E.C.

EXTERIOR OF THE REFECTORY, CLEEVE ABBEY, SOMERSETSHIRE.  
From a Drawing by C. E. MALLOWS.







## ILLUSTRATIONS.

## HOUSE AT HEATON.

THIS house, of which we illustrate the entrance front, is in course of erection for Dr. G. W. GRABHAM, and occupies an elevated site overlooking the reservoir and Manningham Park, beyond which a distant view of Bradford is obtained. It contains in the basement a large billiard-room, wash-kitchen, larder, wine and coal cellars; on the ground floor the porch gives access to a cosy little hall with fireplace, from which on the left are arranged lavatory, butter-pantry, store-room, kitchen, and scullery, with back staircase adjoining; on the right are three reception-rooms and conservatory communicating; recessed fireplaces are planned, and will be seen in a view from the south-east, of which we propose to give an illustration. The principal staircase leads to four bedrooms, bath-room, water-closet, lavatory, linen-room, and housemaid's closet on the first floor; two bedrooms and cistern-room are provided on the second floor, reached by the back staircase. The materials used are self-faced wallstones to the plinth, hammer-dressed above, with ashlar to window jambs, &c., and the whole of the porch. The roofs are to be covered with red tiles, and the interior woodwork is to be of the best selected pitch pine. The mason's work is being carried out in a most substantial manner by Mr. HENRY HUSTLER, of Bradford, under the superintendence of Messrs. H. & E. MARTEN.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 18.—SIENA, DOOR TO BAPTISTERY. [G. C. HORSLEY.]

NO. 19.—INTERIOR OF REFECTION, CLEEVE ABBEY, SOMERSET-SHIRE. [C. E. MALLOWS.]

NO. 20.—EXTERIOR OF REFECTION, CLEEVE ABBEY, SOMERSET-SHIRE. [C. E. MALLOWS.]

## RESTORATION OR DESTRUCTION?

THE church in the village of Cossey, Norfolk, has given rise to much correspondence, from which the following is extracted:—

Dr. Jessopp lately received a request by post to contribute towards the "restoration" of Cossey Church. Knowing nothing of what had been going on, he writes, I at once drove over to survey the ground, and was overcome by dismay. I remembered but imperfectly a beautifully proportioned structure, for the most part of early fourteenth-century workmanship, consisting of a nave, with windows still retaining large portions of the old stone mullions and tracery, the roof in a rickety condition, the seating shabby, ugly, and inconvenient. There was a superb screen separating this nave from the chancel, and I found chancel and screen pretty much as I had seen them some years ago. Of the ancient nave its walls alone remain. Every record of the past, every vestige of anything that could suggest a reminiscence of that past, every faint hint that the life and faith of that past had any link of connection with the present, has been brutally obliterated. Everything of beauty has been swept away. The old stone mullions of the fourteenth-century windows have been torn out, the very jambs hacked away; there they lie in a heap outside, doomed sooner or later to be utilised for the "restoration" of a pigsty or the construction of a silo. In their place there are not honest sashes with weights and cords, but constructions of white brick, the ingenious moulders having set themselves to present the beholders with a fancy portrait of the ancient tracery and cusping in cooked clay. There stands that astounding structure,

One more triumph for devils, and sorrow for angels,  
One wrong more to man, one more insult to God!

All this was past remedy; but that screen and the chancel behind it remained intact a fortnight ago. There were in the chancel five windows of rare ingenuity and beauty of design, containing considerable fragments of brilliant stained glass—the stonework in remarkably good preservation—one of the windows in the north wall presenting some characteristic features which, as far as I know, were unique. The roof was a trussed rafter roof of the early part of the fourteenth century, the moulding of the wall plate being exceedingly rich, and doubtless designed and executed by local craftsmen, the rude forefathers of the hamlet, whom we take such special pains to help their posterity to pity and despise. The screen was thickly covered with white paint, yet not so thickly as quite to hide the exquisite carving of the spandrels, bearing upon its

every line the evidence that a born artist had there given play to his genius and worked at it as a labour of love. To "restore" this chancel I had been asked to subscribe from my scanty means—to restore, mind, not preserve; and when I asked what was intended in this case by the term "restoration," I was proudly told that it had been agreed by a large majority of the parishioners to substitute for those chancel windows others of a more sightly and convenient pattern, to harmonise with the triumphs of brickwork in the nave. As for the screen, nobody wanted it; it was to be got rid of somehow; my informant did not quite know how. When I asked where the money was to come from, I was told confidently that the trustees of the great hospital had voted 250*l.* towards the completion of the work.

Next week a representative of the Society for the Protection of Ancient Buildings was sent down to report upon the condition of affairs, and a very temperate letter was addressed to the trustees, and a representation was made to the archdeacon to the effect that no faculty ought to be granted to any one to meddle with the chancel without due notice, and without giving opportunity to those whom it concerned to enter objections to any plans that might be presented. But the money had been voted and the Vandals were not disposed to lose time. They applied, it seems, last week for their faculty—(1) for replacing the windows with others "of a similar character"; (2) for removing the present roof and substituting another similar to the nave; (3) for replastering walls and general repairs. Not a word about the screen.

The surveyor for the county of Norfolk happens to be an inhabitant of Cossey; he gave notice of his intention to oppose the granting of this faculty, and was waiting quietly for the day appointed, when, lo! on Monday, August 27, a contracting bricklayer with half a dozen labourers appeared on the scene, and forthwith the work of demolition began in earnest. Before the day was done the roof was more than half stripped off, the unique window in the north had been taken out bodily, and almost all the old stained glass destroyed. Meanwhile I understand no faculty has been granted—that is, no authority has been given for this outrageous demolition. The Vandals laugh at faculties. Why should they not laugh? They have won the day.

An answer to the foregoing appears in the *Times* of Wednesday from Mr. Gunter and Mr. Brett, churchwardens of Cossey, who write:—We distinctly say that not only has Dr. Jessopp been misled by his informant, but also by his own recollection of this church, which he acknowledges to be but imperfect. Dr. Jessopp says he remembers seeing the nave windows still retaining large portions of the old stone mullions and tracery. This is not true; no record exists in the parish of the removal of this tracery, neither has the oldest inhabitant any recollection of it; but it was entirely removed, and square-headed wood frames inserted. The upper portion above these frames was filled up with brickwork and plastered over. Small portions of the old jambs and mullions, repaired to a considerable extent with cement, existed until the present work was commenced. When these wood frames were removed, and the brickwork taken away from the arches, several pieces of the old tracery were found, having been broken up and used to fill up the space above the frames. This fact must have been known to Dr. Jessopp's informant, and, in justice to those who are responsible for the work, ought not to have been withheld. Dr. Jessopp says there were in the chancel "five windows of rare ingenuity and beauty of design, containing considerable fragments of brilliant stained glass." There were four old windows in the chancel. The east window was inserted by the present vicar, and is but twenty-five years old. Stained glass existed in two of these windows only. One of them has been removed, and the glass not destroyed, as Dr. Jessopp says, but carefully preserved at the Vicarage. The whole of the stained glass in both windows, carefully measured, does not give two superficial feet, and this is called by Dr. Jessopp "considerable." Now for its brilliancy. Since his letter appeared in your issue of the 3rd inst., it has been copied into the local papers, and has been read by many residents. We are asked every day, "Where was this beautiful glass?" I have attended the church all my life and never saw it." This is a fact—that persons who have resided in the village all their lives had never observed this "brilliant" glass. Our church was in a wretched state; we received frequent complaints of the water coming through the roof; the damp and the cold draughts of air made it impossible for persons in delicate health to attend the church in winter, and the attendance in consequence was meagre in the extreme. We appealed successfully to the public, and found ourselves with 600*l.* Archaeologists had not troubled us in the past; but now we had money to spend we were besieged with advice, and had we followed all of it our church would now be a miserable jumble of fads and crotchets.

Mr. R. Herbert Carpenter, F.S.A., writes:—Some little time back there was made to the Incorporated Church Building Society an application, accompanied by plans, for a grant of money in aid of the so-called "restoration" of the church



When, in due course, these plans came before the honorary committee of architects advising the Society, they regarded the proposals set forth in the plans with absolute horror, and protested against them. Afterwards, on certain information and photographs being at their request sent to them, Mr. Ewan Christian studied them with me, and he formed so strong an opinion against the work proposed, and in favour of the possibility of preserving so very interesting a church, that he determined to visit it and see it for himself. At another interview Mr. Christian expressed to me his great satisfaction in having ascertained that the opinion he had formed was a correct one, and that he was convinced that by careful and conservative repairs, not only might the ancient windows (now replaced by the ready-made terra-cotta ones proposed in the plans!) be retained, but that the design, and probably also some of the old oak timber of the nave roof, might be preserved. He was strongly of opinion also that a certain local peculiarity in the arrangement of the seats was ancient; but it is, perhaps, in vain to hope that this is to remain unaltered. Mr. Christian is now away from town, but I feel sure that I am expressing his views on the subject, and that he would join in protesting with all his might against the havoc which has been wrought. Such a system of "restoration" we must all of us feel discredits the term used to describe it; and as antiquarians we know that it is in every way antagonistic to the principles laid down in the "Paper of Suggestions" which the Council of the Royal Institute of British Architects have (with the aid of Mr. Pearson, R.A., and Mr. Blomfield, A.R.A.) revised and re-issued to its members, as well as to those concerned in works of church restoration. I may add that the chancel work was not, I think, contemplated by the plans submitted, but its destruction is even more, if possible, to be regretted than that of the less perfect nave. I remember some few years back sketching its remarkable and very beautiful windows, unlike, in some respects, any others I had seen.

A letter has also been published from the Society of Antiquaries, with a lengthy addendum in the shape of what Lord Grimthorpe calls "the Antiquaries' Encyclical on Restoration." Lord Grimthorpe's contribution to the controversy appears in another column.

#### PRESERVATION OF ANCIENT MONUMENTS.

AT the meeting of the British Association in Bath, Lieut.-General Pitt-Rivers, the president of the Anthropological Section, in the course of his address drew attention to the working of the Act for the Preservation of Ancient Monuments, with the carrying out of which he had been entrusted during the last five years. No owner, he said, except one, has voluntarily offered any monument to be put under the Act; all have had to be sought out and asked to accept the Act, and of the owners of scheduled monuments the larger number have refused. Sir John Lubbock was chiefly instrumental in passing the Bill through Parliament, although in the condition in which it actually passed it was not his Bill. He had proposed to make the Act compulsory in the case of some of the more important monuments, but the proposal had been overruled on the ground of its being an improper interference with private ownership. Sir John Lubbock, finding that the Act in its improved stage was purely permissive, and not believing that anyone would voluntarily make use of it, at first refused to include his own monuments, and it was only after I had obtained others, and success appeared probable, that he consented to put Silbury Hill under the Act. The accompanying map of Great Britain shows the monuments that I have been the means of obtaining by the consent of their owners. Having named these and given some particulars of each, the author continued. It speaks well for the landowners that so many should have been willing to accept the Act, considering that few of them take much interest in antiquities. There is not a more public-spirited body in the world than the much-abused landowners of England. Those who have refused have generally done so on the ground that they wish to remain responsible for their own monuments, and there is very little damage to prehistoric monuments going on at the present time. Public opinion has done more than any Act of Parliament could do, and it is generally known throughout the country that any wilful damage to the monuments would be universally condemned. The Government are made responsible for all the monuments that are included, which entails expense, and as members of Parliament generally take very little interest in ancient monuments, and the great object of Government must always be to curtail expenditure, additions to the list are not as a rule encouraged. I last year obtained eleven new monuments, but I was told that this was too many and that some must be omitted, so I omitted three of the least important. At present local archaeologists wash their hands of the matter, thinking that there is a Government inspector whose business it is to look after the monuments. This is a mistake; the proper function of the inspector is simply to

look after the monuments that are included, and to advise the Commissioners—not to obtain new monuments for the Act. You cannot insure always having a landowner for an inspector, and it is desirable now to put the Act on a working footing. It is much to be wished that local archaeological societies should be made to feel themselves responsible both for the inclusion of monuments under the Act, and their preservation afterwards; the Act arms them with full powers for the purpose if they think proper to use it. At present no archaeological society has rendered any assistance whatever, but Sir Herbert Maxwell, in Galloway, has not only offered his own monuments, he has persuaded his neighbours to do the same. What Sir Herbert Maxwell can do others equally public-spirited can do also. It should rest with them, because, being local, they can do more than a single inspector charged with the supervision of the whole of the monuments of Great Britain. The Government should continue to appropriate a small sum (it is now under 200*l.* a year) to apply to such purposes as may be thought desirable, such as building sheds to preserve the monuments, but they should not necessarily be held responsible for all the monuments placed under the Act, and the Bill, being a permissive one, it should rest with the public to make use of it or not, as they may think proper. As long as the owner of a monument takes an interest in it, he is the best person that the public can look to for the preservation of it.

#### PERMANENCY OF WATER-COLOURS.

A PAPER on "The Action of Light on Water-colours" was read by Dr. Arthur Richardson, at the meeting of the British Association. In it he discussed the effect of light on colours, and drew attention to the very important part played by moisture in assisting their decomposition. Colours were divided into two groups:—(1) Those which bleached by oxidation under the combined influence of light, air, and moisture; (2) those on which light exerted a reducing action, which was independent of the air, and in some cases took place in the absence of moisture. Cadmium yellow, cadmium orange, king's yellow, and indigo were placed in the first group; these were shown to bleach by light, under the conditions above stated, but were permanent in an atmosphere of carbon dioxide, or in dry air. The colours of the second group included Prussian blue, vermilion, lakes, gamboge, &c. Prussian blue faded in moist air—much more readily, however, in an atmosphere of carbon dioxide; but it was permanent in dry air. Mixed with cadmium yellow, Prussian blue gave a green which was very sensitive to light if moisture was present; permanent, however, in dry air. Vermilion was shown to fade in dry and moist air; also in an inert atmosphere like carbon dioxide. With cadmium yellow an orange was formed which blackened in moist air in a few hours, though in dry air light was without action on it. He condemned as unsafe those pigments which faded in dry air, and showed that the greater number of paints were stable in sunlight, provided moisture was absent.

#### DUNFERMLINE ABBEY.\*

THE historical accounts of many parts of Scotland previous to the twelfth century, the author said, were made up in a great measure of tradition and fable, and in that respect Dunfermline and its vicinity were no exceptions. As to the name of the town, a number of conjectures had been made. It was, however, now generally agreed that the name was derived from the castle of King Malcolm Canmore, a fragment of which building was still to be seen upon the steep ground known as Towerhill, in the policies of the estate of Pittencreeff in the immediate vicinity of the abbey and palace. The etymology usually adopted of the word Dunfermline was the Gaelic *Dun-fear-linne*—the castle by the crooked stream—though many other renderings had been suggested. The tower or castle which that name referred to, appeared, from measurement of the remaining walls and the foundations, to have occupied the greater part of the top of the eminence. It was thought to have been a square tower, or keep, of two storeys, with a high roof, and presenting an appearance in its principal part very much as was shown in the arms of the burgh as now blazoned. That castle was the residence of King Malcolm when he received and hospitably entertained the Princess Margaret of England, who, with her relatives and retinue, were driven by stress of weather into the Firth of Forth on their passage to the Continent, after the conquest of England by William. Mr. Freeman, however, in his "Norman Conquest," stated that after the defeat of Edgar Atheling by the Conqueror near York, Edgar with his sister Margaret and their retinue, went to

\* From a paper read by Mr. George Robertson, F.S.A. Scot., on "The History of Dunfermline Abbey and Palace," on the occasion of the visit of the members of the British Archaeological Association.



Monkswearmouth, where Malcolm, King of Scotland, was then with his army. Malcolm had an interview with Edgar, and, hearing of his hopeless condition, advised him to sail immediately for Scotland and take up his residence with him in Dunfermline. The advice was taken, and the illustrious exiles set sail for Scotland in the month of October 1069. The place of their disembarkation was to the west of Queensferry, in that part of the Firth known as St. Margaret's Hope. It was supposed that they landed at the promontory on the north side, now occupied by the Castle of Rosyth—anciently Resythe—which name might probably be derived from "Res-hythe" or Queen's landing-place. That castle and St. Margaret's Hope could be seen from the abbey, from which they were about four miles distant. In the year 1070 the nuptials of Malcolm and Margaret took place, as recorded by Fordun, not far from the bay of the sea where she landed, and were magnificently celebrated at a place called Dunfermline, which the king then had as his fortified residence. Sir James Balfour, Lord Lyon King-at-Arms, in his "Annales of Scotland," referred to the marriage of the Princess Margaret with King Malcolm as having been "accomplished with grate solemnity at his village and castell of Dunfermelin in the Woodes, in the 14 yeire of his raigne, in Anno 1070." About the year 1075 the Abbey of Dunfermline was founded by King Malcolm, at the suggestion of Queen Margaret. The church was dedicated to the Holy Trinity, and appointed to be the future royal burying-place in room of Iona. The tomb of Queen Margaret—constructed of massive slabs of mountain limestone, in which were many curious fossils—was still to be seen outside the present church, but within the ruined walls of the lady chapel of the old building. The tomb had recently been enclosed by an iron railing by Her Majesty's Board of Works, who were custodians of the abbey and palace. The remains of Queen Margaret were removed from the still older portion of the church to that tomb on the completion of the eastern church in 1250. The Norman church of Queen Margaret—or Saint Margaret, as after her canonisation she was designated—was still in good preservation, having been thoroughly repaired and strengthened by Government some years ago. Its architecture was somewhat rude, but the internal appearance of the building was lofty and the general effect imposing. The eastern portion of the church, which was erected in 1250, was almost totally destroyed at the Reformation, when the Reformers came—

Wi' picks and spades,  
And wi' John Knox into their heads,  
Dinging the Abbeyes doon.

All that now remained of that eastern portion of the church were the small parts of the lady chapel around St. Margaret's tomb. The following was a copy of a warrant for the destruction of the abbey, dated 1560:—

Traist freindis, after maist hearty commendacion, we pray you fail not to pass incontinent to the Kyrk of . . . and tak down the hail images thereof, and bring furth to the Kirk-zayrd, and burn them oppinly. And siclyk cast down the alteris, and purge the Kyrk of oll Kynd of monuments of idolatrye. And this see fail not to do, as ye will do us singulare empleaseyr, and so committis you to the protection of God. Fail not bot se tak guid heyd that neither the dasks, windocks nor durris be ony ways hurt or broken, either glassin-wark or iron-wark. Fro Edinburgh . . . 1560.

(Signed) AR. ARGYLE.  
JAMES STEWART.  
RUTHVEN.

The work of destroying Dunfermline Abbey commenced on March 28, 1560. The tomb of King Robert Bruce was immediately below the pulpit of the present new church, but there was nothing to mark its place but the large stone lettering on the parapet of the lantern tower immediately above the spot where he lay. The architecture of the oldest part of the church was very interesting as an example of the earlier Norman, the west doorway in particular being well worthy of notice. The present steepled tower had been erected upon part of an earlier tower, probably about A.D. 1440, which date was to a certain extent indicated both by the architecture and by an heraldic shield which was cut out on a boss in the vaulting of an adjoining bay of the same architecture. That shield bore the arms of Abbot Bothuel, or Bothwell, who was Superior of the abbey at that time. The pointed arches and clustered columns at the same part also lend testimony to that idea of date. Queen Margaret's arms—those of Edward the Confessor, her granduncle, being a cross fleury between five martlets—were also cut on a boss in the vaulting of the adjoining bay. For many years there had existed an erroneous idea that the steeple, the north porch and the bays referred to were erected by James VI., but that idea had of recent years been abandoned by many who had made a close study of the architectural and heraldic features. The south tower was modern, having been erected early in the present century, to replace a Norman tower which fell in 1807. The buttresses on the north and south sides of the church were of much later date than the original building; one of these—on

the south—bearing the date of 1620, and another—on the north—that of 1675. Those buttresses had evidently been much needed to strengthen the walls, which still in some places showed a slight inclination from the perpendicular. Many later works and repairs were carried out by William Schaw, who was architect to James VI., and to whose memory and honour a monument was erected by Queen Anne in the north aisle, but now stood at the base of the steeple tower. On the monument was an interesting square of marble, with the monogram "William Schaw" in interlaced letters. It was said that this monogram had been cut by Schaw himself, and was inserted in his monument by Royal command. The long inscription on the front of the monument was in Latin, and bore testimony to his worth and abilities. He was therein styled "Master of the King's Work, Sacrist, and the Queen's Chamberlain." At the east end of the north aisle was a monument to Robert Pitcairn, Secretary of State, who died in 1584. To better show a modern stained-glass window, the upper part of that monument had, in questionable taste, been removed, and now stood within the western doorway. Both that monument and that of Schaw were ornamented at the upper sides by the scrolls known as "Scottish." At the east end of the church the Norman pillars were incised by spirals and chevrons, or zigzags similar to pillars in Peterborough and elsewhere. Before the erection of the church of 1250 the high altar stood between those pillars, the east end of the church being very likely formed by an apse, as in many other churches of similar date. There was nothing left, however, but the ornamented pillars to make that surmise certain. After the Reformation, gallery seats or "lofts" were erected between the pillars. The carved front of the Royal pew, with the date of 1610, which was between two of those pillars, was still preserved in the north transept of the new church. The side panels of it, bearing names of illustrious persons buried in the church, were modern, and were placed there in a great measure to fill up the wall space. This old piece of woodwork was a very good specimen of the woodcarver's art at the time of its erection. Other gallery pews—principally those of the nobility and the incorporations of trades—were erected between the pillars of the old church, but that front of the Royal pew was all that now remained.

Many of the windows of the old church had of recent years been filled with coloured glass designs. In the south aisle there was a much-admired window to Annabella Drummond, Queen of Robert III., and mother of the murdered Duke of Rothesay. It was erected by Lady Willoughby d'Eresby to the memory of her royal ancestor. The large window in the west wall had also recently been filled with historical glass, at the cost of Mr. Andrew Carnegie of New York, who was a native of Dunfermline. The design of that window was by Sir Noel Paton, who was also a native of the town. The design embraced figures of King Malcolm, Queen Margaret, King Robert Bruce, and William Wallace, with appropriate accessories and heraldry.

The monastery was situated to the south of the church, the only remaining portion being the south and west walls of the refectory or Frater's hall. In the west wall was a large and handsome window, seemingly of fourteenth-century work. In the centre of the head-lights there was a peculiar figure, somewhat resembling a heart, a crown or a monogram, but no satisfactory explanation of its true meaning had yet been arrived at. At that point there was a connection between the monastery and the palace, in the form of a massive pended tower, underneath which the public road now passed. The ground to the north of that "pend" was the palace yard—a large open space between the abbey and the palace, and upon which both fronted. At the north side of that yard there was another pended tower, in which was the north gate of the palace. Very little now remained of the palace but the west wall, built upon a steep slope, at the bottom of which was the water of Lyne or "Tower-burn." From the portions of the palace that remained, it could be seen that many alterations had from time to time taken place in its structure. The windows in particular had undergone a great change. They were originally Gothic, and of very wide dimensions, but had been altered to square or Tudor. In the soffit or ceiling of one of the upper windows there was a large sculptured stone bearing a representation of the Annunciation. That carving was supposed to have formed part of an altar in the Abbey, or the tympanum of an arched door or window, and to have been removed to its present position at the Reformation. When discovered in its present position it had been plastered over, as if for concealment. Charles I. was born in this palace in 1600. The room generally pointed out as the place of the birth of Charles was that of the Annunciation Stone, but he was much of opinion that it was a room in the same storey at the west, or newer, part of the building. The kitchen of the palace was a large unroofed apartment, and had two spacious fireplaces. The iron cooking grate or range of one of these was now in Her Majesty's Office of Works, Edinburgh. A communicating passage through the pended tower, and a wheel stair, led from



the monastery to the kitchen—the brethren having a right of certain supplies from the latter place. Underneath the kitchen there was a large vaulted room, locally known as the “magazine,” from the fact of its having been used during the civil wars as a store for ammunition. It had the appearance of a chapel or crypt, and from its architecture had evidently formed originally part of the monastery, and not of the palace. At the north-east corner of that vaulted room was the entrance to a dark passage, which appeared to have been an underground communication between the monastery and the church. On a recent exploration it was found that the passage led in that direction, but about 90 feet from the entrance it was found to be built up. It seemed quite likely that, although at one time a thoroughfare for the brethren, it had been broken at the upper end by the formation of the public road and other changes. The passage was arched with groins or ribs at intervals, and was over 6 feet in height from the paved floor, though in places, from the accumulation of earth and other matter, it was now much less.

### CURRICULUM FOR ARCHITECTURAL STUDENTS.

**T**HIRTEEN years since the Council of the Manchester Society of Architects issued an address to architectural students of their district, accompanied by a list of books for study and reference. The Council, believing that considerable service was thus rendered to students, have just issued a second address with a revised list of books. A course of study for each year, as drawn up and recommended by the Council, is also given, from which the following is taken:—

*First Year.*—The student should be relieved as much as possible from fixed office work, and should devote about half his time to perfecting himself in mathematics, practical, plane, and solid geometry, and freehand drawing of carefully-selected examples, both from copies and also from the cast. During the time spent in the office he should endeavour to gain as much knowledge as possible of tracing and ordinary office work.

*Second Year.*—The student will, during this year, be required to perform regular duties in the office, and should endeavour to improve himself in copying and tracing drawings, and in simple colouring, such as for plans, &c. Part of the time should be devoted to measuring any building or portion of work and laying down to scale on paper, and, when practicable, to sketching portions of buildings or ornaments, especially from good examples of old work. Freehand drawing, both from copies or from the model or cast should be practised, the best course being to attend the classes at the School of Art. Building construction should be taken up; mechanics, theoretical and practical, also studied; colouring and shading may now be commenced. A knowledge of French and German is very desirable, in fact, almost necessary, and the student would do well to attend a class for the study of one or both of these languages. The history of architecture should be studied. During this year a set of quantities for some building should be obtained and carefully examined, and if access can be had to the original quantity book, it would be well to devote some time to obtaining a knowledge of casting out and abstracting the items.

*Memo.*—The student must not neglect to keep up the studies named in the first year's work, such as mathematics, geometry, &c., it being intended that the work shall be cumulative.

*Third Year.*—The student should now be of such use in the office as to be kept well employed in the ordinary better class office work, such as preparing drawings and details. Building construction should be carefully studied, and with it applied mechanics, strength of materials, strains, &c. If the student can attend a class for modelling in clay, he will find it of the greatest use in connection with his studies of ornamental work. Every opportunity should be taken of inspecting work in progress, and notes made at the building of points not fully understood, which should be inquired into afterwards. Nothing should be allowed to pass without examination, and the explanation being obtained. Careful drawing and artistic colouring should be practised; the history of architecture proceeded with, and the different styles inquired into; every opportunity taken of witnessing any experiments with materials and strengths of same, testing of beams, &c.; the preparing quantities taken up; matters connected with sanitary science studied; and the measuring of land, surveying, and levelling, if practicable, along with some good surveyor, also practised. The student is strongly recommended to sketch as much as possible, a book being constantly carried, and notes of interesting buildings or portions thereof made for reference hereafter.

*Memo.*—Keep up former studies.

*Fourth Year.*—The student must now work steadily during business hours in the office, as he will have duties to perform for his employer which must not be neglected. The evenings and

any other spare time may be occupied in the following studies:—Sanitary science, drainage, plumbing, and the detailed arrangements connected with all matters affecting health. Acoustics, ventilation, heating, nature and strength of materials and strains, with the formulæ for calculating them, composition and resolution of forces, and application of ironwork, shoring, and propping. The more advanced study of architecture should be taken up, and differences in details of styles noted, lectures attended, where practicable, and the sketch-book kept constantly in use. It would be advisable now for the student to obtain a good-sized book and collect cuttings from newspapers on subjects connected with architecture and scientific operations—these to be pasted in for future reference. Also another similar book for pictorial architectural scraps. Every opportunity should be taken of inspecting work in progress, and of examining good buildings, and notes and sketches made. During the holidays a portion or the whole of some building might with advantage be thoroughly measured and sketched, and drawings prepared afterwards. It is assumed that the ordinary office work will now provide sufficient practice in measuring, plotting, &c., so that no difficulty should be experienced in connection with the last paragraph. The student is also recommended to enter for the different competitions for prizes offered by the societies. This will be found good practice, as he will then measure his strength with others.

*Fifth Year.*—This will in all probability be the last year of the student's pupilage, and his work should be of importance to his employer, hence he will have less spare time at his disposal and will have to work harder. Specifications and contracts should be carefully examined, and every opportunity taken of composing them. A clear, concise, and correct method of describing work is very desirable. Perspective and the more advanced study of colouring and styles of decoration should be taken up, and due attention given to original design; professional practice and legal questions affecting building operations inquired into; land surveying and levelling should be undertaken, the work being plotted afterwards. Entire charge of a building under the supervision of his employer (the architect), should, if possible, be obtained. The valuation of materials and work must not be overlooked during this year, and the preparing of estimates of cost. In all probability the attendance at the School of Art, &c., will have been discontinued during the fourth year, but the student should before that time have acquired considerable proficiency in these studies. Some attention should be given to chemistry, electricity, construction of machines, &c., all of which will be found useful.

*Sixth Year.*—The student should now be out of his articles, and he will find it of advantage to pass at least a year in London as an improver in the office of some architect of eminence, during which time he should avail himself of the advantages offered by the Royal Institute and the various libraries, and of the lectures on architecture and scientific subjects which are constantly being given. During this and the next year he should prepare himself for the examination to qualify for the Associateship of the R.I.B.A., which should be the aim of all students in architecture. He is also strongly advised to do as much work as possible himself; this applies not only to drawing but to writing out specifications and preparing quantities; an intimate knowledge of the details of work will thus be obtained which will be found of the greatest value afterwards. Some attention should be given to the following matters, all of which come under the notice of an architect:—Valuation of land and buildings; examination of, and reporting on, dangerous structures; the sanitary condition of buildings; dilapidations and estimating cost of reinstatement; professional practice and legal questions affecting the profession, &c.

### COLOUR BLINDNESS.

**A**PAPER on “Colour Blindness” was read before the members of the British Association by Dr. Karl Grossmann. The question of colour blindness, he said, which, when first described ninety years ago, had only the interest of a scientific curiosity, has become one of very great importance in our age of ocean and railroad racing. Colour blindness in its typical form is congenital, and with the very rarest exception, is double-sided; it is either red-green blindness or blue-yellow blindness, or total colour blindness. As red-green blindness is the usual and most important form, we will consider it exclusively here for simplicity's sake. The colour-blind individual “makes mistakes” in distinguishing certain colours. To him the ripe strawberry and its leaves, the blossom of the pomegranate tree and its foliage, the blush on a rosy cheek and the sky, are three pairs of equal colours. The names given to certain colours by the sufferer may be right or wrong; they do not convey to him the correct notions. A keen perception of dark and light shades exists, and often leads to the correct naming of colours. Still, naming is utterly misleading as a rule. Holmgren has there-



fore modified Seebeck's mode of testing by placing a bundle of coloured skeins before the colour blind, who has to select to a given shade all those which match. If there be two different colours which appear absolutely alike to the colour blind, a pattern made of these two colours will appear as of one colour only. On this principle Stilling based his plates, an excellent idea, which, however, fails very often; the reasons will be seen soon. The author calls two such apparently identical but different fundamental colours "twin colours." Such colours are, for instance, a certain yellow and green. To these two we may find a third fundamental colour, equally identical to the colour blind, a certain red, thus forming with the two others a set of "triplet-colours." He now found that while a certain green and yellow were twin colours for all his colour-blind patients, the corresponding red was right for some, too dark for others, too light for others again. This he found was due to the way in which the different eyes perceived the spectrum. If the red end of the spectrum was shortened, certain reds appeared darker than to eyes with a normal extension of the spectrum. Dr. Grossmann utilised this by embroidering letters of three colours so as to form on a brownish ground a red letter, say an F, completing it by green in such a manner as to form a B. A red-green-blind eye with normal spectrum will then see a blank ground, while one with a shortened spectrum sees the letter F dark on a lighter ground. Another difficulty is the variability of the daylight, which affects the different colours in twin combinations to a different degree. Both these reasons explain why Stilling's plates so often fail. The wool letters, though very nice, handy, and without glass, are very apt to fade. In order to get a more uniform light, and also to more readily imitate the signal lights, patterns were formed of twin-coloured glass, cut into small squares and arranged into mosaic figures, between two plain glasses, so as to form a slide, which is put into a lantern. These slides are not subject to the variability of daylight, and will never fade. The little squares are hardly destructible.

## ARCHITECTURE OF WELLS CATHEDRAL.\*

By CANON CHURCH.

IF Professor Willis had made a study of the earlier documents in our archives, and if he had published his own account of the fabric, there would have been little more to say of Wells Cathedral. But he does not make any direct quotation from documents earlier than 1286, and the reports of his several lectures on the church in 1851 and 1863 are often so contradictory as to be hard to understand. For the early history we have hitherto had no other authority than Godwin, and the Canon of Wells in Wharton's "Anglia Sacra." According to these writers there is a blank in the history of the church between Bishop Robert, by whom the church was consecrated in 1148, and Bishop Jocelin, whose episcopate extended from 1206-1242. Godwin describes the church to which Bishop Jocelin succeeded "as ready to fall notwithstanding the great cost bestowed on it by Bishop Robert;" he says "he pulled down the greatest part of it, to witte, the west ende and built it anew from the very foundation." No mention is made of any work or of any worker on the fabric between the time of Bishops Robert and Jocelin. But it is highly improbable, in the first place, that there should have been this blank of forty or fifty years in this active period in the history of the church, or that the church should have been allowed to fall into ruins during the episcopate of Bishop Reginald, successor to Bishop Robert. Reginald de Bohun, a Norman, called also "the Lombard" from some Italian connection, was a great man with his master Henry II., was employed in early life in political embassies, and took part in all the chief councils of the reign; he had seen men and cities and churches in an age of building. Consecrated in 1174, on his way home from Rome in company with Archbishop Richard, the successor of St. Thomas at Canterbury, his first act was to induce Hugh of Burgundy, afterwards St. Hugh of Lincoln, to leave his cell in the Grande Chartreuse to become prior of the first house of the Carthusians in England, at Witham, in his own diocese of Bath; his next to consecrate a church to the newly-canonised St. Thomas the Martyr, in his uncle's diocese at St. Lo, which in its desecrated state still contains features of its semi-Norman architecture. Crossing into England with Archbishop Richard, the two arrived at Canterbury on September 4, 1174, the day before the great fire which laid in ashes the choir of Canterbury Cathedral. The rebuilding of Canterbury under William of Sens and William the Englishman was going on during his frequent visits to Canterbury, and he himself succeeded to the see of Canterbury in 1191. During his episcopate building was going on actively in his own diocese, at Witham, in the rise of St. Hugh's Church and Friary—at Bath, where he

restored two churches and founded the hospital of St. John—at Glastonbury, where he consecrated the newly-built western lady chapel in 1187. It is not probable that this active-minded bishop, who was following the footsteps of his predecessors in making Wells the centre of the diocese, and in building up the constitution of his church of secular canons by the addition of fifteen new prebends, and by the increased endowment of the canons, should have allowed the fabric of his church to fall into ruins.

On the other hand, we have positive documentary evidence that he was zealously promoting the building of the church, and that the church was rising in his time. In a charter of early date, attested by Richard, the dean, the precentor, and "almost all the canons" of the church, he expressly recognises his duty as bishop to provide "that the honour due to God should not be tarnished by the squalor of His house," and so in full chapter and with the assent and counsel of his archdeacons, he makes a grant in support of the fabric, until the work be finished, of the proceeds of all benefices in the diocese so long as they shall be vacant. This grant formed at once a large "fabric fund," at that time amounting on an average to an equivalent of several hundred pounds of our money. It was an act of great munificence, and supplied a precedent to Bishop Jocelin and to later bishops, and was appealed to by the chapter when Bishop Roger in 1245 and Bishop John of Drogheda, asserted their claims and sought to appropriate these sequestrations for their own use. Following this charter of Reginald's grant of a fabric fund, there are charters of gifts from individuals towards the church, which contain evidence that the church was being endowed and the fabric was being built. One charter there is which it is very pleasant for a canon of Wells to read, in which Nicolas of Barrow, in *ruidecanal* chapter of Castle Cary ("in capitulo apud Kari"), "in consideration of the good conversation of the canons of Wells" ("considerata canonicorum Wellensium honesta conversatione") and of the admirable structure of the rising church ("et surgentis ecclesie laudabili structura"), gives up his life interest in the temporalities of the church of Lovington, of which the advowson had been given before to the church of St. Andrew by the Lord of Lovington, Robert de Kari. So then the church of St. Andrew was rising and becoming an object of admiration, and drawing forth gifts from individuals in the time of Reginald. There is another charter, which is dated "in the second year after the coronation of our lord the king at Winchester," most probably the second coronation of Richard I., after his return from captivity in 1194. If so, it will belong to the third or fourth year of Savaric, successor to Reginald. In this charter Martin of Carscumbe (Croscombe) gives three silver marks towards the construction of the new work of the church of St. Andrew, and two marks towards the repair of the chapel of St. Mary therein, "ad constructionem novi operis . . . et ad emendationem capellae beatae Mariae ejusdem loci." So from these documents we know from Reginald's own words and acts that the support of the fabric was the object of his care and munificence; we know that in his time the church was rising and becoming a goodly structure; we know that new work and repair of a lady chapel was being planned or carried out, to which offerings were made in the first years of his successor's episcopate, and we may safely conclude that the church was not neglected and falling into ruin, but that building was going on between 1174-1196. This evidence is sufficient to show that the Canon of Wells and Godwin, who make no mention of Reginald, are not to be considered ultimate authorities in this portion of the history of the fabric. I do not enter into the architectural puzzles of the building, or attempt to discriminate what parts belong to Bishop Reginald in the twelfth century, what to Bishop Jocelin in the thirteenth. But I will ask you to remember this evidence bearing upon the fabric history of the latter part of the twelfth century, and of Bishop Reginald's time, when you look upon nave and transepts and the western arches of choir, which, as Professor Willis has said, bear an architectural character "unlike that of any ordinary Early English building," "only a little removed from the Early Norman style," which Britton says there could be little hesitation in ascribing to the reign of Henry II., 1154-1189, on architectural evidence.

I pass on to the documentary history of the fabric during Bishop Jocelin's time—1206-1242. It is disappointing that there is so little. The documents are altogether silent about the fabric after 1196, during the years of Savaric's wandering and litigious life, and the early years of Jocelin's episcopate down to 1219-20. Within that time Jocelin was being carried away into the current of political strife, himself an exile, and the property of the See confiscated (200*l.* a year, equivalent to not less than 4,000*l.* to 5,000*l.*), paid yearly into King John's hands. After his return in 1213 he was engaged in the civil war and in the suit with Glastonbury. One grant there is, during the time of Dean Ralph of Lechdale, 1217-1220, in which a canon of Henstridge gives land and money, with the wish expressed that by his help the work may rise the more quickly. "Ut fabrica celerius ad optatam consummationem

\* From a paper read at the meeting of the Somerset Archaeological Society at Wells.



mea sedulitate consurgat." This is the only charter in our documents of a grant to the fabric during Jocelin's time. This charter shows that the work had recommenced at that date (1220). It appears that the prebends had been assessed for the fabric, and in this case a voluntary offering is made over and above the assessment to hasten the work. Outside our documents, there are other evidences of building operations. The Close Rolls of Henry III. contain grants to the fabric in 1220 of sixty large oaks (*grossa robora*) from the forest of Cheddar; in 1224 of one penny a day, remitted from the rent of Congresbury Manor; in 1225, of five marks annually for twelve years; in 1226, of thirty oaks, and of smaller wood (*frusta*) to repair the bishop's houses at Wookey. But no mention is made of these grants in the Chapter documents.

While there is detailed evidence of the gifts of houses for the permanent residence of the canons, and for the schools of the church, no more is said about the growth of the fabric until the statement in a charter of Bishop Jocelin of the completion and dedication of the church on the day of St. Romanus—October 23, 1239. The date of this event is fixed by the charter of the grant of the manor of Winscombe to the canons, dated "on the morrow of St. Romanus, the day of the dedication of the church in honour of St. Andrew, the gentlest of the Apostles, *Apostolorum mitissimi*." No further detail is given of the dedication, no description of the parts then finished and consecrated. But three years after, in the year 1242 (on November 19), about a month before his death, Jocelin makes a concise statement of the building begun, continued, and completed by him. He speaks only in general terms in the preamble of a charter, in which he is making ample provision for the endowment of all the members of the cathedral staff, as a duty no less binding than the support of the fabric. He records what he had done for the fabric of the church, which he says he found dangerous by reason of age ("periculum ruinæ patiebatur pro sua vetustate"). He had built, enlarged, and consecrated ("ædificare cœpimus et ampliare . . . in qua adeo profecimus . . . quod ipsam consecravimus"). Then he goes on to say that the common revenues of the ministers of the church had hitherto been scanty ("tenuis et insufficiens"), and to make the arrangements for their permanent augmentation. With no other authority than these words of the preamble to Bishop Jocelin's charter of increased endowment of the cathedral staff, the Canon of Wells, writing in vague language in Bishop Bubwith's time, that is, 180 years later, says that Jocelin had pulled down and rebuilt the church, from pavement to vault.

Bishop Godwin (1616) affects more precision in his statement. "The church of Wells being now ready to fall to the ground, notwithstanding the great cost bestowed upon it by Robert, he (Jocelin) pulled down the greatest part of it, to witte, all the west ende, built it anew from the very foundation, and hallowed or dedicated it October 23, 1239." So Professor Willis has assumed, on Godwin's authority, that "Jocelin himself asserts in one of his statutes that he pulled down the church and rebuilt it." Do Jocelin's words in this charter justify this assumption? They certainly do not to my mind—not even as read by themselves, much less when read in connection with Bishop Reginald's words and acts, and with the history of the time intervening between Reginald and the completion and consecration of the church by Jocelin in 1239-42. The words themselves occurring in the preamble to a charter relating mainly to another subject, the better endowment of the church yet remaining to be done, are general, not precise, in their review of what has been done. As it seems to me the words do not necessarily demand a more definite meaning than that, having begun, he had brought to an end the work he had undertaken, in the repair and enlargement of his church, which he found unfinished, old and ruinous in parts, and suffering from neglect and dilapidations of time. Reconsecration was necessary from the changes and additions which had been made both by Reginald and Jocelin since Bishop Robert's consecration, nearly one hundred years before, in 1148; and it was enforced at this time by the orders of the Papal legate, according to which several other churches were consecrated about the same time. The state of dilapidation and partial ruin in which Jocelin says he found the church might well have been the effects of some twenty or thirty years of neglect of an unfinished building, in such times, under the wasteful episcopate of Savaric, the confiscations of King John, the civil war, the intolerable exactions of Papal legates, and the local quarrels with the great rival power at Glastonbury going on to 1218-19. But we must not detract from Bishop Jocelin's greatness. If contemporary documents do not justify the statements of Godwin, nor the general tradition that Jocelin did everything at Wells—that he pulled down and rebuilt the whole church—yet there is sufficient evidence that he did very much, quite sufficient to justify the tradition that he was in a true sense "the maker" of Wells. He and his brother Hugh, afterwards of Lincoln, were "men of the soil," of Launcheley, of Wells, "wholly Wells" (as Godwin says), living through Reginald's episcopate, Hugh as archdeacon, Jocelin canon of Wells, rising to honour as judges, and becoming by office and royal grant

possessed of riches, manors, and benefices. Hugh gave largely of his great wealth to his brother Jocelin for the church, and Jocelin gave all that he had to "the church he loved so well, in which he had been nourished from his infancy," where, as his fellow-canons attested before his election, "he had lived in all good conscience among them hitherto."

Thus the two brothers, in a spirit of local patriotism and pious devotion, which will compare with that of Florentine citizens and builders of Italian towns, became the makers of their native town. The Registers bear witness that after his return from exile Jocelin was working steadily through troublous times to build up the constitution of his church of secular canons at Wells, on the lines of his predecessors, Reginald and Robert—increasing the prebends, remodelling the offices, giving full and definite duties and additional endowments to every member of the staff of the church, providing hospital, schools, houses for the resident canons, making and stocking his park at Wells, building and repairing houses and a chapel at Wookey. He was not the creator, but the remodeller, legislator, and finisher of the constitution. So as builder of the fabric he continued and finished the work of his predecessors, repairing and rebuilding what was dilapidated or unfinished, adding largely new and original work, and when sufficiently completed in interior arrangements and endowment he consecrated his finished work shortly before his death.

Professor Willis has told us that the date of the consecration of the church by Jocelin in 1239 agrees "with that phase of Early English work which the architecture of the west front presents," and that the west front "is built in the fully-developed Early English style in which Salisbury is built." We know that Jocelin was a frequent visitor at Salisbury, while Bishop Poore was building. He was present at the consecration of the choir in 1225; he was one of the commissioners named by the Pope to pronounce on the merits of St. Osmund for canonisation in 1228. The architecture and contemporary evidence lead to the conclusion that the west front was Jocelin's special work while repairing and completing the unfinished nave of his predecessors. If this was so, it would have been a noble achievement for the last twenty years of a troubled episcopate. If he did this, and no more than this, it would not be difficult to imagine how the tradition would have grown that he was the builder of the whole church. Amidst the obscurity attaching to the early building in the troublous times of the twelfth century, Jocelin's fame as benefactor, legislator, builder of the west front, and the finisher of the church, would eclipse the fame of his predecessors, and invest him justly with the title of "the builder of church," "as if there had been none like him, nor would be after him." But with these documents before us, I claim that those who went before and prepared the way for Jocelin's achievements should not be forgotten.

"Vixere fortes ante Agamemnona." Jocelin is first and foremost, but Reginald de Bohun ought to hold the second place of honour between Robert and Jocelin as one of the "makers of Wells," one of the "first three" master builders of our holy and beautiful house of St. Andrew in Wells.



#### Oriental Architecture in England.

SIR,—In the *Times* of September 6, Mr. H. Devey Browne, of Eastbourne, questions my views (see *The Architect*, September 7) as to the advantages of English architects using externally certain coloured materials. If you will allow me, I will quote his words, and reply to them as I proceed. After admitting that I urge that we should adopt a *suitable style of architecture* to display the various coloured materials—granites, porphyries, quartz, and serpentines—found in this country, he says, "I would venture to suggest that the really good English architects before the eighteenth century were satisfied with the quiet colours of homely brick and stone." To this I would reply that, if they were, they would be quite satisfied with the subdued tones of the igneous rocks. The richest-coloured red granites or red elvans are mildness itself compared with ordinary red bricks, and though yellow quartz may be a little more brilliant than buff stone, the architect who is an artist, as every architect should be, will know how to use it so that it shall harmonise the green and purple tints of the porphyries and serpentines, which again could be subdued by the black basalt of Cree Hill or developed by the white quartz of North Cornwall or the white elvan of Okehampton. Then Mr. Browne asks, "Does Mr. Travis think that the modern architect, with all the colours of the rainbow at his command, could design anything as good as the erections of our ancestors?" To this I say that, having the benefit of all that has been done in the past, together with the aid of modern science, he ought to be able to surpass his ancestors in the art of architectural



design; but that he will do so I have my doubts, like Mr. Browne, because he has such an inveterate habit of copying ancient work suitable to past times, instead of basing his designs upon modern requirements and taking advantage of the wider field in the choice of materials which modern science has placed at his command. His ancestors did this as far as it was in their power, and it is as certain as anything can be that, if living at the present day, they would do what I have ventured to suggest, viz. use the igneous rocks in external architectural construction, both on account of their innate beauty and their absolute durability in the noxious atmosphere of the metropolis and other large towns. Then Mr. Browne asks, "Will not Nature give a delicacy of colour on lichen wall and mossy roof, which is far more picturesque than the hard, smooth, unchanging colours of marble and granite?" Here I may say that I admire the colours with which Nature invests everything when she is not interfered with as much as Mr. Browne, but my proposal applies solely to city architecture, and that I think it is only necessary for any one to stand in front of the Crimean monument in Westminster, or other granite structure, to be convinced of the value of these materials in the construction of town buildings. Twenty years have passed since its erection, and the granite shaft is as perfect as when the workmen departed. Not so the freestone work, which is a fuliginous mass of scarcely distinguishable detail. Within a bow shot he will also see the Houses of Parliament, on the restoration of the stone of which 2,500*l.* are annually spent. Such an edifice could now—in this age of science—be erected of porphyry, quartz, and granite, that would not only cost nothing extra, and not cost a farthing in repairs, but would remain unchanged in the sooty atmosphere of London. If ancient examples be asked for they are sufficiently numerous. Of course there could be no elaborate tracery, but only simple splays—no florid carving, but only mosaic work; but as compensation there would be equal beauty of outline, a surface of unfailing burnished texture, and an everlasting glow of colour which, in my opinion, is a very essential element of design in a cold and grey climate like our own, though some writers on this subject seem to forget that contrast in art is as important and necessary as harmony. Finally, having answered most of Mr. Browne's questions, I may fairly ask him one. Is he aware that all the architecture of the West originated in the East? Apologising for the length of my remarks,—I am, sir, yours truly,

HENRY TRAVIS.

The Limes, Streatham : September 11.

#### Theatre Exits and Fire Risks.

SIR,—Your correspondent, Mr. Macpherson, has made a practical and valuable suggestion in pointing out that the mere existence of a fireproof screen or curtain, however perfect it may be, would not suffice to prevent panic unless it be lowered between each act, thus familiarising the public with the fact that the auditorium can be completely shut off from the stage at a minute's notice in case of fire. As this correspondence is likely to be read by a very large number of people, I think it would be extremely useful if the inventor of the new fireproof curtain would explain, in your next number, as lucidly as possible, his reasons for claiming his curtain to be perfectly fire-resisting. If I may venture to make one more request, I should like some of your correspondents to suggest means by which audiences could leave places of amusement in event of a scare without running the great risks they at present do.—Yours truly,

E. YEOMANS.

High Street, Aston, Birmingham :  
September 12, 1888.

SIR,—Will you kindly insert the following remarks in your next publication respecting fire in theatres? I cannot refrain from expressing my hearty concurrence with Mr. Macpherson's letter in your last week's issue, with reference to thoroughly instructing theatre-goers as to what is being done to protect their lives in case of fire. No doubt you and your correspondents are already doing some good in drawing attention to the steps which might be, and in some cases have been, taken to render theatres fireproof, and the discussion raised in your columns may eventually induce theatre managers to take a *bond-fide* interest in demonstrating to their audiences that fire risk has been so minimised, that there remains no practical danger of a fire spreading from the stage to the auditorium. When theatres have been burnt down from time to time, and vast numbers of persons sacrificed, an active discussion has generally ensued as to how a recurrence of such disasters can be avoided, but the popular excitement rapidly subsides, and the public once more relapses into a state of composure, leaving the question of life and death to the solution of theatrical managers and architects.

As a plain matter of fact, theatres can, without difficulty and with absolutely less cost than under the present faulty

system, be rendered absolutely fireproof. Of course the architectural mind is averse to own that the existing system has proved a deadly failure, and hence it becomes the duty of the theatre-going public to so agitate this vital question, as to ultimately make it compulsory on theatrical architects and managers to adopt the means at their disposal for constructing theatres which shall be actually fireproof, without, of course, disturbing the laws of acoustics.

While due consideration must be given to the results of any possible panic, every modern improvement should be made use of to prevent the fire from spreading from the stage to the auditorium, and above all to prevent panic by keeping the audience in ignorance that any fire exists. The obvious way to do this is by instantly shutting or lowering an impenetrable screen or curtain similar to that suggested by one of your recent correspondents, and which seems to me from the material employed in its construction to be well adapted for the purpose, as there can be no doubt that silicate cotton is not only incombustible, but a perfect resistant of heat, however intense it may be.—Yours faithfully,

R. MACGREGOR.

149 Grange Road, Birkenhead : September 12, 1888.

SIR,—The recent letters in your issues of the 17th, 24th, and 31st ult. on the above subject imply a misapprehension of the manner of constructing an iron-framed asbestos cloth fireproof curtain, as practised by this company. May I count on your courtesy to insert the following few remarks in refutation of the prevalent misconceptions on this subject?

We continue to maintain that a single curtain fixed on a roller is useless in preventing the spread of fire, as the weight of the roller would not suffice to keep the curtain from bellying, as happened at the Exeter Theatre, nor to prevent the flames and smoke from entering the auditorium; nor would we by any means recommend a single curtain on an iron frame, as in such a construction the ironwork would be exposed to direct contact with the flames, and an unequal expansion would take place, resulting in the buckling or twisting of the framework.

The form of curtain which we recommend is the double asbestos metallic cloth curtain, on an iron frame, with an air-space between the two cloths. Although the floss asbestos usually used with gas stoves instantaneously becomes incandescent when brought into contact with flame, this is not the case when asbestos of the kind employed for curtains is converted into a textile fabric. A practical proof of this was afforded by the action of the committee of justices appointed by the Birmingham magistrates to consider the provisions necessary for the protection of the public against fire in the theatres and music halls in that borough. In the report of this committee, read at the annual meeting of the magistrates on January 4, 1888, Mr. Jaffray stated:—"Your committee caused a piece of the material of which the asbestos curtain is made to be placed over, but close to, the flames of several gas-jets for about half an hour. At the end of that time there was no trace of burning, nor was the material made very hot. It appeared to your committee that it was not only fireproof but smokeproof, and the curtain when down would completely prevent the audience seeing any smoke or fire on the stage, and would, therefore, to a considerable extent prevent panic." In moving the adoption of the report, Mr. Jaffray said:—"They directed their attention specially to the cutting off of the stage from the auditorium. . . . The means Mr. Simpson had very thoughtfully taken at the Theatre Royal for cutting off entirely the stage from the auditorium would prove effectual. He had provided an asbestos curtain . . . and the committee were convinced that it would successfully resist intense heat for such a length of time as would enable a large audience to escape." The low conductivity of spun and woven asbestos, therefore, affords, in our opinion, a guarantee against such an increase of temperature in the ironwork as to cause it to buckle or twist before the audience had ample time to get out. The statement as to incandescence is also disposed of by this report; but supposing, for argument's sake, that such an intense heat were generated on the stage as to cause the asbestos cloth on that side to become incandescent, it would still be impervious to flame, and the air-space between the two cloths would effectually prevent any abnormal development of heat on the side next the auditorium. Another simple and effective preventive of incandescence, the adoption of which we strongly recommend, is a row of automatic sprinklers at the top of the curtain, which, in the event of fire, would keep the cloth thoroughly wet. These curtains can be lowered in ten seconds or less, and would confine the fire solely to the stage. The audience would be enabled to quit the theatre without panic, which is the cause of more injury and loss of life than actual fire; and the usual means of extinction—sprinklers, hydrants, &c.—could be manipulated without hindrance. Should, however, the iron framework be objected to, another method of construction (Marius's patent) can be adopted, by which the curtain (double with an air-space) can be run up in folds and rapidly lowered.

Prevention, doubtless, is better than cure, and if all stage



appliances were coated with asbestos fireproof paint, there would be no danger of any material so treated catching fire; but it is always the unforeseen which happens, and even with the most careful supervision, there might come a time when some inflammable material in use might ignite, and it is beyond doubt that the advantage of the asbestos fireproof curtain would then be recognised.—Your obedient servant,

J. ALFRED FISHER, Manager and Secretary,  
The United Asbestos Company, Limited.

### SCHOOL BUILDINGS.

**Brierley Hill.**—The new schools at Mount Pleasant, Quarry Bank, for the Kingswinford School Board, were opened on Monday last. They have been erected from the designs of Messrs. G. B. Nichols & Son, architects, Colmore Row, Birmingham, by Messrs. H. Dorset & Son, builders, Cradley Heath. The buildings are planned for the accommodation of 360 children, viz. 234 mixed and 126 infants, each having separate entrances in connection with cloakrooms and lavatories. The mixed school is 65 feet by 20 feet, with two classrooms, each 24 feet 8 inches square and teachers' room. The infants' schoolroom is 30 feet by 22 feet, with classroom 22 feet by 20 feet and teachers' room. The materials used are red brick relieved with moulded and other bricks. In the gables at each end of the schools is the Board's monogram, and occupying the central position is the stone bearing the date of the erection of the schools. The roof of the buildings is slated, the ridges being finished with red ornamental crest tiles and terra-cotta finials, and over the girls' and infants' entrance is a bell turret, 48 feet high, with lightning-conductor fixed by Mr. J. Blackburn, of Nottingham. In the schoolrooms and classrooms is a dado of wood, 4 feet high, stained and varnished. The porches and passages have a dado of white glazed bricks, and the floors are paved with red and blue Staffordshire quarries. The whole of the rooms are partly open, the ceilings boarded, stained and varnished, and are well lighted with large windows, the upper parts of which are filled with Leggett's casement adjusters. The floors are laid with wood-block paving. Boyle's inlet ventilators are used, and there are also outlet ventilating turrets in the roof. The schools are heated throughout by hot-water apparatus supplied by Mr. J. Attwood, engineer, of Stourbridge. The lavatory fittings are of Macfarlane's manufacture.

**Cheetham.**—The memorial-stone of a new school which is being built by the Manchester School Board, in Waterloo Road, to accommodate the children at present attending the temporary schools at Salem chapel and the Congregational church, in Bury New Road, has been laid. In these schools there are at present about 750 children, but the new premises will accommodate over 1,000. They are to cost about 13,250*l.*, and are being erected by Messrs. R. Neill & Sons, from plans prepared by Mr. H. Lord, architect.

**Glasgow.**—The Roman Catholic school built on the west side of Sandyfauld's Street has been opened. The building is a handsome and substantial structure, designed by Messrs. Pugin & Pugin, of Westminster. Red sandstone, with rock facing, is used for the front of the building, and vitrified bricks are the material put into the gables and back portions of the erection. All the latest School Board improvements are taken advantage of in the fitting-up of the interior of the three storeys of which the building consists, and the lighting and ventilation are on the most approved methods. The contract price for the building was 5,000*l.* The school will accommodate 1,300 children.

**St. Albans.**—The memorial-stone of the extensions to the Wesleyan Sunday school has been laid. The cost will be about 1,500*l.* The ventilation throughout has been amply provided for, and the vitiated air will be extracted by Boyle's patent extractor. The architect is Mr. James Weir, F.R.I.B.A., 9 Victoria Chambers, Westminster, and the contractors are Messrs. Chamberlain & Birrell, of St. Albans.

### CHURCH BUILDING AND RESTORATION.

**Grimsby.**—Plans are in preparation for a new memorial church, to seat 500 persons, for the parish of St. Andrew, Grimsby. The style of the work is Perpendicular, consisting of nave, north and south aisles, chancel, memorial morning chapel, organ chamber, western baptistery, and vestries. The materials to be used are red brick with stone dressings, the roofs being covered with Broseley tiles. The arms of the donor, together with the See of Lincoln, will be introduced in the gables of the western porch. Mr. E. W. Farebrother, F.R.I.B.A., Grimsby, is the architect.

**Kilmaurs, N.B.**—The parish church of Kilmaurs has been reopened after renovation. The works have been carried out from the designs of Mr. R. S. Ingram, architect, Kilmarnock,

the contractors being:—Masons, J. McLachlan & Sons, Irvine; joiner, David Wood, Kilmarnock; slater, Robert Millar, Stewarten; plumber, W. Murchland, Kilmarnock; glazier-work, A. & G. Gilchrist. The total cost of the rebuilding is about 1,500*l.*

**Lower Gornal.**—The foundation-stone of a chancel for the church of Lower Gornal has been laid. The plans of Mr. T. H. Fleeming, architect, Wolverhampton, were adopted, and the tender of Messrs. Holland, of Dudley, to execute the work was accepted.

### GENERAL.

**Sir John Gilbert** has resigned the presidency of the Royal Water-Colour Society.

**The Exhibition of Pictures** at the Wolverhampton Art Gallery is to be opened on the 25th inst.

**The Architectural Association**, by leave of the Marquis of Salisbury, paid a visit on Saturday to Hatfield House, when Mr. J. A. Gotch, the past president, described the history and chief features of the building.

**The First Exhibition** of the South Wales Art Society and Sketching Club will be opened in Cardiff to-morrow (Saturday).

**MM. Trélat and Vaudremer**, the French architects, have been appointed members of the organising committee of the International Sanitary Congress, which will be held next year in Paris.

**The Plans** of Mr. Leonard Stokes for a Roman Catholic church to be erected in Guildhall Street, Folkestone, have been approved of by the Corporation.

**A Committee** has been appointed to obtain a site for a proposed United Presbyterian church in Dundee.

**Mr. G. C. Dewhurst** has promised the sum of 1,000*l.* towards the rebuilding of Lymm parish church tower, which is to be carried out under the direction of Mr. Crowther.

**The Leith Dean of Guild Court** on Monday granted a warrant for the erection of a theatre in the Kirkgate. The plans show accommodation for about 1,000 persons.

**The Coventry City Council** on Tuesday acceded to a request from the South Kensington Museum authorities, asking for the loan of one of the Coventry maces of the date of Charles II., to reproduce it by electrotyping for exhibition in the museum and affiliated institutions, as an addition to the collection of corporation and university plate.

**Plans** have been prepared for laying out eleven acres of land belonging to the town of Hyde, Manchester, as a cemetery. The estimate of Mr. Beaumont, the architect, is 6,051*l.*, of which 1,556*l.* is for a chapel and 800*l.* for a lodge.

**The Municipal Council** of Copenhagen have voted 50,000*l.* for the construction of municipal buildings.

**A New Vicarage House** in connection with the church of St. Leonards is to be built at Thornton-le-Street, near Thirsk.

**A Canal** is proposed to be constructed to connect the Black and Caspian seas. A sum of 40 millions of roubles is estimated to be required for the work.

**The Metropolitan Board of Works** closed Lambeth Bridge on Saturday last, the day of a regatta, owing to its dangerous condition.

**The Dean and Chapter of Lincoln** are about to restore the chapter-house of Lincoln Cathedral. The cost is estimated at about 7,000*l.*

**Plans** by Mr. E. W. Farebrother, F.R.I.B.A., of Grimsby, for new schools for 1,000 children, arranged on the central hall system, were approved by the Cleve-with-Weelsby School Board on Wednesday, the 5th inst.

**Healing Manor**, N. Lincolnshire, is now being remodelled from the designs and under the superintendence of Mr. E. W. Farebrother, F.R.I.B.A., architect, of Grimsby.

**Mr. Donald Robertson**, formerly master of Smith Street Branch School of Art, Birmingham, has been appointed head-master of the Walsall School of Art.

**The Governors** of the York County Hospital on Monday decided that plans which have been prepared for additional rooms to be erected over the Watt Ward should be carried out. In 1874 the late Mr. Richard Watt, of Bishop Burton, left a legacy of 4,500*l.* for the building of a new ward, which has been completed at a cost of 3,800*l.*, and the residue of the bequest, with accumulated interest amounting to over 1,000*l.*, leaves a sufficient sum to cover the cost of the proposed additions.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, SEPTEMBER 14, 1888.

## THE ARCHITECT AND CONTRACT REPORTER.

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### EDITORIAL NOTICES.

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

### COMPETITION OPEN.

GORTON.—Sept. 15.—Designs are Invited for Public Baths. Mr. R. T. Holland, Clerk to the Local Board, Local Board Offices, Gorton.

### CONTRACTS OPEN.

APPERLEY BRIDGE.—Sept. 15.—For Building Mill, Shed, Engine-house, Boiler-house, and Chimney. Messrs. J. Kendall & J. H. Bakes, Architects, Idle.

BELFAST.—Sept. 17.—For Proposed Sheds for the Belfast Rope Works Company, Limited. Mr. R. Watt, architect, 77A Victoria Street, Belfast.

BELFAST.—Sept. 24.—For Building Tower and Spire to Catholic Church, Holyrood. Mr. M. H. Thomson, Architect, 65 Upper Arthur Street, Belfast.

BIDEFORD.—Sept. 21.—For Widening Quay. Mr. Henry Chowins, Borough Surveyor, Bideford.

BOURNEMOUTH.—Sept. 18.—For Enlargement of the East Cliff Congregational Church and Schools. Messrs. Lawson & Donkin, Architects, Beckford Buildings, Bournemouth.

BRADFORD.—Sept. 18.—For Building Hide, Skin, and Tallow Auction Mart, with Dwelling-house, Offices, and other Buildings. Mr. G. C. Gamble, Architect, 225 Leeds Road, Bradford.

BRISTOL.—Sept. 15.—For Additions to Premises, Wine Street, for Messrs. Belfield & Sons, also for Mr. W. B. Biggs. Mr. Henry Williams, Architect, 28 Clare Street, Bristol.

CARDIFF.—Sept. 14.—For Building Sunday School and Cottage. Mr. E. M. B. Vaughan, Architect, 20 St. Mary Street Cardiff.

CHESLYN HAY.—Sept. 15.—For Building New Schools. Mr. W. Wood, Architect, Longton.

CROUCH END.—Sept. 18.—For Building two Residences for Mr. C. A. Mackness. Mr. S. W. Brooking, Architect, 44 Finsbury Circus, E.C.

DENT.—Sept. 15.—For Restoring Church. Mr. W. Wright, Surveyor, Lancaster.

DEWSBURY.—Sept. 19.—For Building Organ Chamber and Choir Vestry, St. Matthew's Church. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

DUBLIN.—Sept. 25.—For Construction of Four Iron Street Bridges. Mr. E. Maunsell, Secretary, Westland Row Terminus, Dublin.

EXNING.—Sept. 17.—For Building Cottage Hospital, Boundary Walls, &c. Mr. Thomas Ennion, Deva Chambers, Newmarket.

FARSLEY.—Sept. 21.—For Building Stockrooms, Offices, &c. Mr. C. S. Nelson, Architect, Albert Chambers, Park Row, Leeds.

FINSBURY PARK.—Oct. 2.—For Building Store Shed. The Superintending Architect, Metropolitan Board of Works, Spring Gardens.

FULHAM.—Sept. 19.—For Building Stables for Fifty Horses, with House and Office. Mr. C. J. Foakes, Clerk to the Vestry, Walham Green, S.W.

GREAT YARMOUTH.—Sept. 19.—For Additions to Board School. Messrs. Bottle & Olley, Architects, Regent Street, Great Yarmouth.

HEATON.—Sept. 15.—For Building Pair of Villas. Mr. Herbert Isitt, Architect, Sunbridge Row, Bradford.

HUDDERSFIELD.—Sept. 20.—For Building Shops and Nine Dwelling-houses. Messrs. John Kirk & Sons, Architects, Huddersfield.

LONDON.—Sept. 20.—For Enlargement and Erection of Board Schools, &c. The Architect's Department, School Board Offices, Victoria Embankment.

LONDON.—Sept. 18.—For Bakehouse and Stable, for the Battersea and Wandsworth Co-operative Society. Mr. T. E. Webb, Secretary, 2 Plough Road, S.W.

LONGTON, STAFFS.—Sept. 15.—For Building two Houses near Clayton Street. Mr. W. Wood, Architect, Longton.

LOWER FITTLEWORTH.—Sept. 14.—For Building House. Mr. William Buck, Architect, Horsham.

NEWBURY.—For Repairs to Corn Exchange. The Borough Surveyor, Newbury.

NOTTINGHAM.—For Additions, &c., to Villa Residence Sherwood Rise. Mr. H. Sulley, Architect, Wheeler Gate, Nottingham.

OTLEY.—Sept. 19.—For Building Workshop. Mr. Arthu Longfield, Silver Mills, Otley.

RHEWL, MOSTYN.—Sept. 14.—For carrying out Works for Water Supply. Mr. J. L. Williams, Sanitary Inspector, Brynford, Holywell.

SALCOMBE.—Sept. 22.—For Building Chancel and Porches to Church. Mr. J. May, Courtenay Street, Salcombe.

TUNBRIDGE WELLS.—Sept. 15.—For Building Pair of Semi-detached Houses and Three Detached Houses, Moun Ephraim. Mr. Wm. B. Hughes, Architect, 43 London Road Tunbridge Wells.

WEYMOUTH.—Sept. 19.—For Harbour Improvement Works Quay Wall, Landing Jetties, Retaining Wall, Sea Wall, Diversion of Esplanade, Toll-house, Entrance Gates, Shelters, &c.

\* Names and addresses to be forwarded not later than date.



Mr. W. Barlow Morgan, Borough Surveyor, New Street, Melcombe Regis.

WICKERIDGE.—Sept. 20.—For Building Pair of Semi-detached Cottages. Mr. W. Barrons, Weir View, Totnes.

WIGAN.—Sept. 19.—For Sanatorium Buildings. The Borough Engineer, Wigan.

WOLVERHAMPTON.—Sept. 20.—For Enlarging Instrument-room at Post Office. The Postmaster, Wolverhampton.

YEADON.—Sept. 20.—For Building Villa. Mr. George Foggitt, Architect, Yeadon.

YORK.—Sept. 18.—For Billiard-room. Mr. James A. Green, Hon. Secretary, Fulford District Conservative Club, York.

### TENDERS.

#### ARNOLD.

For Making, Metalling, and Channelling Portland Street, Arnold, near Nottingham, for the Arnold Local Board of Health. Quantities by the Engineer, Mr. F. JACKSON, C.E., 18 Low Pavement, Nottingham.

Frederick Messom . . . . .	£287	0	0
William Frost . . . . .	259	12	2
John Greaves . . . . .	217	12	0
Edward Cope . . . . .	211	3	0
Arthur Raynor . . . . .	210	3	2
R. & G. Holmes . . . . .	200	0	0
John Hawley & Son . . . . .	195	0	0
WILLIAM CORDON, Burton Joyce, near Nottingham (accepted) . . . . .	179	6	0
Engineer's estimate . . . . .	211	0	0

#### BELTON.

For Building Cottage at Belton, near Great Yarmouth. Mr. CHARLES G. BAKER, Architect, Town Hall Chambers, Great Yarmouth. Quantities by Architect.

Brooks, Belton, near Great Yarmouth . . . . .	£365	15	0
Barnard, Great Yarmouth . . . . .	352	15	0
Springall, Great Yarmouth . . . . .	320	0	0
Kemp, Gorleston, Great Yarmouth . . . . .	298	0	0
Hawes, Great Yarmouth . . . . .	282	0	0
HARWOOD & BECKETT, Great Yarmouth (accepted) . . . . .	266	10	0

#### BRAZIL.

For Machinery and Plant for Brazilian Extract of Meat and Hide Factory, Limited, Porto Alegre, Brazil, from the designs of Mr. FREDERICK COLYER, Civil Engineer, 18 Great George Street, Westminster, S.W.

##### No. 1 Contract.—Extract of Meat Plant.

Fawcett, Preston & Co. . . . .	£1,970	0	0
Pontifex & Wood . . . . .	1,644	0	0

##### No. 2 Contract.—Patent Water-tube Boilers.

Patent Steam Boiler Co. . . . .	2,879	0	0
Babcock, Wilcox & Co. . . . .	2,060	0	0

##### No. 3 Contract.—Pumping Machinery.

Simpson & Co. . . . .	997	0	0
G. Waller & Co. (error in estimate) . . . . .	886	0	0
Moreland & Son . . . . .	695	0	0
Fawcett, Preston & Co. . . . .	690	0	0

##### No. 4 Contract.—Charcoal Plant.

G. Waller & Co. . . . .	498	0	0
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##### No. 5 Contract.—Lancashire Boilers.

Fawcett, Preston & Co. . . . .	2,290	0	0
Horton & Son . . . . .	2,040	0	0
Thornewill & Wareham . . . . .	1,970	0	0

#### BRENTFORD.

For Covering over Brook, for the Brentford Local Board. Mr. F. W. LACEY, Surveyor, Brentford.

H. Haynes, Alperton . . . . .	£875	0	0
E. Rogers & Co., Notting Hill . . . . .	873	0	0
G. Bell, Tottenham . . . . .	848	0	0
G. R. Rackham & Co., Colchester . . . . .	713	0	0
W. Parker, Brentford . . . . .	675	13	10
W. NEAVE & Co., Paddington (accepted) . . . . .	649	10	9

#### GRAVESEND.

For Alterations, Shop Fittings, and other Works at Nos. 3, 5, and 7 Harmer Street, for the Gravesend Co-operative Society, Limited. Mr. A. G. SMITH, Architect, 1 Darnley Street, Gravesend.

W. H. Archer, Gravesend . . . . .	£522	0	0
R. Gates, Gravesend . . . . .	519	10	0
A. C. Rayner, Gravesend . . . . .	509	0	0
MULTON & WALLIS, Gravesend (accepted) . . . . .	446	10	0
W. & E. Wallis, Gravesend . . . . .	438	0	0

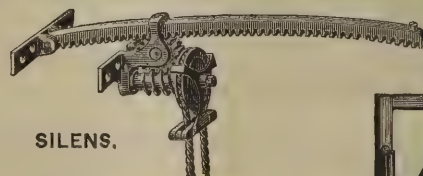
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The WILMOS is worked with a rod or endless cord. It is extremely neat, and can be fixed to open either top or bottom, inwards or outwards; no cutting away of frame required. When worked with a rod is most efficient for Public Buildings, as the key can be loose. For Price Lists Illustrations, and Testimonials, write as below.

For Continuous and other Lights, Estimates given.



WILMOS.

NO CUTTING AWAY OF FRAME REQUIRED.

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SIRS,—I have pleasure in testifying that I have used Leggott's Silens Adjustments for various buildings to high skylights, fanlights, and top parts of windows, and in every case they gave satisfaction. They are secure in whatever position, whether the window is open or closed, and are quite simple and workable in their action. I prefer them to any other that I have seen or used for the above-mentioned purposes.

Messrs. W. & R. LEGGOTT, Bradford.

I remain, yours obediently,

R. DAVIES, Architect.

BANGOR: N. Wales: Sept. 14, 1885.

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EPSOM.

Additions and Alterations to Union Workhouse, Epsom, Surrey, for the Guardians. Mr. HERBERT D. APPLETON, F.R.I.B.A., Architect. Mr. F. J. W. Miller, Quantity Surveyor.

Jeal . . . . .	£10,250	0	0
Parker . . . . .	9,949	0	0
Clarke & Bracey . . . . .	9,539	0	0
H. Knight . . . . .	9,465	0	0
A. Bricknell . . . . .	9,290	0	0
Shillitoe & Son . . . . .	9,250	0	0
Taylor . . . . .	9,250	0	0
G. Stephenson . . . . .	9,187	0	0
Goddard & Son . . . . .	9,186	0	0
Rose & Co. . . . .	9,048	0	0
J. Wyatt . . . . .	8,920	0	0
H. Willcock . . . . .	8,885	0	0
E. J. Burnand . . . . .	8,642	0	0
Ward Bros. . . . .	8,604	0	0
R. Wood . . . . .	8,583	0	0
T. Martin . . . . .	8,565	0	0
J. Longley . . . . .	8,400	0	0
A. R. Flew . . . . .	8,290	0	0
Howe & White . . . . .	8,250	0	0
W. H. Lowden & Son . . . . .	8,250	0	6
Ward, Clarke & Co. . . . .	8,157	0	0
J. Chappell . . . . .	8,146	0	0
W. H. Simmonds . . . . .	7,991	0	0
R. J. Humphris . . . . .	7,700	0	0
H. Tarrant . . . . .	6,982	0	0

FERNDALE.

For Building Nine Houses, Taff Street, Ferndale, near Pontypridd, Glamorgan. Mr. E. JONES, Architect, 30 High Street, Cymmer, near Pontypridd.

John Maliphant, Ferndale . . . . .	£1,362	0	0
Jones & Edwards, Treorkey . . . . .	1,339	10	0
J. Price Powell, Cardiff . . . . .	1,320	15	0
JOHN DAVIES, Treorkey (accepted) . . . . .	1,302	15	0
William Jones, Ferndale . . . . .	1,273	10	0
John Rees, Pontypridd . . . . .	1,242	0	0
Morris Morris, Ferndale . . . . .	1,232	0	0
B. Jones, Pontypridd . . . . .	1,173	0	0
Architect's estimate . . . . .	1,267	10	0

GRIMSBY.

For Building Cemetery Chapels, Lodge, Waiting - room, Mortuary, &c., Grimsby. Mr. E. W. FAREBROTHER, F.R.I.B.A., Architect, Grimsby.

Shillitoe & Sons, Bury St. Edmunds . . . . .	£4,590	0	0
W. Smith, Grimsby . . . . .	4,400	0	0
Leaning, Grimsby . . . . .	4,388	0	0
F. Grant, Cleethorpes . . . . .	4,380	0	0
F. Southenr's Exors., Hull . . . . .	4,375	0	0
John White, Grimsby . . . . .	4,350	0	0
Roebuck & Gooseman, Grimsby . . . . .	4,150	0	0
Goodhand, Hewins & Co., Grimsby . . . . .	4,144	6	4
J. & R. G. Guy, Grimsby . . . . .	4,144	0	0
Walker & Cook, Grimsby . . . . .	4,126	0	0
Good & Co., Hull . . . . .	4,070	0	0
Enderly & Co., Grimsby . . . . .	4,066	0	0
Wortley, Doncaster . . . . .	3,995	0	0
Thomas Simonson, Grimsby . . . . .	3,929	0	0
Crossland, Newark . . . . .	3,800	13	0
J. M. THOMPSON & SONS, Louth (accepted) . . . . .	3,787	0	0

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For the Erection of House, Regent Road, Hanley, for Mr. Alexander Wayte. Messrs. R. SCRIVENER & SONS, Architects, Hanley. Quantities by Architects.

H. & R. Inskip, Longton . . . . .	£690	0	0
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Nathan Barlow, Stoke . . . . .	650	0	0
James Bowden, Burslem . . . . .	645	0	0
Thomas Godwin, Hanley . . . . .	640	0	0
Cornelius Comes, Hanley . . . . .	599	10	0
NICHOLAS BENNETT, Burslem (accepted) . . . . .	599	0	0

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Loosley, Wycombe . . . . .	2,907	0	0
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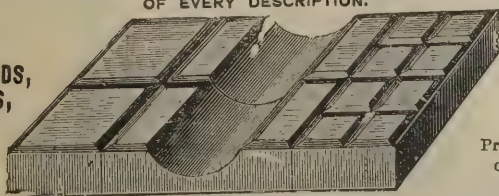
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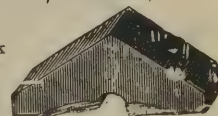
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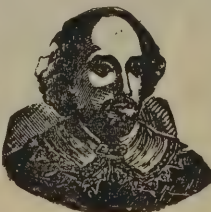
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submitted, which stated that the committee could not recommend the adoption of the electric light for the lighting of the streets alone, since such an experiment would not pay, but they were assured by local electric engineers that if the light were adopted for house lighting as well as street illumination it would be a thorough success, and give a good return on the capital invested. Further, they were assured that if a 40,000 lamp installation were entered into, the present price of gas could be successfully competed with.

MR. E. H. SHORLAND, of Manchester and London, has just supplied his patent Manchester grates to the Cheshire Lines Railway Committee for their new station at Heaton Mersey, near Stockport.

THE London Electric Supply Corporation are about to remove immediately to new and commodious offices at No. 3 Adelphi Terrace, Strand, their present offices at No. 79 Grosvenor Street being no longer sufficiently large for their rapidly-increasing business. The new central generating station of the Corporation at Deptford is rapidly approaching completion, and it is understood that the directors will be able to furnish a largely increased supply of the electric current before the close of the year.

THE contract for the erection of electrical controlling apparatus and signals in connection with the machinery in a new granary built by the Docks Committee of the Council of the City of Bristol, has been secured by Messrs. King, Mendham & Co., electrical engineers, of that city.

THE Edinburgh Town Council have approved of the Water of Leith Drainage Scheme, which it is estimated will cost between 50,000*l.* and 60,000*l.*

IN the new Queen's Theatre at Longton the fireproof floor, consisting of iron girders and solid concrete, has been laid by Mr. Roger Lowe, of Farnworth, Bolton.

AT the holding of the Labour Congress in Toronto, Canada, on Saturday, amongst others, resolutions were adopted asking the Dominion Parliament to pass a Bill to prohibit the importation of foreign labour under contract; demanding the abolition of the contract system in connection with national, provincial, and municipal works; and urging a radical change in the present patent laws.

MESSRS. WALKER, gas engineers, London, have contracted to construct the new gasometer for Perth Corporation Gasworks, at a cost of about 9,000*l.*

THE Standard Theatre will next month be put up for sale by auction by Sir J. Whittaker Ellis. The property, which is freehold, will be offered together with Bishopsgate Hall and other freehold premises which adjoin, in consequence of proceedings in Chancery.

THE prison authorities contemplate the erection of a new prison for Aberdeen and the district, the present building in Lodge Walk, to the rear of the Court-house buildings, being deemed unsuitable. The new prison will be designed to contain 100 cells.

THE late opening of the Baltic ports has had the effect of concentrating the timber trade of Grimsby into a short period. The Alexandra Dock is now filled with timber ships waiting to be discharged, and great difficulty is experienced in getting sufficient men to do the work, and several vessels have been unable to come to the port owing to the want of efficient labour to insure a quick discharge.

THE Lord Provost's Committee of Edinburgh Town Council have recommended the acceptance of an estimate for carrying out the proposed alterations upon the Edinburgh Police Chambers. The amount of the estimate is 2,288*l.*

THE ironmasters have advised the iron merchants of South Staffordshire of an advance of 5*s.* to 7*s.* 6*d.* and in some case of 10*s.* per ton, on the prices of ordinary merchant bars.

A NEW Bodega restaurant has been erected in Coleman Street, London, and special attention has been paid to the ventilation, Messrs. Robert Boyle & Son's latest improved self-acting air-pump ventilators being adopted for the extraction of the vitiated air.

THE Soap Works of Messrs. W. Taylor & Co, Broughton Road, Edinburgh, are to be reconstructed, the premises having been recently destroyed by fire.

#### UTILISATION OF ELECTRICITY.

IN the section of Mechanical Science at the Congress of the British Association in Bath, Mr. W. H. Preece read a paper on electricity. Having at the outset referred to the American philosopher, Franklin, who brought down atmospheric electricity by his kite string in 1747, he said even now, though commissions composed of the ablest men of the land have sat and reported on Franklin's work in England, France, and nearly every civilised nation, the public generally remains not only

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ignorant of the use of lightning-conductors, but absolutely indifferent to their erection; and, if they are erected, certainly careless of their proper maintenance. I found in a church not very far from here the conductor leaded into a tombstone, and in a neighbouring cathedral the conductor only a few inches in the ground, so that I could draw it out with my hand. Although I called the attention of the proper authorities to the absolute danger of the state of affairs, they remained in the same condition for years. Wren's beautiful steeple in Fleet Street, St. Bride's, was well-nigh destroyed by lightning in 1764. A lightning-rod was fixed, but so imperfectly that it was again struck. In July last (1887) it was damaged because the conductor had been neglected, and had lost its efficiency. Lightning-conductors, if properly erected, duly maintained, and periodically inspected, are an absolute source of safety; but if erected by the village blacksmith, maintained by the economical churchwarden, and never inspected at all, a loud report will some day be heard, and the beautiful steeple will convert the churchyard into a new geological formation. The network of telegraph wires all over the country is peculiarly subject to the effects of atmospheric electricity, but we have completely mastered the vagaries of lightning discharges in our apparatus and cables. Accidents are now very few and far between. The art of transmitting intelligence to a distance beyond the reach of the ear and the eye, by the instantaneous effects of electricity, had been the dream of the philosopher for nearly a century, when in 1837 it was rendered a practical success by the commercial and far-sighted energy of Cooke, and the scientific knowledge and inventive genius of Wheatstone.

Having explained in detail the perfection with which electricity had been applied to the purposes of the telegraph and the telephone, and the important part these played in the present economy of the world, he said:—Electric lighting has become popular, not alone from the beauty of the light itself, but from its great hygienic qualities in maintaining the purity and coolness of the air we breathe. The electric light need not be more brilliant than gas, but it must be more healthy. It need not be cooler than a wax candle, but it must be brighter, steadier, and more pleasant to the eye. In fact, it can be rendered the most perfect artificial illuminant at our disposal, for it can illumine a room without being seen directly by the eye; it can be made absolutely steady and uniform without irritating the retina; it does not poison the air by carbonic acid and carbonic oxide, or dirty the decorations by depositing unconsumed carbon; it does not destroy books or articles of *virtu*

and art by forming water which absorbs sulphur acids; and it does not unduly heat the room. In the Post Office Central Savings Bank in London it has been found, after two years' experience of electric lighting, that the average amount of absences from illness has been diminished by about two days a year for each person on the staff. This is equivalent to a gain to the service of the time of about eight clerks in that department alone. Taking the cost at the overtime rate only, this would mean a saving in salaries of about 640*l.* a year. The cost of the installation of the electric light was 3,349*l.*, and the annual cost of working 700*l.* per annum—say a total annual cost of 1,034*l.* The cost of the gas consumed for lighting purposes was about 700*l.* a year, so that on the whole there was a direct saving of something like 266*l.* a year to the Government, besides the material advantage of the better work of the staff resulting from the improved atmospheric conditions under which their work is done. Though the electric light was discovered by Davy in 1810, it was not until 1844 that it was introduced into our scientific laboratories by Foucault; it was not until 1878 that Jablockhoff and Brush showed how to light up our streets effectually and practically; it was not until 1881 that Edison and Swan showed how our homes could be illuminated softly and perfectly. Unpreparedness for such a revolution produced a perfect panic among gas proprietors; inexperience in the use of powerful electric currents resulted in frequent failure and danger; speculation in financial bubbles transferred much gold from the pockets of the weak to the coffers of the unscrupulous; hasty legislation in 1882 restricted the operations of the cautious and the wise; and the prejudice arising from all these causes has, perhaps fortunately, delayed the general introduction of electricity; but now legislation has been improved, experience has been gained, confidence is being restored, and in this beautiful town of Bath fifty streets are about to be lighted, and we see everywhere around and about us in our English homes the pure glow lamp replacing filthy gas and stinking oil. The economical distribution of the electric current over large areas is annually receiving a fresh impetus.

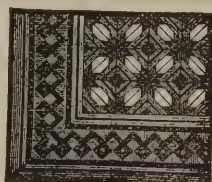
The expensive systems defined in the Act of Parliament of 1882 have entirely disappeared. Hopkinson in England and Edison in America showed how a third wire reduced the weight of copper needed by 66 per cent. Gaulard and Gibbs in 1882 showed how the conversion of alternate currents of high electro-motive force to currents of low electromotive force, by simple induction coils, would enable a mere telegraph wire to

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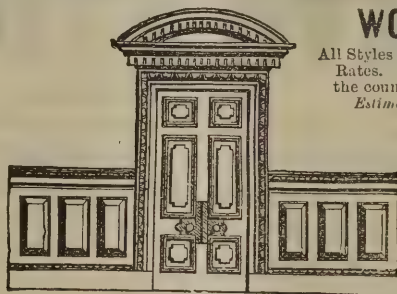


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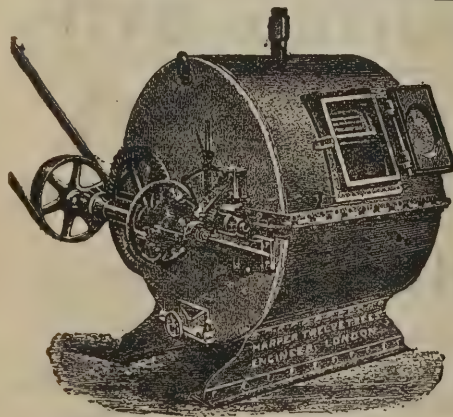
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convey sufficient electricity to light a distant neighbourhood economically and efficiently. Lane-Fox in 1879 showed how the same thing could be done by secondary batteries; and Planté, Faure, Sellon and Parker have done much to prove how batteries can be made to solve the problem of storage; while King and Edmunds have shown how the distribution by secondary batteries can be done as economically as by secondary generators.


The Grosvenor Gallery Company in London have proved the practicability of the secondary generator principle by nightly supplying 24,000 glow lamps scattered over a very wide area of London. The glow lamp of Edison, which in 1881 required five watts per candle, has been so far improved that it now consumes but 2½ watts per candle. The dynamo, which in the same year weighed 50,000 lbs., absorbed 150-horse power, and cost 4,000*l.* for 1,000 lamps, now weighs 14,000 lbs., absorbs 110-horse power, and costs 500*l.* for the same production of external energy; in other words, its commercial output has been increased nearly six times, while its prime cost has been diminished eight times. The steam-engine has received equal attention. The economy of the electric light when steam is used depends almost entirely on the consumption of coal. With slow-speed low-pressure engines one kilowatt (1,000 watts, one 1·3-horse power) may consume 12 lbs. of coal per hour; in high-speed high-pressure triple-expansion condensing engines it need not consume more than 1 lb. of coal per hour. Willans and Robinson have actually delivered from a dynamo one kilowatt by the consumption of 2 lbs. of coal per hour, or by the condensation of 20 lbs. of steam. There is a great tendency to use small economical direct-acting engines in place of large expensive engines, which waste power in counter-shafting and belts. Between the energy developed in the furnace in the form of heat, and that distributed in our rooms in the form of light, there have been too many points of waste in the intermediate operations. These have now been eliminated or reduced. Electricity can now be produced by steam at 3*d.* per kilowatt per hour. The kilowatt hour is the Board of Trade unit as defined by the Act of 1882, for which the consumer of electric energy has to pay. Its production by gas engines costs 6*d.* per kilowatt hour, while by primary batteries it costs 3*s.* per kilowatt hour. The Grosvenor Gallery Company supply currents at 7½*d.* per kilowatt hour; a 20 candle-power lamp consuming 3 watts per candle, and burning 1,200 hours per annum, expends 82,000 watt hours or 82 kilowatt hours, and it costs at 7½*d.* per unit, 50*s.* per annum. If the

electricity be produced on the premises, as is the case in the Post Office, in the House of Commons, and in many large places, it would cost 20*s.* 6*d.* per annum. I have found from a general average under the same circumstances and for the same light in the General Post Office in London, that an electric glow lamp costs 22*s.* and a gas lamp 18*s.* per annum. The actual cost of the production of one candle-light per annum of 1,000 hours is as follows:—Sperm candles, 8*s.* 6*d.*; gas (London), 1*s.* 3*d.*; oil (petroleum), 8*d.*; electricity (glow), 9*d.*; electricity (arc), 1½*d.* The greatest development of the electric light has taken place on board ship. Our Admiralty have been foremost in this work. All our warships are gradually receiving their equipment. Our ocean-going passenger ships are also now so illumined, and perhaps it is here that the comfort, security, and true blessedness of the electric light are experienced. Railway trains are also being rapidly fitted up. The express trains to Brighton have for a long time been so lighted, and now several northern railways, notably the Midland, are following suit. Our rocky coasts and prominent landfalls are also having their lighthouses fitted with brilliant arc lamps, the last being St. Catherine's Point, on the Isle of Wight, where 60,000 candles throw their bright beams over the English Channel, causing many an anxious mariner to proceed on his way rejoicing.


Fontaine showed in Vienna, in 1873, that a dynamo was reversible—that is, if rotated by the energy of a moving machine, it would produce electric currents; or, if rotated by electric currents, it would move machinery. An electric current is one form of energy. If we have at one place the energy of falling water, we can, by means of a turbine and a dynamo, convert a certain portion of the energy of this falling water into an electric current. We transmit this current through proper conductors to any other place we like, and we can again, by means of a motor, convert the energy of the current into mechanical energy to do work by moving machinery, drawing tramcars, or in any other way. We can in this way transmit and utilise 50 per cent. of the energy of the falling water wherever we like. The waste forces of nature are thus within our reach. The waterfalls of Wales may be utilised in London; the torrents of the Highlands may work the tramways of Edinburgh; the wasted horse-power of Niagara may light up New York. The falls of Bushmills actually do work the tramway from Portrush to the Giant's Causeway, and those of Bessbrook the line from Newry to Bessbrook. The practicability of the transmission of energy by currents is assured,

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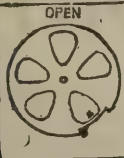
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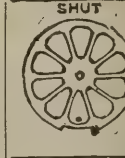
**H. W. COOPER, Sole Inventor of the Circular and Sliding Ventilators; also of the Metal Casements and Hopper Ventilators.**

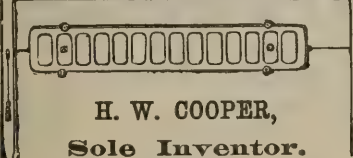


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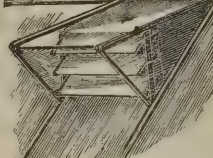


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and the economy of doing this is a mere matter of calculation. It is a question of the relative cost of the transmission of fuel in bulk, or of the transmission of energy by wire. Coal can be delivered in London for 12s. per ton. The mere cost of the up-keep of a wire between Wales and London to deliver the same amount of energy would exceed this sum tenfold. For long distances the transmission of energy is at present out of the question. There can be no doubt, however, that for many purposes within limited areas the transmission of energy by electricity would be very economical and effective. Pumps are worked in the mines of the Forest of Dean; cranes are moved in the works of Easton & Anderson at Erith; lifts are raised in banks in London; water is pumped up from wells to cisterns in the house of Sir Francis Truscott, near East Grinstead; ventilation is effected and temperature lowered in collieries; goods, minerals, and fuel can be transmitted by telpheage. The transmission of power by electricity is thus within the range of practice. It can be distributed during the day by the same mains which supply currents for light by night. Small industries, such as printing, watchmaking, tailoring, and bootmaking, can be cheaply supplied with power. It is thus brought into direct competition with the distribution of power by steam as in America, or by air-pressure as in Paris, or by high-pressure water as in London; and the relative advantages and economies of each system are simple questions of calculation. When that evil day arrives that our supply of natural fuel ceases, then we may look to electricity to bring to our aid the waste energies of nature—the heat of the sun, the tidal wave of the ocean, the flowing river, the roaring falls, and the raging storm. There is a mode of transport which is likely to create a revolution in the method of working tramways. A tramcar carries a set of accumulators which supplies a current to work a motor geared to a pair of wheels of the car. The weight, price, day's work, and life of the accumulator is curiously the same as the weight, price, day's work, and life of horse-flesh; but the cost of maintenance, the liability to accident, and the chances of failure are much less. Although very great improvements in batteries have been made, and they are now really practical things, sufficient experience in tramcar working has not yet been obtained to say that we have reached the proper accumulator. Nor have we yet acquired the best motor and mode of gearing; but very active experiments are being carried out in various countries, and nothing can prevent their ultimate success.

(To be continued.)

## THE TIBER WORKS, ROME.

THE embankment of the Tiber and other works connected with the same, along that portion of the river which runs through the city are still, according to the latest report of the Consul at Rome, proceeding regularly. The embankment on both sides of the lower portion of the river, from the church of San Giovanni dei Fiorentini down to the Marmorata, as well as the relative bridges, are in an advanced stage of completion. From the annual report presented to the Italian Parliament in November 1887, we learn that, thanks to the powerful means at the disposal of the contractors (Messrs. Zschokke & Terrier), the laying down of the foundations of the embankment has not met with serious difficulties. In laying down these foundations, the system of metallic caissons, by means of compressed air, is still adopted, and it has given the most satisfactory results. For the construction of the new Ponte Cestio six caissons were let down, three of which on the right-hand side of the bridge, measuring in all 49 mètres in length, and other three on the left, measuring 53 mètres 30 centims. The middle caisson, supporting the right side heading, reached a depth of 10 mètres 40 centims. below the ordinary water-mark, and the lateral ones reached the depth of 9 mètres 14 centims. The middle caisson on the left side reached a depth of 10 mètres 54 centims. and the lateral ones 8 mètres 13 centims. As regards the mode of constructing the new bridge which has to replace the present Ponte Cestio, serious opposition was raised by the Archaeological Commission, and ultimately it was arranged to demolish it completely, but to undo carefully the middle arch, so as to have it put up again on the new foundations, which will be much more solid than the existing ones. The bridge is therefore to be partly reconstructed with the old materials, and it is to maintain, or record, its present shape in all its details. The digging up of the river-bed and clearing away the old walls existing on it have, contrary to what has been said on the subject of the embankment, presented great difficulties on account of the great quantity of mural blocks and substructures overturned or otherwise buried into the river, or of the existing old pilework. This part of the undertaking has not proceeded with sufficient speed to expect that it may be completed within the time fixed by the contract. The foundations of the two supporting piers of the Ponte Margherita, which is to cross the river on a line with the Piazza del Popolo, reach a depth of 15 mètres below the ordinary water-mark. The foundations of the left-hand side heading reach 16 mètres 80 centims. in depth

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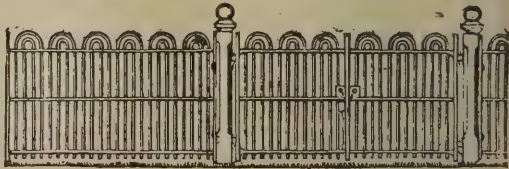
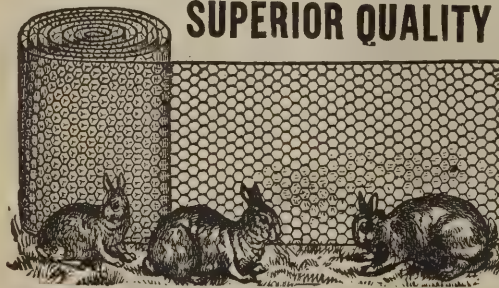
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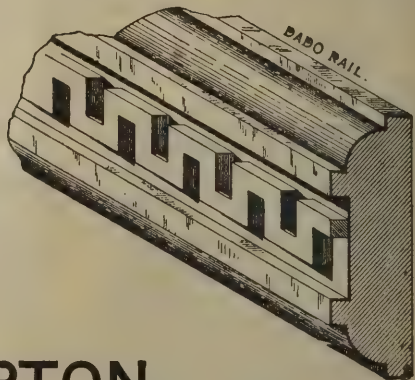


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A minor depth is considered sufficient on the right-hand side. The depth reached by the foundations of the right heading, and by those of the corresponding pier of the Ponte Umberto I., is 15 mètres 30 centims. The left heading of this bridge reached a depth of 16 mètres 15 centims., and the corresponding left pier 20 mètres 59 centims. The foundations of the central pier of the Ponte Garibaldi reached 15 mètres, and the headings of the bridge 14 mètres. Each of these three monumental bridges will have a width of 20 mètres between the two parapets.

#### REGISTRATION OF PLUMBERS.

THE Mayor of Stockton-on-Tees has fixed the 14th inst. for a public meeting in the Town Hall, Stockton, for the appointment of local representatives to join the District Council lately formed for the North of England, and Mr. J. Barkeley Smith, chairman of the Health Committee, Liverpool, has fixed the same date for the first meeting of the District Council for West Lancashire, Cheshire, and North Wales.

#### ARCHITECTS' COMPENDIUM AND COMPLETE CATALOGUE.

WE have been forwarded the specimen pages and prospectus of the third annual issue of the "Architects' Compendium," now preparing for the press, which gives promise of a work of great importance to architects and the manufacturers and merchants connected with the building trade. The plan of the work has been entirely revised, and several new features have been added which will increase its usefulness. We also notice that the "Complete Catalogue," which received the recommendation of a large number of architects of standing, has been merged in the "Compendium." Briefly, its contents will comprise a register of leading manufacturers and merchants, with telephone number and telegraphic address; a register of leading builders; a dictionary of manufacturers' specialties; a complete catalogue of detailed, illustrated, and priced particulars of goods; and also tables and other information for reference. The manufacturers who have taken space in the "Complete Catalogue" include many of the best-known names, and they

are inserting illustrative plates, lithographed designs, &c., which will add to the value and attractiveness of the work. A superior professional diary is to be published as a companion volume to the "Compendium."

#### LONDON WATER SUPPLY IN THE PAST.

THE exhumation not long ago of sundry wooden tubes or pipes in front of the new Law Courts in the Strand has drawn attention to some of the bygone conditions of the water supply of the metropolis. That wooden water pipes were also used in the provinces in past years is well known, the *Standard* says, and the records of the Hertford Corporation contain sundry entries of money paid for the construction and repair of such pipes during the sixteenth century. To lay down a cast-iron main for the conveyance of water would seem a very simple and obvious contrivance. Yet the history of the water supply shows that it has required a long course of experience to bring the mode of distribution to its present point of refinement. There has been the leaden age, the wooden age, for a brief period the stone age, and now at last the age of iron. It seems like a curious anticipation of the present schemes of Local Government and the possession of the metropolitan water supply by a municipal authority, that quite at the commencement of the thirteenth century the Corporation of London intercepted certain springs feeding the water-course known as the Tye-bourne, and gathered them into reservoirs, situated near Marylebone Lane. From this point the water was conducted in a 6-inch lead pipe to Charing Cross, along the Strand and Fleet Street, crossing the Fleet by means of the bridge which then existed at that spot, and proceeding up Ludgate Hill to Cheapside, where it was discharged into the conduit at the western end of that thoroughfare. This water was derived from the gravel beds forming the subsoil of Marylebone, and in those days was, doubtless, free from any dangerous contamination. The degree of hardness attaching to it would also prevent any risk of lead poisoning. At the present time a portion of the water supply of the metropolis is drawn from the gravel beds which underlie the banks of the Thames above London, and the water companies are endeavouring to increase the quantity taken from this source. These Marylebone Waterworks—if we may so term them—were the property of the Corporation, the owner of the land whence the springs issued being induced, under royal influence, to make a grant of

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the water to the civic authority. The lead pipe was paid for by certain merchants of Ghent, Bruges, and Antwerp, who received as a *quid pro quo* an exemption for a term of years from river dues and tolls on the goods they imported into London. The king took his share of the benefit by having a gratuitous supply of water for his stables, situated on what is now the north-east corner of Trafalgar Square. For many years the Corporation paid an annual visit of inspection to the Marylebone springs and reservoirs, celebrating the event by a dinner held in a banqueting-hall constructed on the arches by which the reservoirs were covered.

The supply of water to the people of London by means of conduits, utilising local springs, proved insufficient as the metropolis grew in size. Traces of this obsolete method are preserved in the names of Conduit Street, Lamb's Conduit Street and Conduit Vale. Towards the close of the sixteenth century recourse was had to the Thames, and as the main drainage works were then altogether out of the reckoning, the river at London Bridge was deemed a source sufficiently pure for a domestic water supply. This was the beginning of a new order of things and brought with it what may be called the age of wood. An enterprising Dutchman, named Peter Morrys, having obtained the consent of the Corporation, erected a tidal water-wheel under one of the arches of old London Bridge, by means of which he worked a force-pump, raising water from the Thames and driving it through leaden or wooden pipes laid in the streets, whence branch pipes conveyed water into the houses. This was fairly the germ of the system which now governs the metropolitan water supply. The tidal wheels under London Bridge were increased in number to meet the growing demand, until at last, in 1820, the works at the Bridge supplied as much as twenty-six million hogsheads of water during the year. As the London Bridge Waterworks came into operation soon after 1582, it is possible that wooden pipes three hundred years old are to be found in some parts of the city. But although the supply went as far west as Fleet Street, it is not certain that the Dutchman's wooden pipes extended beyond Temple Bar. When the London Bridge Waterworks were discontinued, consequent on the pulling down of the old bridge, the New River Company made an equitable arrangement with the proprietors, and absorbed the Dutchman's district into their own. The area served by the New River Company extends along Fleet Street into the Strand, and wooden pipes have been dug up in Fleet Street, apparently continuous with those opposite the new Law Courts.

It was not long after Peter Morrys set up his water-wheels that the New River project was started, in some degree introducing a competing supply. It was a great achievement to bring the pure spring waters from the neighbourhood of Ware, in Hertfordshire, into the reservoirs at Clerkenwell; but it was also felt to be a difficult matter to distribute the water to the various parts of the metropolis where it was needed. "This was done," says the record of the time, "with all possible diligence, by pipes of elme and lead, but for the most part elme, from which pipes many high streets and lanes within the City are plentifully served." This "plentiful serving" is exemplified by the circumstance that in 1616, in consideration of a certain sum to be paid yearly, Sir Hugh Myddelton granted to a citizen and his wife a lease for twenty-one years "of a pipe or quill of half-inch bore, for the service of their yarde and kitchine by means of two swan-necked cocks." Such a supply as could be obtained through a pipe "of the size of a goose-quill" was that which the king obtained from the Corporation in recognition of the royal assistance in getting a grant of the water at Marylebone. Perhaps the supply was constant, in which case it would excel the present intermittent system; and, when the water flows continuously, a goose-quill will yield a considerable quantity. In the foregoing lease granted by Hugh Myddelton the "quill" is specified as being half an inch in diameter, which shows that the term had a technical meaning when not otherwise expressed.

Some singular relics of the old water supply of London were shown in the International Health Exhibition at South Kensington in 1884. The New River Company sent a pail made out of an old wooden pipe dug up in Southampton Row, as also one of the actual pipes. The East London Company threw some light on the manufacture by exhibiting a set of cutters used in boring the wooden mains. These tools were said to be about a hundred years old. The Grand Junction Company sent a specimen of a wooden water main "as formerly in use in the London streets," dug up about seven years previously. The Southwark and Vauxhall Company exhibited some old wooden pipes and stop-valves taken out of the ground in Redcross Street, Southwark, and supposed to have been fixed about the year 1814—a somewhat late period. The West Middlesex Company sent specimens of stone pipes, "as used by the company until 1807 for supplying the water into the district." The same company also furnished specimens of the wooden pipes. They abandoned both stone and wood in 1807. Stone was tried as a substitute for wood in the hope that it would

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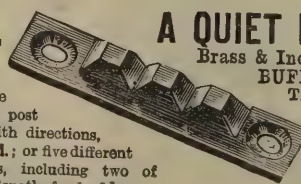
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prove less liable to leak. It probably proved the worst of the two, owing to the yielding of the joints under pressure. The West Middlesex Company appear to have entertained considerable hope at one time that stone pipes would answer, judging by the fact that they laid down a quantity in various parts of the district, the diameters ranging from 2 inches to 12 inches. The Hertford records show that wooden pipes were sometimes strengthened by means of iron hoops. Elm was used at Hertford, as in London, and the process of boring is mentioned. The date of 1814, when the Hertford Corporation resolved on using iron pipes instead of wooden ones, corresponds very closely to the time when the same change took place in London. The necessity of having mains of large diameter, and the general requirement for water at high pressure, would help to render wood an obsolete material. The East London Company laid iron pipes at the commencement of the present century, in lieu of the old wooden ones used by the Shadwell and West Ham Companies, the complaint being that the wooden mains "were totally inadequate to withstand the pressure"; but the cost of substituting iron for wooden pipes, together with the erection of some powerful pumping machinery, was felt as a heavy burden by the Southwark and Vauxhall Company about half a century ago.

#### THE DRAINAGE OF MANCHESTER.

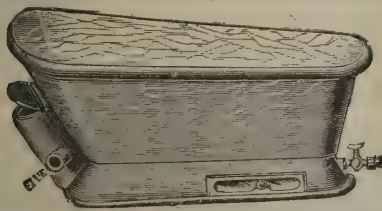
AN inquiry is being held by the Local Government Board, in regard of the application by the Manchester Corporation for sanction to borrow 490,000*l.* for purposes of sewerage and sewage disposal. The city surveyor, Mr. John Allison, on Tuesday gave the following details in the course of his evidence.

Mr. Allison said he was a member of the Institute of Civil Engineers, and had been the city surveyor for ten years. He had held similar appointments for twenty-two years, and had considerable experience of drainage works for the interception of sewage. While at Bradford he had ample opportunities of judging of the precipitation process. When he came to Manchester the sewage question was beginning to be discussed. In 1880, along with the Rivers Committee of the Corporation, he visited nearly all the principal sewage works in England. In 1884 they revisited some of the systems which seemed best adapted to their requirements, having first of all satisfied themselves that an irrigation scheme was impossible for the district. After full consideration, the committee were unanimous in

agreeing to adopt almost a facsimile of the works at Leeds. The Leeds scheme was for precipitation works at the outfall. The Manchester scheme, as now before the Commissioner, was first of all a gravitation scheme. No pumping would be required at all throughout the city. The only pumping in the whole scheme would be for lifting some of the effluent out of the effluent well and also for pumping up the sludge. The sewage proper would not be pumped at all. The general outline of the present scheme was that of an intercepting sewer. Manchester at the present time was drained throughout the entire area by outfall sewers gravitating towards the three valleys—the Medlock valley, the Irk valley, and the Irwell valley. The sewers would be laid with a view to making use of the natural conformation of the ground. For the purposes of the scheme, the city was divided into drainage areas, to which a prospective population was assigned—that was to say, the population when the area was built upon. Giving a few general statistics, he said the area of the city was 5,929 acres, and the present population 378,000. The average rainfall was about 35 inches. For an average of 111 days, the rainfall did not exceed  $\frac{1}{8}$  inch; for 39 days the rainfall did not exceed  $\frac{1}{4}$  inch, and there were 35 days in which the rainfall exceeded  $\frac{1}{4}$  inch. That left an average of 186 days on which no rain fell. The average had been taken over a period of five years. The present water supply for the city was 13 gallons per head for domestic purposes, and 7 gallons per head for trade purposes, making a total of 20 gallons per day per head. Manchester was not a water-closet town. It had 18,800 water-closets, representing a population of 94,000. Of dry earth-closets there were 66,000, and of ashpits 4,000. There were no cesspools. Very few of the manufactories were connected with the sewers. The witness described in detail the drainage areas and the intercepting sewers it was proposed to construct within the city. Such sewers as were more than 18 feet deep would be made in tunnel to interfere as little as possible with street traffic. In Stretford Road the outfall sewer would be made in tunnel. The sewers were calculated on a scale that would be sufficient for all time. They would provide for a population within the city of half a million. When the Thirlmere water scheme came into operation, as it probably would in three or four years, the people would, no doubt, gradually become educated into using more water than they did at present. The average allowance at present was about 20 gallons per head per day, and the scheme was based on the notion that it might be increased to 40 or 44 gallons. Pro-

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vision was also made to carry off half an inch of rainfall in twenty-four hours. The two large main sewers would be able to pass 100,257,000 gallons in twenty-four hours, or 11,139 cubic feet per minute. From the city boundary the sewage would be taken along Stretford in an outfall sewer 14 feet by 10 feet 6 inches at a gradient of one in 2,640. Running three-quarters full, it would pass 19,588 cubic feet per minute. Running full bore, it would pass 21,849 cubic feet per minute. Opposite the Blind Asylum there would be a storm overflow, communicating with the river, and eventually with the Ship Canal. After this point the outfall sewer was reduced to 10 feet in diameter. Another storm overflow was provided at Throstle Nest. The sewage works at Davyhulme would be constructed on a scale to meet no more than the present needs of the city, with a slight margin. The population at present was 378,000, using a water supply of 20 gallons per head per day, and the works would be constructed to meet the wants of a population of 400,000, using 25 gallons of water per head per day. It would be very easy to increase the capacity of the works as was found necessary. A series of twenty tanks would be constructed, each tank 100 feet long and 60 feet wide, 7 feet deep at one side and 5 feet at the other. Mr. Allison explained the treatment of the sewage on its arrival at the works and its subsequent precipitation in the tanks. The sludge on being taken out of the tanks would be dried on beds of land outside. The daily bulk would be about 120 tons, and this would in about four days dry down to 25 tons, in which there would still be 46·9 of moisture. It was anticipated that there would be no difficulty in disposing of the dried sludge to farmers. In Leeds the demand for the material was greater than the supply. About 95 acres of land had been purchased for the sewage works. The tanks would occupy about three acres, and the sludge beds about two acres. Mr. Allison described the disposal of the effluent water, which it is proposed to pass over filtration beds before it sets out for the Irwell. When the volume of sewage was under ten million gallons in the twenty-four hours it would pass through the tanks, but would go into the river without passing through the filter beds. When the volume rose above 40 million gallons it would go straight into the river without any treatment at all. So large an admixture of flood water as was implied in these circumstances would be taken as effecting the object aimed at by the treatment at the works. He had visited Leeds, Coventry, and other places where the proposed system was in operation, and his experience was that no nuisance was created. There was no smell at all

from the works. In regard to the site of the proposed works at Davyhulme, there were no houses within 400 or 500 yards. He could not see any respect in which the works would be a nuisance. The scheme was not a scheme for flood water as well as sewage. The total cost he estimated at 465,358*l*., including the cost of the land.

#### DEVELOPMENT OF TRAFFIC.

UNDER the title of "A Few Arguments in Favour of Light or Road Railways," Mr. T. S. Sellon read a paper at a meeting of the British Association. He said that there was no reason why the present tramway system, familiar in most of our principal towns, could not be made (with some modifications) of exceptional value as feeders to the trunk lines, and as a means of transit for every description of goods and merchandise as well as passengers. By utilising the sometimes considerable waste, so often met with along the side of our country roads, cheap and efficient feeders could be constructed, thereby saving the cost of land purchase, or the heavy cost of maintenance if constructed on the road. A line which had been constructed on this principle, and which had been working for the last eighteen months, was mentioned as proving how increased facilities made increased traffic. It carried the entire population of the whole district once a week, besides dealing with the whole of the cartage and delivery of goods to and from the London and North-Western Railway, with which the line was connected, as well as all the parcels and mails. Besides the advantages proved by the large patronage it received, the property in the district since its opening had risen 20 per cent. in value, and houses which had long been in want of tenants were now all occupied. As the object of this class of railway was to carry heavy goods and other merchandise that would otherwise be drawn along the road, it was clear that there must be a great saving in the wear and tear of the same, as well as a material relief to the road rates which, in some country districts, were a great burden. Being a tramway, the working expenses, as compared with railways, were very small, owing to the absence of stations and station officials, signals, and telegraph. The author was strongly against the construction of this class of light railway to any other gauge but that of the line it fed, as he affirmed that the plea of economy could not be maintained, and that one of the chief causes of the failure of the Irish Tramway Act, 1883, was the fact that the gauge

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To Mr. Grundy, 6 John Street, Bedford Row, W.C.

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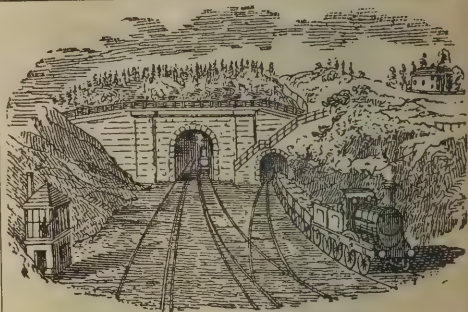
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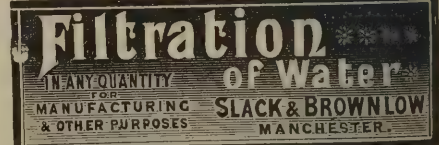
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was fixed at 3 feet, the fallacy of which had been demonstrated by the report of the late Royal Commission on Irish Public Works. He also pointed out the great necessity there was for the reform of Private Bill legislation, there being far too much expense in the introduction of a scheme, *i.e.*, prior to consideration, a mutilated Bill being often accepted by the promoters in consideration of the money already expended. In these days of progress landowners were urged to thoroughly examine the merits of a scheme before they threw away their money in opposition, as by arrangement with promoters all their objections might easily be overcome. By a comparison between the ordinary service of a branch line and the ordinary service of a light railway, it was demonstrated by the actual returns of the latter that it was to the interest of all railway managers and railway shareholders to give every facility for the construction of these feeders, which must largely increase the value of their properties.

#### DOCKS AND CANALS.

THE new Barry Docks, now approaching completion on the north shore of the Bristol Channel, were described by Mr. J. W. Barry, C.E., at the meeting of the British Association. These docks, he said, are situated about seven miles westward of Cardiff, between Barry Island and the mainland, and the approaches from the sea are very easy. Good anchorage exists eastward of the docks between Barry Island and Sully Island. The docks are, as is the case with other docks on the Bristol Channel, tidal, and thus can only be approached for a few hours at high water. The range of tide in the Bristol Channel is large; at Barry there is a range of 36 feet at ordinary springs and of 19½ feet at ordinary neaps. There is a depth of 25 feet of water at low water of spring tides within 700 yards of the entrance gates of the Barry Docks. The main object of the Barry Docks is for the shipment of South Wales coal, but it is expected that a considerable import trade will also be developed. The Barry Docks are connected with the coalfields by new railways about 27 miles in length which are nearly finished. The entrance of the docks is on the east side of Barry Island, which protects it from westerly and south-westerly winds. Against other winds the entrance is protected by two breakwaters composed of rubble protected by 6-ton blocks of stone on the sea-slope. The waterway between the breakwaters is 350 feet, and the entrance is 485 yards within

the breakwater heads. A channel of that length is to be dredged to the entrance. The entrance is 80 feet wide, and has a pair of wrought-iron gates which will be opened and closed by direct-acting hydraulic cylinders; it gives access to the basin, which is 600 feet long and 500 feet wide, having an area of 7 acres. Beyond the basin is the dock, which is 3,400 feet long and 1,100 feet wide. This width is divided at the western end of the dock into two arms by a projecting mole. The water area of the dock is about 70 acres. A graving dock, 700 feet long and 100 feet wide, is being made at the north-east corner of the dock. Eastward of this is the timber pond of 24 acres, approached from the dock by a short canal. The total area of water in the dock, basin, and timber pond is upwards of 100 acres. The depth of water at the entrance is 38 feet at high-water spring tides, and 29 feet at high-water neap tides.

Mr. Lionel B. Wells, C.E., read a paper on the "Plant and Machinery in use on the Manchester Ship Canal," and stated that the plant for a contract of such magnitude, to be completed within a limited time, is necessarily great in quantity and of the most improved description. In addition to the usual locomotives, which already number eighty-seven, there are upwards of sixty steam-diggers of various models, some of which were referred to in detail and photographs shown; also new excavating machines were described, which, under the name of the French or German excavator, for each nation supplies its especial machine, have been for the first time introduced into this country. The action of the machine is that of a bucket-dredger, but instead of being water-borne it is worked on a railway. The excavations exceed a million and a quarter cubic yards a month, and the output is still increasing.

Mr. S. Lloyd, in a paper on an improved canal lift, referred to the antiquity of canal navigation and to the difficulties of working locks with a small water supply. He advocated the use of hydraulic lifts of an improved type. Three of these were in use—one in Cheshire, and two on the continent. In each case the boat was floated into a receptacle full of water, and was raised or lowered in it, the receptacle being supported by a ram fixed vertically beneath it. The method of transferring the boats from one level to another was rapid and economical.

A paper on the Panama Canal, by M. de Lesseps, was read at the meeting of the British Association by Mr. H. J. Mackinder, in the geographical section.

The canal, the author said, had an altitude of 100 mètres above sea level, and the work had been undertaken in the

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narrowest part of the American isthmus. The total length would be 74 kilomètres, 68 of which belonged to the canal, properly speaking, and six to the roadsteads. It would be 22 mètres wide, having a depth of water of  $8\frac{1}{4}$  mètres. It will be provisionally constructed with ten locks in order to be open for general navigation in 1890. After describing the manner in which ships coming from Europe would enter the canal and the various ports and points of interest they would pass *en route*, together with the geographical and physical aspect of the country, the paper showed that in November 1887 direct communication had been opened, by means of the excavated canal, 17 kilomètres from Colon on the Atlantic side and upwards of 8 kilomètres from Boca on the Pacific side. Since this period the work had been proceeded with on those portions of the canal in the direction of widening and deepening it. In April last the canal had attained its entire width from Port Christophe over a length of  $4\frac{1}{2}$  kilomètres. The depth, which had been obtained nearly up to 18 kilomètres, varied from a minimum of 5 mètres to a maximum of  $8\frac{1}{4}$  mètres. The provisional opening of the canal by locks, intended for the first months of 1890, would necessitate the excavation of 40 million mètres, ten millions of which were in hard material. During the six months between January 1 and June 30, 1888, the excavations had reached a total of 7,479,400 cubic mètres, which had exceeded, by nearly 100,000 cubic mètres per month the average which the contractors had to make during that time. The cutting of the Panama Canal, while it would prevent navigators undertaking the dangerous passage round Cape Horn or passing the Straits of Magellan, would equally benefit the shipowners and merchants, owing to the considerable diminution which would take place in the cost of assurance, and would shorten considerably the distances between the ports of the two hemispheres. In 1866 Admiral Davis, of the United States Navy, was directed by the Senate to estimate the total tonnage which would pass through the canal if it were finished, the value of the change of route, and the saving which would result; and he estimated that the total tonnage, according to the official reports, would be 3,094,070 tons; the value of the commerce would be 467,831,130 dols; the saving by the use of the canal on that amount would be 49,530,390 dols, and he estimated the tonnage using the canal in 1876 at 6,188,140 tons. The International Congress, which met at Paris in 1879 and decided the route of the canal, sent a special commission to report on the same subject. That commission estimated the tonnage which would pass through the canal in 1889 at  $7\frac{1}{2}$  million tons. It

was this calculation, giving receipts amounting to 112,500,000 frs., which had served as the basis of the constitution of La Compagnie Universelle du Canal Interocéanique. Since the assembly of the International Congress in 1879, these forecasts had been confirmed and enlarged. The author contended that there could be no doubt that in the future the working of the Panama Canal would be remunerative to the capital which had been employed in its execution. The interested adversaries of the universal work sought in vain to dispute the results, which certainly would be more considerable than those of the Suez Canal, because it would not be, like the Egyptian canal, exclusively accessible to steamships. All vessels from the first day would pass the Panama Canal and continue their navigation in the two oceans joined together by an artificial strait as was the case in the Mediterranean and the Red Sea. The Panama Canal would be open at first to navigation by means of locks, and its eventual transformation into a canal on the level would be carried out proportionally to maritime progress and the increase of receipts.

#### UTILISATION OF WATER SOURCES.

At the Congress of the British Association, Mr. J. Bailey Denton read a paper on "The Replenishment of the Underground Waters of the Permeable Formations of England."

The author, having long advocated, he said, with the late Sir John Rennie and others the storage of the surplus rainfall in reservoirs or lakes to be constructed in the higher tributary valleys of our river systems to maintain them in full service, invites attention to the capabilities existing of replenishing at the same time the subterranean supplies of the water-bearing strata by shafts to be sunk down to the line of their saturation. Of the 27 inches forming the mean average annual rainfall, about two-thirds, or 18 inches, are evaporated from the surface, while of the remaining third 4 inches serve to maintain the river system, and 5 inches pass away as floods and freshets. Instances are numerous in which the year's rainfall exceeds 30 inches, while they are very few in which it is less than 20 inches—about three times in twenty years. As the amount of evaporation is nearly a constant figure, and the quantity required to maintain effectually the river system necessarily remains the same under all conditions, the amount of flood or excess water greatly varies. It is sometimes double the average. On the few occasions when the rainfall

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does not reach 20 inches it is insufficient to satisfy the demands of the river system, and then the river becomes a borrower from the stored supply of the subterranean reservoirs. On such occasions the quantity of water flowing down the river to Kingston has been so reduced as not to reach 300 million gallons in twenty-four hours. The importance and bearing of this fact upon the proposal to replenish the subterranean supply will be appreciated when it is pointed out that the quantity of water supplied daily to the metropolis by the water companies has already exceeded 150 million gallons. Of these 150 millions the River Thames contributes 50 per cent., or 75 millions, which is a quarter of the quantity flowing past Kingston. The Lea furnishes 38 per cent., and deep chalk wells the remainder, or 12 per cent. The quality of deep well waters has become of late years more and more improved. Dr. Edward Frankland, in his classification of potable waters, places deep well waters only second to springs issuing from the outcrops of the same formations. To make good the loss of this superior water, the author proposes that whenever the water in the river rises above a certain datum height recognised as the gauge of its full service, the excess shall be diverted out of the river course on to filter-beds formed near at hand. The outlet from these filter-beds would be steined shafts or sumps sunk down to the water level beneath, and into them the filtered water would pass after it was freed from flocculent matter. The steined shafts would be made watertight, and sealed against all surface contamination.

"The Raiyān Project for the Storage of Nile Flood" was described by Mr. Cope Whitehouse, M.A. He said:—The project is one for impounding a part of the surplus flood of the Nile. A series of surveys show that the Wadi Raiyān is a depression 75 miles to the south-south-west of Cairo, communicating with the Nile Valley at +26 mètres, or a little below high Nile. Except at two narrow passes, it is bounded by precipitous limestone hills rising to +190 mètres. The bottom, of sand and clay overlaying rock, sinks to -46 mètres. A reservoir formed by putting this valley in communication with the Nile flood would have at +30 mètres a surface of 686 square kilomètres (250 square miles), or 686 million square mètres, and hold 20,559 million cubic mètres. At +20 mètres the surface is 550 million square mètres, and contents 14,876 million cubic mètres. It would yield (without pumping) a net 40 million cubic mètres per diem for 100 days, or about the average discharge of low Nile from March to July. It would practically double the summer (Sefi) irrigation of Egypt. The

works could be completed within one year, and the Wadi Lulu and Wadi Safir, being detached from the Wadi Raiyān, could be used as small reservoirs until the Raiyān Basin was available. It would require one season to fill the small basins, and three to fill the Raiyān reservoir.

#### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

12540. John Mason, for "Improvements in skylights, ventilators, &c." August 31, 1888.  
12552. Norman Knowles, for "Improvements in apparatus for automatically regulating the temperature of greenhouses and other buildings." August 31, 1888.  
12589. Henry William Joseph White, for "Improvements in window-fasteners, specially applicable to sashes, casements, doors, and for other similar purposes." (Complete specification.) September 1, 1888.  
12674. Herman Leisner, for "Improvements in gas regulators." September 3, 1888.  
12659. Henry Atkinson, for "Improved method of suspending and working window-sashes, doors, Venetian and other blinds, curtains, &c." September 3, 1888.  
12660. Thomas Bloomfield Secker, for "An invention for doors: the automatic door steadier." September 3, 1888.  
12668. John Taylor, for "A stench trap for sewers and sewage purposes." September 3, 1888.  
12708. Edward Nunan, for "Metal lathes for building purposes." September 3, 1888.  
12713. Thomas Sharples and Hugh Gardiner Graham, for "Improvements in the construction of fixing windows." September 4, 1888.  
12739. James Lamb Hancock, for "A novel method of means for creating up-draught in chimneys and for ventilating purposes." September 4, 1888.  
12771. Richard Cardwell Robinson, for "An improved construction of die for use in brick-making machines." September 4, 1888.

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12845. Frank William Allchin, for "Improvements in asphalte surfaces of roads, footpaths, floors, and a means for preparing the same." September 5, 1888.

12910. Edward Thomson, for "Improvements in the mode of laying wood floors in materials to be used therefor." September 6, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

10880. James Gush, for "Improvements in the method of fixing sliding windows in their casements to facilitate cleaning from the inside." July 27, 1888.

10960. Edw. Tippet Newton, for "Improvements in and relating to surveying and levelling instruments." July 28, 1888.

10990. Chas. Shrewbrooks, for "Improvements in the construction of roofing tiles." July 30, 1888.

11085. Richard Isaac Kiln and Charles Henry Kiln, for "Improvements in roller blinds and fittings therefor." July 31, 1888.

11335. Richard Hawkes, for "Improvements in apparatus for flushing water-closets and urinals and for such like purposes." August 4, 1888.

11603. Charles Darrah, for "Improvements in ventilators." August 11, 1888.

11609. Walter Jones, trading as Jones & Attwood, for "Improvements in or relating to the means of connecting or fixing lids or covers over manholes and analogous openings in metal cisterns and tanks and like receptacles or holders." August 11, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

14955. Daniel Thomas Bostel and William Bostel, for "Improvements in syphon flushing cisterns." November 2, 1887.

15071. John Wright, for "An improved chimney-top, applicable also as ventilator." November 5, 1887.

15203. John West, for "Improvements in water-waste flushing cisterns." November 8, 1887.

15065. Frederick Ransome, for "Improvements in the manufacture of cement." November 4, 1887.

10426. Ralph Waldo Emerson McIvor, for "Improvements in the production of white lead or carbonate of lead by the apparatus therefor." July 18, 1888.

11157. Heinrich Meidinger, for "Improvements in gas and similar stoves." August 1, 1888.

#### PATENTS SEALED, SEPTEMBER 7, 1888.

9074. W. H. Z. Cooper, for "Making, furnishing, and drying plain or socketed stoneware sanitary pipes or tubes." June 28, 1887.

10511. W. N. Swettenham, for "Automatic flushing apparatus for water-closets." July 28, 1887.

11508. R. R. Harrison, for "Improvements for opening, closing, and adjusting sashes, &c." August 24, 1887.

7774. J. S. Dunn, for "Improvements in stays for case-ments, fanlights, and the like." May 28, 1888.

1087. Salvatore Orlando, for "Improvements in steam-boiler or generators." January 24, 1888.

#### ABRIDGMENTS.

Paving, flooring, and roofing material." No. 13902. 1887. Robert Punchon, 8 St. Benet Place, Gracechurch Street, E.C. A composition in suitable proportions of granite, granulite, syenite, elvan, whin, Kentish rag, greenstone, tinstone, sandstone, freestone, trap, marble, limestone, iron slag, coke, burnt clay, slate, spar, quartz, bitumen, asphalte, ozokerit, resin, and oil. These are reduced to sand or finely divided particles, and mixed together with the aid of heat.

"Improved devices for facilitating the cleansing of drains." No. 13161. 1887. S. G. Huntley, 9 Duke Street, Adelphi, London. This invention relates to the cleansing out of drains.

*Claim 1.*—The combination of a frame, removable cover adapted to fit the same tightly, nozzle projecting from the bottom of the said frame, and removable cover adapted to close the mouth thereof, gas-tight and to be held down thereupon, as set forth.

"Improvements in wall-ties or band-iron." No. 16234. 1887. John Sheldon, 10 St. Augustine's Road, Birmingham.

*Claim 1.*—Making in the pieces or lengths of hoop iron or other strips of iron of which the wall-ties or band-iron are made a series of corrugations or undulations, crossing the said pieces or lengths at right angles to the longer sides of the said pieces or lengths, for the purposes and substantially as hereinbefore described and illustrated by the accompanying drawings.

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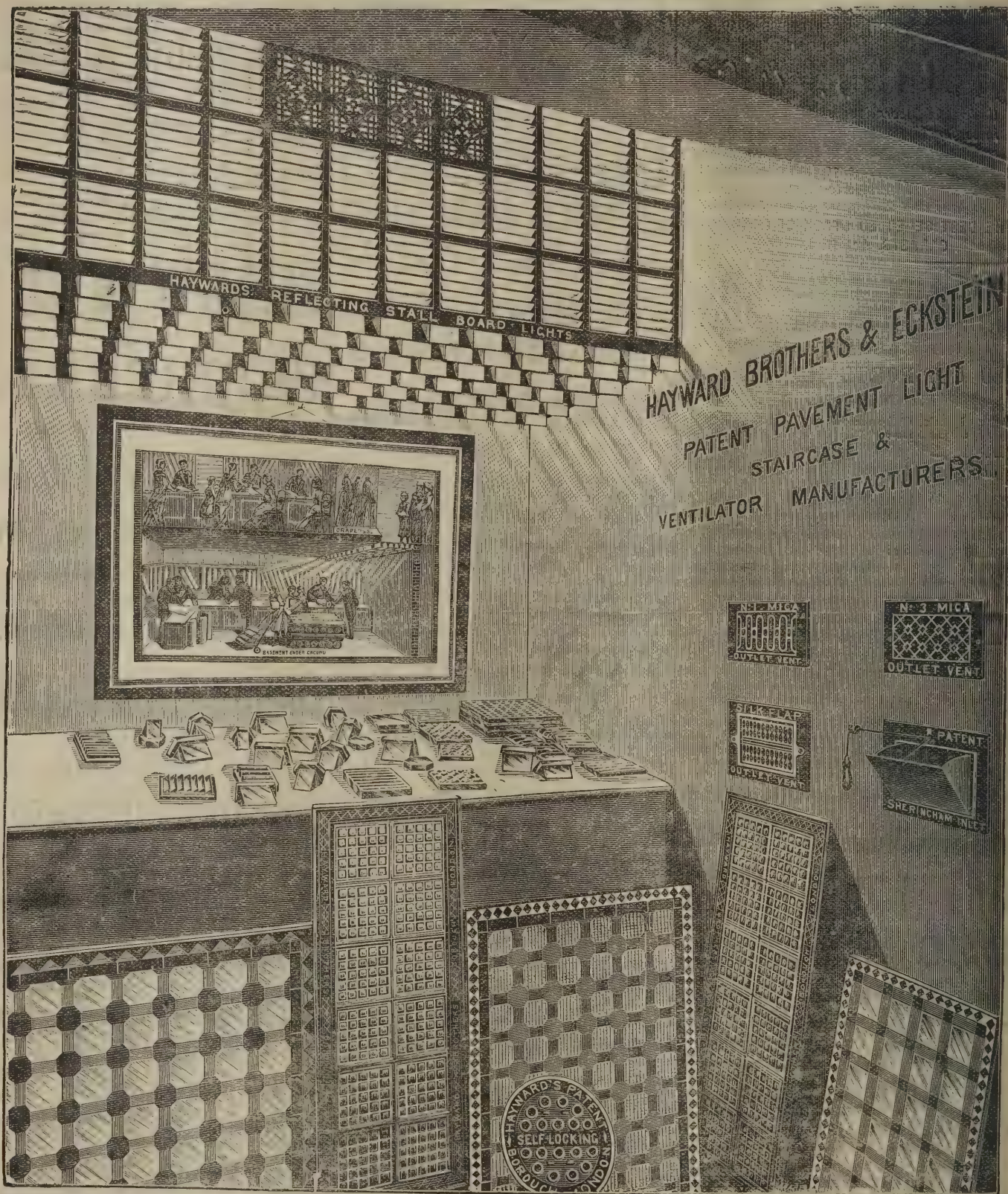


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# The Architect.

## THE WEEK.

A COMMITTEE has been formed for the purpose of preserving Kirkstall Abbey as a public monument. Mr. GEORGE GILL, who has undertaken the honorary secretaryship, says that a number of gentlemen, who desired that the abbey and grounds should be secured for the public, discussed the question together, and, knowing how difficult it would be for the Corporation to move with sufficient promptness in the matter, formed themselves into a committee, with power to add to their number, with the object of purchasing the estate, with the view of its being subsequently acquired by the town or settled under some other disinterested trust, under provisions that would secure the necessary steps being taken to stop the further destruction of the abbey, to provide for its protection and maintenance in future, and to insure the dedication of the abbey and grounds to the use and enjoyment of the public for ever. The committee has opened negotiations for the purchase of the estate, and one of its members has engaged to advance the necessary money if terms of purchase are agreed on.

A PROPOSAL has been made to place statues of WALLACE and BRUCE, the two Scottish heroes, in Edinburgh. A public competition, it appears, will be resorted to as a means of obtaining a pick out of the ranks of sculptors, and it is suggested that no premiums should be bestowed. No doubt the sub-committee of the Edinburgh Town Council consider their little economies will be a pleasing offering to the memory of the departed heroes. A site, it is thought, will be found for the statues on the Prince's Street Esplanade, and the cost of the statues, it is presumed, will be about 3,000*l*.

MUSEUM education has been much in favour of late years, and an exact return of the increased number of such centres of education would be interesting. Now, however, it appears that, though we have the museums, there is something still wanting before they will fulfil the purposes of instruction. Many suggestions are put forward. Exhaustive penny catalogues, "full of interesting descriptive notes," should be published; popular lectures, aided by a magic lantern—such are some of the suggestions. No doubt, if funds are forthcoming to remunerate lecturers, plenty of professors will also be forthcoming. But the idea that seems to have been in the minds of those who advocate the establishment of museums, is that professors and teachers in technical schools and colleges neither can nor are supposed to carry museums in their pockets, and that students who have gone through any training at all will know how to utilise the museum without carrying a professor there with them, so long as the objects are not locked up in the cellars, at any rate. There is no reason whatever why proper arrangement and classification of objects should not be insisted on in all museums, and also a simple catalogue. But the catalogue, to be of use, must nearly confine itself to giving the name and the number of the object. And professors might do a useful work in writing essays, which they might even enlarge into volumes. This would be for use in the college or other libraries, and form a part of the training, qualifying students to use a museum in the way that is most helpful.

THE controversy on the restoration of Cossey Church has not thrown any particular light on the question of restoration of historical buildings. Restorations, putting aside the thought whether they are *bona-fide* works needed for preservation, or, on the other hand, quite manifest works of vandalism, have been, and are, continuously in progress, and will be. Within the last few days the wish has been expressed that Kirkstall Abbey may be restored as the cathedral of a future Bishop of Leeds. The idea smacks certainly of destruction, and nothing could satisfy the inhabitants of the British Islands so much as seeing the ruins preserved in their present state as public property. But it is quite possible when a new cathedral is to be built anywhere to design a Kirkstall Abbey, or any other historical

building, quite as accurately as a Kirkstall Abbey restoration could be made of the ruin. For one ruin, however, there are hundreds of the old historical buildings—churches, for instance—that are in use, and that have necessarily to be restored unless the country is to be turned into a museum of ancient buildings. And it is just here where the difficulty in restoration lies. No good can be done by trying to persuade the inmates of a house that the roof is not rotten when they know it is. No attempt has been made to recognise the weight of an important point in Lord GRIMTHORPE'S indictment, or contradict it, that the "preserved" system of the Society for Ancient Buildings has, in certain cases, resulted in destruction. The public cannot have faith in their instructors unless they are practical as well as theoretical. Learned societies live often chiefly on the prestige acquired by writing letters, issuing circulars, speech-making, &c. The Society of Antiquaries has a list of rules, and the Institute of Architects, as we are reminded this week, has its list of rules for the guidance of restorers. But these precious pearls of wisdom are likely to be useless unless the framers can show that a falling house will be kept from falling by a coat of paint. When a restoration is proposed, the lovers of antiquity have got themselves to thank if the public think they would sooner err on the side of destruction from repairs than destruction by restoration. *In medio tutissimus ibis* is an old world truth, and to have influence, societies as well as individuals must be practical.

THE subject of Stirling Castle was brought up this week at the meeting of the Town Council, and a motion passed that, as the Government authorities who have charge of the buildings had from time to time been making alterations and thereby destroying and defacing the antiquarian appearance of the castle, it should be considered whether action might not be taken with a view of preventing any further destruction or defacement. In support of the motion it was alleged that the old Parliament House had been turned into a canteen, and the armoury, which contained ancient Scottish weapons, had been taken away. It was also agreed that further action should be taken to secure that the public should have access to the places of interest in the castle. The town authorities have done well in looking to the interests of what concerns their town, and with representations made in the proper quarter there is no doubt they will succeed. The term "Government authorities" is an elastic one, and Government often does not know all that is done by its zealous subordinates.

A COMPETITION for a church which is proposed to be built at Birkdale Common has just been decided. The competition was a limited one, and the promoters had been able to secure the services of Mr. EWAN CHRISTIAN to assist them in the selection by acting as assessor. The decision of the building committee has resulted in the adoption of the designs of Mr. J. FRANCIS DOYLE, of Liverpool. The church is intended to furnish accommodation for six hundred worshippers.

THE annual report of the chief surveyor for the Hackney District Board of Works, Mr. JAMES LOVEGROVE, has a reference to carriageway paving. There cannot, it states, be two opinions as to the longer wear of granite paving than of wood, while wood is far more durable and much cheaper than macadam. The extra cost of maintaining wood paving as compared with granite is to a considerable extent met by the reduced first cost, while wood has the great compensating advantage of being so much less noisy than either granite paving or macadam. Granite 4 by 4 inch cubes would be far cheaper than macadam. Granite-paved roads have, however, the drawbacks of being noisy and slippery. The macadam requires renewal in from one to six years according to the traffic, and the extra cost of clearing the mud and dust is considerable. The broken granite margins alongside the tramways are very costly to maintain. The repairs now carried on with the 2½-inch broken irregular stones under the steam-roller quickly work away from the tramway paving, and the constant feeding involves an outlay which in a few years far exceeds the cost of proper paving.



### THE TRIENNIAL EXHIBITION AT ANTWERP.—II.

IT is evident from the foreign departments of the Antwerp Exhibition that in Germany, Holland, and France a fine picture does not necessarily obtain a purchaser on its first appearance. Several of the paintings in the galleries have gained commendation before now, but they are still on the hands of their authors. One of the most interesting of these is the *Scellement du Saint Tombeau*, by ALBERT BAUR, of Düsseldorf, which was suggested by the passage in Scripture describing the sealing of the tomb of CHRIST. The door of the sepulchre in the rock is closed, and the mark fixed by the priests and Pharisees takes the form of two strips of linen placed crosswise, with seals at the extremities. There is a contrast in the expression of the faces, ranging from the scepticism of the priests to the grief of the disciples. MAGDALEN is apart, and is being consoled by one of the MARYS. In the foreground and at a lower level than the tomb stand the Roman soldiers, with a few people who have come through curiosity or sympathy. In no city are the canons of painting for religious subjects more rigorous than in Düsseldorf, but M. BAUR boldly departs from them. That the figures are well modelled is not surprising, for the Germans are strong in draughtsmanship, but we see also an exceptional depth and harmony in the colouring. Yet this fine picture, which would grace the walls of any Christian church or a public gallery, is still in the market. Unless we are mistaken, M. BECKMANN'S *Luther at the Diet of Worms* is of still older date. The figures are of heroic size, and denote a vigorous hand, and, from the arrangement, the eye is attracted by the courageous monk in his dark robe, rather than by the gorgeous bishops, or the still more gorgeous grandees. This is essentially a monumental work, and at one time would have excited enthusiasm wherever the Reformation became a power. If there are pictures in the galleries which seem to have been intended for public buildings, but have failed to attain that distinction, as compensation we also find works which are more successful, since they are lent by Governments, and they must impart an interest to the Exhibition for English eyes, as works which are the result of public commission are unknown among us. One of these is M. ARPAD FESZTI'S *Golgotha*, which comes from the Musée National of Buda-Pesth. The crosses represented are of the T-form, and are so short that the feet of CHRIST and the two thieves almost touch the ground. This treatment becomes the more remarkable when seen in a country like Belgium, where great artists have perpetuated lofty crosses in their pictures. M. FESZTI represents the place of execution under the darkness which overspread the land, and this treatment seems far more fitting for the subject than the fierce light which illuminates the pictures of the *Crucifixion* by RUBENS and his followers. The disciples appear as very humble men poorly clad, and the work is one of the most natural and yet poetic illustrations of scriptural events. It shows also how far art has advanced in the East of Europe. From the same museum comes a subject of a very different class, viz. the *Bacchante* of M. JULES BENCZUR, which is a capital piece of flesh-painting, and with less obtrusiveness than is found in French works; a historical picture by M. SZÉKELY, representing the discovery of the body of King LOUIS II. in 1626; besides works in other departments. Whatever may be the shortcomings of the Austrian system of government, neglect of art cannot be reckoned among them.

The Galerie Royale et Nationale of Berlin contributes a still larger quantity of paintings. Militarism is flattered by portraits of commanders, such as Herr JANSSEN'S *Field-Marshal von Bittenfeld*, a realisation of a strict disciplinarian; but art and scholarship have also their representatives, among others, RANKE, the historian, and LUDWIG RICHTER. Landscapes, as well as figure-paintings, are under the patronage of the Government of Prussia, and whatever may be the subject the influence of military rule is evident. Everything seen is as exact as a line of soldiers on parade. Take, for example, the *Paysage Alpestre*, by the Comte VON HARRACH. The rocks could hardly be more accurate and rigid in a photograph. The light and shade are in proportions that seem to be calculated. The smuggler or poacher who is wounded to death lies on the ground in the most

effective spot, and the scale is determined by a figure in the foreground, who overhauls somebody's luggage, in which every article is depicted with fidelity. But in spite of the industry seen throughout, the picture is not satisfactory. It suggests that the figures as well as the surroundings stood still until the painter completed his work. In M. OTTO KIRBERG'S *Victim of the Sea* the same cold-blooded sort of narration is apparent. The drowned sailor appears lying on the floor of a room with gaily painted cupboards. The sorrow of the wife and the surprise of the spectators are put on canvas with a regularity that could not be surpassed in the official report on the subject, but we defy any spectator to be moved by the picture, and indeed one gladly turns attention to the painted woodwork of the background. M. HOFF'S *Baptism of a Posthumous Child* is another example of the peculiarities of Prussian art. The pastor might be a young and zealous corporal, and the mother and her friends are as subdued as so many recruits. Dresden at one time could turn out works that recalled beings with flesh and blood. M. JULIUS SCHOLTZ'S *Volontaires de 1813* is not of that class. The crowds who come forward to enrol themselves all contrive to keep their enthusiasm under control. Every man is well brushed and combed, but one can hardly imagine any spontaneity in the movement. Yet all the figures are as faultless in their way as the cast-iron architecture of Berlin. A similar spirit animates the landscapes. Is there no philosopher who will explain why Austrians and Hungarians, Dutchmen, Frenchmen and Belgians, or, in other words, why all the neighbours of Germany can paint figures that seem endowed with life, and which reveal the delight of the artists in the exercise of their skill, whilst in those portions especially of the new empire which are under the influence of power, no more than a mechanical sort of talent can be attained? It is only necessary to compare the portrait of MOLTKE, the strategist, with the astonishing picture of an Hungarian officer in order to see the difference between the art of Germany and other countries. One is rigid, but nearly lifeless, while the second figure seems to start from the canvas.

It is not possible to do full justice to French painting in the space that is available at Antwerp. There are, however, several works which are characteristic and remarkable. M. BONNAT'S sketch of JULES FERRY should be acquired for the use of students of art. The painter brings out his effects generally in broad masses of colour, but in his figure subjects the effects are heightened by a sort of hatching with the brush, which, it must be said, is not of much value. In the sketch at Antwerp the work is mainly done by hatching, or, in other words, by a very dry brush. We do not propose that M. BONNAT'S experiment should be imitated; but the sketch is useful, as suggesting how much can be done by a few strokes wisely directed. M. BOUGUEREAU'S *Baigneuse* is a side view of a figure with one leg resting on a rock: contrast to the flesh and the green of the background is found in a dark purple scarf. It is the sort of work which the artist turns out by the dozen; but, in spite of all the objections which are raised against his figures, no living painter can surpass M. BOUGUEREAU in beauty of line or simplicity of treatment. M. CABANEL sends three portraits, one being of the late M. ARMAND, the architect. M. JULES BRETON, who is more esteemed than ever, owing to the high prices obtained for his works in America, has three pictures, one being seven girls in white who are journeying to take part in a religious procession. It reveals the skill of the painter, who can treat subjects of this kind with a delicacy that is almost unique. M. DUPAIN, a young artist of great promise, has a study of his *Vénus Sédérale*, which is intended for the Observatoire of Paris. M. FANTIN-LATOURE sends two pictures which correspond with his lithographs of the *Damnation de Faust* and the *L'Or du Rhin*; it is difficult to say whether the paintings or the lithographs were the original expression of the artist's thoughts. The venerable M. FRANÇAIS, who is the NESTOR of landscapists, has three works, and happily they show that his love of nature and his skill in rendering the poetry of landscape are unabated. M. GÉROME once more gives a sketch of a nude girl in an eastern bath under the title of *Vapeur humide*, the figure being seen through the mist.



M. JULES LEFEBVRE this time has abandoned DIANA and her nymphs, and displays new powers in his *L'Orpheline*, a peasant girl with an old woman in a church. M. LE ROUX has a few small pictures of classic subjects, the *Vésuve* being little more than indicated on the canvas. M. ALBERT MAIGNAN's attempts to become an interpreter of English history have not found favour with his countrymen. His *Death Chamber of William the Conqueror*, which some years ago was admitted to the Salon, remains unsold, and is not likely to remain in Antwerp. The painter's genius is not sufficiently strong for epic themes. Among the works lent by the French Government is one of M. ROPS, the copper-plate printer, who is seen at his press in a garret scrutinising a proof on vellum. It is the work of M. PAUL MATHEY, and should bring many commissions to the artist.

As was to be anticipated, the Belgian artists, and especially those living in Antwerp, occupy the larger part of the walls. It is easy to mark a difference between the general style that prevails in Antwerp and Brussels, the artists in the latter city coming nearer to their brethren in Paris. There is, however, uncertainty about the class of subjects which are most pleasing to the public. When an artist like M. OOMS gains a commission from the Government to adorn the Cour d'Assises with such a noble work as his *Innocence Protected by the Law*, he can give most of his attention to historic subjects. But with other artists the case is otherwise. There is M. VAN DER HAEGHEN, for instance. He is known in England as a painter of history, but in the Antwerp Exhibition he is represented by two triptiques which are devoted to the fishing trade of Blankenberghe. They are painted with great realistic power, and will be valuable as works of art and as records of an industry which at present is picturesque, but is likely to become prosaic from the increased employment of steam trawlers.

As there are over fourteen hundred works in the Exhibition, it would be vain to give more particulars concerning them, but the English student of painting would do well to pay a visit to Antwerp just now, and he may be confident that he will have no crowds to impede his investigations.

#### BIRMINGHAM SCHOOL OF ART.

THE distribution of prizes to students of the Birmingham Municipal School of Art was made by Alderman Kenrick on Thursday evening last week.

In the course of an address to the assembled students and their friends, Mr. Kenrick observed that there was no other town in the kingdom which could boast of nine branch schools in connection with a central School of Art. Last year as many as 880 students were working in those branch schools, and he ventured to anticipate that the number would soon reach 1,000. As a matter of fact, the present autumn return showed the number to be 1,244. The awards were distributed amongst all the schools receiving aid from the Education Department, whether they were Board schools or were known as denominational schools, and in proportion to the number of the scholars. When this scheme was promulgated it was estimated that the number which would probably be added to the branch schools was over 800. At the present time, in the second year of its working, the number was 330, so that they were well on their way towards the final adoption of the scheme. The classes of children drawn into the schools were characterised by a very high standard of intelligence and industry, and if he was not much mistaken they had materially added to the successes in the year's examinations. The committee had always had in view the consideration that they would not fully accomplish their work unless they extended the operations of the central school, as a directing and inspiring influence, throughout the art teaching of the town. They felt that, with all the great advantages they had in that school, with all their talented teachers, and with their most able, zealous, and talented head-master, who had the widest experience of any head-master in a School of Art in the kingdom, with all the appliances placed at their disposal by the liberality of the burgesses, it would not satisfy the conditions of the case until they had made the influence of the central school thus felt, and the ratepayers would not reap a full reward for their generosity. At the same time, by a wise decision of the governors of King Edward's School, a connection which had existed for many years with only partial interruptions between the schools of the foundation and the School of Art had now been consolidated and settled on a lasting basis. Not only were the advanced students under that foundation sent to the central school for their art education,

but all the head-masters had the right to call in the head-master of that school to consult with them as to the methods employed in their schools, and to give them the advantage of his experience and knowledge. Seeing that this had been done, and that the School Board had placed at the disposal of the committee their classrooms for the extension of branch schools, the committee made an approach to them, and formed a scheme which, in the nature of things, would meet all the requirements of the case and would be of great advantage to all the students under the Board. All the male pupil teachers and candidate pupil teachers, instead of being taught, as they had hitherto been, without any connection with the School of Art, would be sent up to that school, and would be taught by masters on its staff. That was one important link in the chain. Besides that, however, three teachers of the school had been appointed as inspectors of all the drawing teaching in the Board schools, and their duty would be to give model lessons pointing out what experience had shown to be the best method of teaching. They would also report upon the work done, and keep the central school in touch with it. Their reports would be sent to the committee of the School of Art, and forwarded by them to the School Board. Last year he discussed the probable effect of the Technical Education Bill then before Parliament on the art instruction of the town, supposing it should pass unamended into law, and he deprecated a disturbance of the existing condition of things, under which the responsibility of the art teaching was accepted by the Town Council; and he ventured to hope that, whatever form the Bill might assume, the School of Art and the School Board would find a way of working harmoniously together. One other development there was, not only important in itself, but to be welcomed as a herald of better things in art manufacture and its connection with the School of Art. In May last the committee received a communication from the Birmingham Jewellers' and Silversmiths' Association, in which the association proposed that the School of Art should open a class or classes for the instruction of youths between twelve and twenty years of age engaged in the jewellery and silversmith's trades. One condition of the proposal was that the classes should be carried on in separate rooms by distinguished head-masters, and with a definite line of study, preparatory to the practice of artistic design suited to the trades mentioned. The fees were to be paid half by the association and half by the employers, and the association guaranteed at least forty students. The committee gladly recognised the willingness of these manufacturers to make a connection between their trades and the School of Art closer than any which had subsisted in the past. It had been one of the chief discouragements of the committee that they had hitherto failed to enlist in the way they desired to do the assistance and attention of the art industries of the town; and one of the principal justifications of the Town Council in establishing that school had always been stated as the fact that its operation on those industries would greatly add to their prosperity. He need not say, therefore, how gratified they had been to receive this proposal; and to find that the class, instead of opening with forty, had opened with ninety-five students. He hoped that the success of this scheme would be a cause of encouragement to employers in other art industries, moving them to go and do likewise. In Paris the art manufacturers made it conditional that their apprentices should study in the art schools, and they reckoned that study as a part of the regular work of the day. When they did that in Birmingham he was satisfied that it would be of the greatest advantage both to employers and employed, and so to the general prosperity of the town. The number and variety of the applications of art to Birmingham industry could hardly be exaggerated. Birmingham, more than most towns, should call in the assistance of the artist; and therefore his appeal had a peculiar importance and weight.

In summarising the results of the science and art examinations conducted in Birmingham during the past year, Mr. Kenrick said that the third-grade passes in the central and branch schools had been 417, against 367 last year, and in the branch schools alone 59, against 32. The failures had been very few. The second grade elementary prizes principally concerned those whom he was addressing, but it was impossible to compare the results of this year with those of previous years, because the Department had altered their regulation. In previous years there had been two divisions, the "excellent" and the simple "pass," and so much apiece was allowed on a number of drawings which were sent up. This year they had no longer received those drawings, and they had regulated the passes so as to include apparently some who were before excluded. At all events, they had divided the successful candidates into three groups—excellent, first-class pass, and second-class pass. The management of the school was led to believe that the "excellent" was a rather higher examination than before, and the "first-class" rather higher than the old "pass." However, he had not been prepared for the enormous increase in the number of passes which had taken place. It was, as a fact, almost double that of former years, and in the branch schools it was more than double. He could only sup-



pose that a number of drawings sent up in past years had been very near the old standard of pass, or that the work of the year had improved, or perhaps both. The total number of passes in the second grade had been 1,189, as against 655 in 1887; at the branch schools alone the number had been 754, as against 342, and there had only been 9 per cent. of failures, against 40 per cent. in the previous year, with 11 per cent. in the branch schools, as against 41 per cent. A summary of the third and second-grade examinations showed 1,606 passes, against 1,022 in 1887, and that the failures had been at the rate of 35 per cent., against 53·86 per cent.; 150 students had received third-grade prizes, as against 152 in the previous year, and 7 students in advanced class had been similarly honoured, as against the same number. That branch of the work by which the teachers of the future were prepared had sent up from the central school 152 examples, as against 101 in 1887, and all of them had been accepted as qualified to receive a certificate. From the branch schools, which were supposed to be elementary schools, 21 such works had been sent up and accepted.

He wished that his voice could reach the builders and machinists of the town, asking them why they could not use a little more freely the facilities which were given at these branch schools for teaching building and machine construction, and practical, plane, and solid geometry. He was sure it was only necessary to direct their attention to those facilities, in order to find them willing to avail themselves of those branches of technical instruction. In comparing the results of Birmingham with those of other towns he was a year behind. The third-grade passes of Birmingham last year were 334, or 54 per cent. of the whole number; of Glasgow 100, or 20 per cent.; of Leeds, 33 only; of Manchester, which had a very important school, and was a dangerous competitor, 110 only, or 18 per cent.; of Sheffield 79, or 20 per cent. The third-grade prizes of Birmingham were 115 in number, or 18 per cent. of those presented; of Glasgow 56, or 11·33 per cent.; of Leeds, 18; of Manchester 63, or 10·5 per cent.; of Sheffield 26, or 6·5 per cent. The average of passes in 209 schools and 24 branches was 8·6 per cent. of the students sent up, and of prizes 2·8 per cent.—in each case one-sixth or less of the percentage achieved in Birmingham.

The awards in the national competition were not quite so pleasant to contemplate. This year Birmingham had only received 30, against 47 in 1887 and 28 in 1886. Of these 30·19 were in the subject of design, which was an increase on the previous year, when they had 14. But Manchester had 53 such awards, South Kensington 22, West London and Glasgow 19, Lincoln 14, Nottingham 12, and Edinburgh 10. A rather remarkable and painful circumstance was that Birmingham received no award for painting or drawing from the figure. Now they had always flattered themselves, and they had been justified in doing so by the awards given in previous years, that the figure was one of the strongest subjects in their classes. Last year they received eighteen awards in that subject—two silver medals, four bronze medals, and fourteen book prizes. If they had received a similar number this year their awards would have been forty-eight. What was the reason of the falling off? Was it a loss of teaching power and skill, or of ability on the part of students? Had there been any deterioration in the quality of the work? He was a layman in these matters, but he answered those questions without hesitation with a most decisive negative. It seemed from the report that they desired to see a real background behind the figures, and they protested against "the confusion which has arisen in some places, and in particular at Birmingham, between the kind of work necessary and desirable in a study from nature and that which may be allowable when composition in the treatment is necessary." They, as students, thought they had been complying with these conditions, but it appeared that they had not fully understood them. Therefore they had taken steps to ascertain from the Department exactly what its requirements were, and it would be their study—as it was their interest—to comply with those requirements, if, by so doing, they ran into no danger of stamping out all originality from the masters and students. If it should turn out, however, that the style of painting was condemned because it was not the precise style which approved itself to the examiners, as far as he was concerned he would protest against what he would venture to call any such artistic bigotry. It would mean an attempt to conform all students to one style, which was not a national style, and would be injurious to the development of a national and spontaneous style of art. He hoped that that was not the interpretation to be put upon the opinions of the examiners. He did not attempt to disguise the feeling by which he was actuated—that the schoolmasters and the students had been harshly dealt with. He thought that they ought to have had a more direct intimation if their methods were so vicious and deserving of such severe censure. They should have been told in plainer terms what their failings were. They had gone on in the dark, knowing that they were doing their best, and thinking they were doing very well. No one who looked at the paintings and drawings from life in the school would come away, what-

ever his opinion of style, without a very sincere respect both for the teachers and for the students who produced those works. Those very students whose studies from the life had been rejected had received awards from the Department for decorative panels, in which they had used the knowledge they gained by such life-studies. In those panels they seemed to him to show a great originality and very considerable knowledge of the resources of art. Such qualities the examiners could not pass over, and he was glad the students had received rewards for them, though not in proportion to their merits.

The head-master, Mr. E. R. Taylor, referred to the Technical Education Bill, expressing regret that the clauses which provided for manual training as part of the school work of young children had not been made law by a special Bill to themselves. Later in life the only things of value to the workman which could be imparted in schools were such principles and practice of science and art as they could apply in the workshops. The great hindrance to this application of the workman's knowledge was want of opportunity caused by commercial considerations. The London Society of Arts was making efforts to stimulate workmen and employers in this direction by the offer of very valuable prizes to workmen for their work. The potter on the wheel and the glass-blower at his furnace too often had their early art instincts crushed out of them by the conditions of manufacture. It was sad to see a potter who spent fourteen of the best years of his life on the thrower's wheel to learn his trade, and developing a delicacy of eye and hand superior to that of most artists, ground down by the conditions of manufacture and the providing of daily bread, until his ambition had to be satisfied by producing 72,000 cups of exactly the same pattern in one week; or the glass-blower, with no opportunity for seizing and developing those artistic hints which the very processes of manufacture were continually presenting to him. Birmingham trades, such as those of glass-blowing, hammering of metals, jewellery, glass-painting, &c., however much they might be hampered by trade conditions, were happily not so much under the demon power of machinery as to render impossible opportunities for the artistic and technical development of the workmen, and now that the jewellery and glass trades were making such efforts for the better technical education of their apprentices they might reasonably hope that opportunities would be made available to workmen. As regards the design, that was based on a close and reverent study of nature and a knowledge of the work of the past, and the laws, rules, and motives which had been evoked out of this history; the work itself must be of the man and of the time. Three giants bound them in their doing: the material, the purpose, and the limits of our powers. These also were the limits of conventionalism; all other conventionalism being affectation, or the slave bonds of precedent. The finest work of the past and the present grew from a sense of expression, a feeling for beauty of hue, and a reverent love of colour. This was designing in the highest sense of the word, but in how much of the clever and dexterous work of to-day were these things absent? Scraps of natural forms, such as flower foliage, figures, &c., whether copied direct from nature or from books, and indiscriminately applied to objects of utility, were in no sense designs, nor were scraps of recognised ornament similarly applied. One sometimes heard it said, "We only want new shapes, for we have plenty of ornaments to stick on;" but such men forgot that ornaments were not necessarily art, and that too often they were a cloak to hide the hypocrisy of bad work.

## INSURANCE OF WORKS OF ART.

A REPORT in the form of a Blue-book is to be issued by the executive committee of the Manchester Jubilee Exhibition. With regard to the care of the fine art works, the committee state that the enormous value of the works of art entrusted to the care of the committee naturally caused them much anxiety. From the outset it was apparent that it would be impracticable for the committee to undertake to insure the whole of the pictures and drawings against damage by fire. Estimated as these roughly were at 2,000,000*l.* value, it will readily be seen how impossible it would have been to place such an amount with insurance companies, or, at least, to pay even a reasonable premium for the protection. The committee, therefore, in the first instance, gave instructions to the architects to devote special attention to the construction of the fine art galleries, so as to minimise, as far as possible, risk from fire. These were accordingly placed in a position remote from the machinery section, and were separated from the main building by a 9-inch brick wall. Internal communication was by iron doors only, standing in concrete beds. The three communications with the main buildings were also by iron doors. All these doors were specially made by Messrs. Chubb & Son, of London, and formed an exhibit in themselves. The whole of the woodwork throughout the buildings was painted with fire-proof solutions. Numerous appliances for fire extinction were



placed in the galleries and in their immediate vicinity. These are more particularly described in the report of the Fire Prevention and Appliances Committee. Notwithstanding the fact that no machinery in motion and no steam power were used in the main buildings, some of the insurance companies, on being approached, quoted similar rates to those charged at the Edinburgh and Liverpool Exhibitions, where the materials used in construction were of a much more hazardous description, and where no special care had been observed in excluding the elements of danger; 31s. 6d. per cent. was at first quoted as the rate for the fine art galleries and their contents. After a careful inspection of the buildings when they were so far advanced as to admit of a proper estimate being formed of the risk, 21s. per cent. was named. Thereupon the committee decided not to insure the buildings at all. Through the liberality of a large proportion of the contributors of works of art, the amount for which the committee were obliged to seek protection was limited to 630,000*l.* The majority of the companies firmly adhered to their quotation of 21s. per cent. for the insurance of the pictures and drawings. A few of the leading companies, however, declined to join the "ring," and accepted the committee's offer of amounts at 7s. 6d. per cent. Lloyd's underwriters also came to the committee's assistance. The committee were fortunate in securing the advice and experience of Mr. Thomas Land, surveyor in Manchester to the Phoenix Fire Office. That gentleman prepared a description of the buildings and drafted a form of policy which were ultimately adopted by all the companies placed on the risk. After protracted negotiations, the committee arrived at the conclusion that they must either accept the companies' terms and pay the premium, which was now reduced to 15s. per cent. (this rate to apply to all the insurances already effected), or adopt some other means for obtaining the necessary protection. It was, therefore, unanimously decided to form an Underwriters' Association among the members of the committee and their friends for the purpose of affording the additional security still required. A private circular was accordingly issued. This arrangement was effected entirely on a commercial basis. The terms of the underwriting deed were settled by Mr. McLachlan, counsel to Lloyd's Association, and the subscribers received the premium of 7s. 6d. per cent. in due course. The total amount subscribed for was 246,500*l.* By means of this arrangement the committee were enabled to adhere to their original resolution, and declined to pay more than 7s. 6d. per cent. for fire insurance. The committee were also obliged to effect insurance with Lloyd's to the extent of 678,670*l.* to cover works of art against all risks (except fire) while in transit to or from the Exhibition, or in the art galleries. Of this amount about 500,000*l.* was insured at 2s. 6d. per cent., the remainder being placed for the most part at 5s. per cent. The statuary was not insured. The gross amount paid in insurance premiums was 3,376*l.* 17s. 3d.

### RESTORATION OR DESTRUCTION.

THE following letter to Dr. Jessopp in reference to Cossey Church appeared in the *Times* of Monday, the writer dating from Costessey on September 7:—

"My attention has been drawn to a letter written by you to the *Times* of Monday last upon the above matter containing one or two inaccuracies, due I have no doubt to the imperfect knowledge which you say you had of the church as it existed, but which I think should be corrected in justice to myself, as one taking a principal part in the nave restoration, and to others who also took part in the work. 1. The whole of the heads of the nave windows were built up with bricks and rubbish, and the tracery destroyed, when we commenced operations, and there existed only a very small portion of the jambs and mullions, these being so bad that sufficient could not be obtained to form one window out of the six. 2. The old jambs and mullions have been as closely followed as possible, and the tracery now inserted is correct in period. The work was executed in moulded white brick made here, and for which the place is so justly celebrated all over England. This is equally as durable and more economical than stone, which is a most important matter when you consider the enormous difficulty in raising funds for the work in a parish situated as this is. 3. The old roof was absolutely rotten and was full of holes, through which birds and rain entered at will, and could not be repaired. The present one is exactly similar in construction, with the addition of a little more moulding to the principal rafters, a decided improvement I venture to think. 4. The seats in the church consisted of a few benches, the greater part of the floor being occupied by square, high box-pews, in most inconvenient and irregular positions, with a 'three-decker' pulpit and sounding-board complete, almost in the centre of the nave against the south wall; the whole church being heated (!) by a close stove, with a long iron chimney going nearly half-way across the floor. The seats have been replaced by very fine

convenient open benches throughout (a gift to the church). A very good pulpit (also a gift) has been fixed in proper position, and the whole church has been heated by hot water. With these facts before you, I venture to think that you would not wish us to be 'linked' with such a past—a past which, although not 'brutally obliterated,' has been wisely removed and a better and more beautiful present substituted. So far as the chancel is concerned, I quite agree with the remarks in your letter. I have done my utmost to prevent the wanton destruction of the roof and windows, with what result I hope soon to see.—I am, yours obediently,

"T. H. B. HESLOP."

The following are extracts from various letters on the subject:—

Mr. R. Milburn Blakiston, F.S.A. secretary, writes to show that the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels—as instanced by this case—is not unmindful of what is due in matters of restoration. An application for aid from the Society towards the restoration of Cossey, or Costessey Church, was received in March 1887, accompanied, in accordance with our requirements, by the plans and specification. In due course these were submitted to the committee of hon. consulting architects, by whom grave exception was taken to much of what was proposed. After considerable correspondence on the points objected to, the committee requested Mr. Ewan Christian to inspect the church. He did so, in company with the vicar and local architect, and advised what course should be taken. His report fully confirmed the objections already raised. Upon receiving an assurance from the local architect that he had found the roof-timbers to be rotten, the following decision was sent to the vicar on November 3, 1887:—"If the roof is so decayed as the architect states, it must necessarily be renewed; but as regards the windows it would be better to repair one at a time, preserving the old stone of the jambs, &c, still remaining, rather than to carry out the work in terra-cotta as first proposed. As regards the reseating, also, the old Norfolk arrangement of the benches should certainly be preserved." The Society voted a small grant conditionally upon the plans being carried out in accordance with these requirements. It remains to be seen whether a certificate can be given showing that this has been done.

Mr. Anderson and Mr. White, of the Royal Institute of British Architects, state that the papers of general advice, referred to by the *Times* as having been published by the Royal Institute of British Architects a quarter of a century ago, have been recently revised and enlarged. They are entitled "Conservation of Ancient Monuments and Remains" and "Hints to Workmen Engaged on the Repairs and Restoration of Ancient Buildings," and may be obtained at the office of the Institute by anyone requiring such information.

Mr. Evans, the president of the Society of Antiquaries, has read "with no little amusement, but without surprise, Lord Grimthorpe's outburst. Although I am apparently selected as the special object of his vituperation, I am 'not careful to answer him in this matter,' nor am I desirous of imitating his style of controversy. The question of what is real and judicious restoration is one on which the educated public is competent to form an opinion, and my only object in now writing is to inform your readers that copies of the memorandum of the Society of Antiquaries on the subject of church restoration can be obtained gratuitously on application to the secretary at Burlington House."

A correspondent is gratified to find that the Society of Antiquaries is now alive to the destruction which has for so many years been going on under the name of "restoration":—"It would, however, be interesting to learn why the Society has so long delayed its protest. If it had taken up the question a generation ago much of the mischief that has been done might possibly have been prevented. In respect to churches, there can be no question that the prime delinquents have been those who should have been their stoutest protectors. Dr. Jessopp may wail and lament, but I doubt if he would find many of his brother parsons in the county of Norfolk who would agree with him in the matter of Cossey Church. The truth is that what is primarily required to bring about a better state of things is some reform in the system under which faculties are obtainable. At present there is little or no control over those who desire to make alterations, however destructive such alterations may be. A notice has to be posted on the church door for a certain period to give people an opportunity of objecting, and then, if nobody objects, and all the legal formalities are observed, the faculty is granted. A clergyman once told me very frankly that he waited until the only person of importance in his parish who was likely to interest himself on the subject had gone away for his summer holiday, and then posted the notice and obtained the faculty in his absence. What seems to be wanted is some body in each county or diocese to whom all schemes for repair or alteration should be submitted, and by whom they should be approved before any faculty is granted or any work undertaken. Whatever authority may be constituted, however, one



thing is certain, and that is that the persons composing it must not be such as would be subject to the dominating influence of professional architects. They must be able to hold their own against the gentlemen under whose guidance, hitherto, so much mischief has been done. It might be invidious to mention names, but it is perfectly well known that there are plenty of well-qualified persons in the country who would form most efficient boards of control over all projects of restoration. On certain points, such as structural stability, the boards would naturally call in the aid of professional experts."

Mr. Evans replies to this:—Your correspondent inquires why the Society of Antiquaries has so long delayed its protest with regard to church restoration, and suggests that if the question had been taken up a generation ago much of the mischief that has been done might possibly have been prevented. Allow me to inform him that in May 1855, when the late Lord Stanhope was president, a memorandum on the subject was published by the Society, a copy of which I enclose. From that time until now the aid of the Society has been frequently invoked to arrest, if possible, the hand of the destroyer, and on some occasions not without success.

On Croyland Abbey Mr. John T. Markley writes from Eastbourne:—Churchmen, students of history, archaeologists, and educated people generally will regret to learn—as I have just learned from the local rector—that the famous old abbey at Croyland is in danger of speedy destruction. Situated in the great plains of South Lincolnshire, nine miles north of Peterborough, the remarkable abbey at Croyland is a conspicuous monument of old monkish times for many leagues around in the very fertile meadowy levels of Eastern England. From a considerable personal experience of the locality and the abbey records, I may inform those who only know Croyland Abbey from books and pictures that it is one of the most interesting parish churches in the land. To detail the wonderful Mediæval history and fabric features of this fine abbey would be to presume too much upon the lack of information of the travelled or the home reader. This I will not do, as the history of Croyland is the history of the hill-less Fenland for centuries past, rich in legend and the folklore of religious story. The Rev. T. H. Lebeuf, the present rector, tells me that 3,000*l.* is needed at once if the abbey is to be saved as a splendid ruin, which is also available for the only parish church on the borderland of the Fens, and where the concentrated rural population is over 2,000 people. The abbey, a survey just made shows, must be immediately dealt with or it will become a developed ruin without the facilities for Anglican worship. This practical need intensifies the poetic argument and appeal for prompt restoration, and I would, through the press, ask the public to send the rector of Croyland Abbey assistance, and so save a local church which is a national monument.

### BAPTISMAL FONTS.

AT the second meeting of the Cumberland Archaeological Society held in Carlisle on Thursday last week, a paper was read by the Rev. J. Wilson, vicar of Dalston, on "The Baptismal Fountains of the Deaneries of Carlisle," including St. Paul's, Crosby-on-Eden, Scaleby, and Bowness-on-Solway. The history of fountains in England since the Reformation, he said, was not a bright one, and if the time ever came when the survey of our territorial limits was complete, it would be found that the diocese of Carlisle furnished no exception to the general rule. There were many fountains up and down the diocese which could not lay claim to much antiquity, but still they had been used for years, some of them for centuries, and were now to be seen in rectory gardens.

As to the fountain in St. Paul's Church he had a sad story to tell. It was originally in the nave of the cathedral, but was transferred to St. Paul's, and placed on the north side of the west door when that church was completed in 1870. According to the Rev. F. Richardson, a former vicar of St. Paul's, when the new St. Mary's Church was built, the architect of the new church presented the fountain now in that church; and hearing that the late Mr. Mounsey, the then diocesan registrar, had either removed, or intended to remove, the old fountain into his garden, he (Mr. Richardson) in order to save it from the improper use to which it had apparently been intended to put it, and to preserve a relic of old St. Mary's in which he believed generations of Carlisle people had been baptized, applied to Dean Close to have it removed to St. Paul's. His request was complied with, and, with one exception, what had been sculptured on the fountain was altered into the sacred monogram. The exception was a dove with a branch in its mouth which they would still find there. Whilst undergoing the "repair" mentioned by Mr. Richardson, the form of the fountain was changed from a hexagon into an octagon, very slightly lop-sided; and until he saw stronger evidence to the contrary, he should believe that it belonged to the Late Decorated period, and was probably given to the parish church by the Corporation of

Carlisle, or by the bishop of the diocese about the year 1360.

The fountain in the church at Bowness-on-Solway was a rich specimen of Early Norman work, standing near the principal entrance in the centre of a square Georgian pew. The bowl, the only original part, was, like Crosby-on-Eden, square, with corners chamfered to meet the stem. The raised ornamentation, with which the whole bowl was covered, was rude, well defined, and might have symbolic meaning. On the west side it was quite plain that they had the vine, a figure of the Church, springing from three interlaced circles, the sacred symbol of the Holy Trinity, and the whole signifying very appropriately the nature and effects of the Holy Sacrament of the font. Interlaced bands run diagonally on the north side, the intersections forming a lozenge panel filled alternately with nail-head and round pellets. On the remaining sides and corners there was an irregular and floriated ornamentation. The moulding round the lip, very much broken, was now patched with pieces of red sandstone. It had, of course, the characteristic lead lining and the drain. It was not a little curious that Bishop Nicholson omitted to mention the fountain when he visited Bowness on July 2, 1703. For that matter, small use the parishioners could make of it had it been above ground. "The rector (Mr. Gerard Lowther) has removed all his goods to Colbyleathes, near Appleby, designing to fix his family there; and his curate is also retired into Lancashire: so that on Sunday last they had no service: nor do they know when they shall." The Rev. S. Medlicott informed him that, according to local tradition, the bowl of the fountain was dug up by one John Wallace, the then sexton of Bowness, when making a grave in the beginning of this century. This seemed probable enough, as it was seen by the Messrs. Lysons in 1808 "lying in a garden near the church." It was soon taken (said Mr. Medlicott) from the churchyard into Mr. Hodgson's garden, where it was well remembered as standing for many years in use as a flower-pot until presented to and put by him into the church. There could be no doubt that it had been buried by some pious person to save it from desecration or more probably destruction in times when every sacred relic of the Church Catholic had been set at naught. In 1848 the Norman bowl was placed by Mr. Hodgson on the octagonal stem with a square base.

The fountain at Crosby-on-Eden was Norman with a square bowl, with the lower part of the corners chamfered to meet a cylindrical stem. The whole rested on a square plinth, was of good red sandstone, and had a drain. The bowl bore evident marks of ill usage, but one wondered that it was in such good preservation when one remembered that Crosby Church was north of the Eden, and exposed to hazards during the Border feuds. When Bishop Nicholson visited in October 1703, he found the fountain "pretty well." It must have fared worse since, probably in 1745, when, according to local tradition, the rebels stabled their horses in this as well as Stanwix Church. At all events the bowl was scored with deep lines, and one side had been manifestly used as the parish whetstone. The fountain at Scaleby was supplied in 1707, and consisted of an octagonal bowl and base with a circular stem. The bowl was shallow without a drain, and the whole fountain was of a filthy yellowish colour. On one side there was a wedge of iron leaded into the bowl which served probably as a book rest.

### TESSERÆ.

#### Architectural Drawing.

G. E. STREET.

THE art of drawing, as practised by an architect, ought to be subservient entirely to the object in view. The object is the representation on paper of what he wishes to build, with such exactness and clearness that no workman shall have the slightest difficulty in carrying out precisely his intentions. There is, in the first place, therefore, nothing so much required as painstaking accuracy in your work. It is a habit which, once acquired, is never entirely lost, and without which the drawing properly of intricate works, as, for instance, designs for details of all elaborate stone or metalwork, is hardly possible. I know no means so good of attaining this power as the sketching and measuring of existing buildings, or portions of buildings, and then drawing them out to scale and in ink, with every joint of the stonework, every feature of the detail, carefully and accurately shown, and without any tint or colour upon the drawing, or any etching on its face of lines, which may look picturesque, but which do not exist in the original. I desire especially to warn you against wasting much time in trying to learn to put the conventional architectural tints in monochrome on your drawings, which would be of no possible assistance to any scientific person in aiding him to form a judgment of a design, and which seem not unfrequently to favour the careless delineation of details in the first place, because it is obvious that, if the drawing is to be covered



everywhere with tint, the pure and true drawing of detail will all be obscured and destroyed. I believe most emphatically that this mode of "getting up" drawings, as it is called, is more thoroughly detrimental to the cause of real art among the students than anything else I can name. It leads them to substitute shadow for substance, and to waste precious time in producing effects which, at the best, are not beautiful, and in no case are useful. It encourages them in the too popular delusion that an architect's business is to make drawings, and not to erect buildings. And it seems always to involve an attempt to impose upon the unlearned by tricking up drawings of buildings to look pretty, instead of attracting the learned by showing that the beauty of detail and accuracy of proportions and details of construction have really been studied and cared for. For the same reason the art of drawing shadows is one which you may just as well leave to people whose business it is. The architect's business is to cast shadows and create them, not to draw them. His eye ought to be trained to calculate perfectly, when he draws a hollow in the midst of a succession of mouldings, what its relative force will be, but scientific shadow drawing will not help him in this. He may reckon also very properly upon the production of masses of light and shade where his design most wants relief, but this he can do in his mind and by a glance of his eye quite as accurately and usefully as if he developed the lines of his shadows painfully athwart the elevations of his building, without the slightest reference to the somewhat important question whether the aspect of the building will ever allow the sun to shine upon it. But whilst I entirely counsel you not to trouble yourselves about making tinted elevations, I wish in no degree whatever to deprecate the most artistic sketching or drawing, or use of your pen or pencil. I strongly advise all students to spend a certain large proportion of every year in drawing from buildings themselves details of every portion. There is no other mode in which hand and eye and mind become so rapidly and so truly educated.

#### Arabesque Decoration.

A. POYNTER.

It is remarkable that the only mention Vitruvius makes of this style of decoration is in reprobation of it; but he describes it so accurately that the passage is worth repeating, if for no other reason. After pointing out and classifying what he considers legitimate objects for painting walls, such as architectural compositions, landscapes, gardens, and sea-pieces, the figures of the gods, and subjects drawn from mythology and the poems of Homer, he proceeds thus:—"I know not by what caprice it is that the rules of the ancients (observe that Vitruvius looks up to the ancients in his day—that is to say, to the Greeks), who took truth for the model of their paintings, are no longer followed. Nothing is now painted upon walls but monsters, instead of true and natural objects. Instead of columns we have slender reeds, which support a complication of flimsy stems and leaves twisted into volutes. Temples are supported on candelabra, whence rises, as from a root, foliage on which figures are seated. In another place we have demi-figures issuing from flowers, some with human faces, others with the heads of beasts—all things which are not, never have been, nor ever can be. Such is the influence of fashion that, either through indolence or caprice, it renders the world blind to the true principles of art. How can it ever be supposed that reeds can uphold a roof, or candelabra a whole building, that slender plants can support a figure, or their stems, roots, or flowers put forth living beings. Yet no one condemns these extravagances; on the contrary, they are so much admired that no one cares whether they be possible or not, so much do mankind render themselves incapable of judging what is really deserving of approbation. For my own part, I hold that painting is to be esteemed only so far as it represents the truth. It is not sufficient that objects be well painted; it is also necessary that the design be consonant to reason, and in no respect offensive to good sense." Pliny also laments that in his time gaudy colouring and quaint forms were held in greater estimation than the real beauties of art. But with all deference be it spoken, there is another side to the question, which these great authorities seem to have overlooked. Conventional decorations of this kind were within the reach of thousands to whom paintings in the higher branches of art were inaccessible, and a more general diffusion of taste must have been at once the cause and effect of their universal adoption—how universal the remains of Pompeii reveal to us. If we examine the ancient arabesques independently of these prejudices, we shall find endless beauty, variety, and originality; graceful details, combined in consistent and ingenious motives and analogies, and great skill and freedom in the mode of execution. We shall also find reason to doubt whether the introduction of the arabesque style really had the effect of discouraging painting of a higher class, since even at Pompeii poetical compositions of great merit are frequently combined with the lighter groundwork of the general decoration. However fanciful and capricious the arabesque

style may at first sight appear to be, there can be no doubt that it may be treated according to the general fixed principles of art, and that the artist will be more or less successful as he keeps these principles in view. A due balance of the composition is essential, so that the heavier parts may sustain the lighter through every gradation, and there must be such a disposition as not to cover too much or too little of the ground. Unity of design is to be studied in a connection of the parts with each other, and in the harmony of the details and accessories, which ought as much as possible to tend to some general aim. It adds very greatly to the value of this species of decoration, when it can be made by these means significant as well as ornamental. It would lead us much too far to enter upon the subject of colour; but it may just be observed that in the ancient decorative painting the balance of colour is strictly attended to. Their walls usually exhibit a gradation of dark panels in the lower part, a breadth of the most brilliant colours in the middle and principal division, and a light ground thinly spread with decoration in the upper part and in the ceiling, an arrangement dictated by the natural effects of light and shade and reflection. As lightness and grace are the peculiar attributes of arabesque, the foliage which forms its most fertile resource should never be overloaded, its details and modes of ramification ought to be drawn from Nature.

#### Sculpture in the Chapel of Henry VII.

R. WESTMACOTT.

A very remarkable series of statues will be found in the chapel of Henry VII.—works that, in certain qualities, may challenge comparison with the production of any school. They are of unequal merit, but the best of them are fine examples of the success of the Mediæval artists in treating drapery, and in the impressive simplicity of *pose*, in single figures. At the same time they preserve all the distinctive characteristics of the Gothic school, so carefully and so curiously maintained during the whole period of its existence. The works referred to constitute a portion of the decoration of this exquisite architectural triumph of the sixteenth century. The nave of the chapel is divided from the aisles by four arches on each side, and similar arches divide it from five small chapels at the east end. Immediately under the arches, and extending entirely round the chapel is a range of demi-angels, crowned in high relief. They are rather grotesquely treated; some are draped, some are represented with their bodies feathered, and, generally, they have rich, curly hair. Their function is to support, on shields, the royal devices of Henry VII.—the rose, portcullis, fleur-de-lis, &c. Over these angels are octangular pedestals and niches, enriched with tracery and foliage, containing statues about 3 feet high of saints, martyrs, and other venerable persons. There is here great variety of action, and a fine feeling for art. The draperies especially are largely and grandly arranged. In the heads, also, there will be observed a remarkable attention to the proper expression, as well as to character and form. The action of the hands is, generally, well studied. When the naked form is introduced, as in the St. Sebastian, it is conventional, and, as usual, shows no intimate acquaintance with the study of nature, but in all other respects these works possess merits of a very high class, and have justly been noticed by all the best judges of sculpture as examples, of their kind, thoroughly deserving careful study and imitation. It may be noticed that though the statues in the nave average about 3 feet in height, those in the chapels are nearly life-size. They are arranged in threes, over five demi-angels. It is to be lamented that some of these interesting works have been injured, while some have been removed, and the niches and panelling destroyed to make way for monuments, as, for instance, those of two ducal houses of Buckingham, of the respective families of Villiers and Sheffield. The statues, of all sizes, employed in the enrichment of the chapel of Henry VII. are said to have amounted, originally, to nearly three thousand. Many of the smaller ones, especially those in gilt metal, have, no doubt, been stolen.

#### Arrangement of Foliage in Decoration.

J. R. COLLING.

In applying natural foliage to decorative purposes, the first thing to be laid down is the general lines, that is, the direction and disposition of the stems which are to be afterwards clothed with foliage. Great care should be taken that these are judiciously chosen; they must not too closely follow Nature; there must be no broken or rustic foliage, such as we see so often in silversmiths' work; there must be a harmony and an agreeable contrast with the bounding or surrounding lines. In architecture nearly all ornament is obliged to be arranged geometrically, for without it is so, to some degree, it will seldom harmonise happily with the architecture which it is intended to enrich. It may sometimes be departed from to a small extent to give variety, and to gain picturesque effect; but there must be a certain harmony kept up, and the lines of the



foliage must not jar or clash with the mouldings or other architectural lines which surround it. For instance, if we take a spandrel, which is merely a triangular space left by the architectural lines in canopies and other places, the most simple of all lines to arrange the foliage upon will be three lines issuing from the centre and running to the points of the triangle. These lines are in harmony, because they do not approach too near or in any way jar or interfere with the bounding lines, and they are simply a geometrical division of the triangle into three other triangles. In the same manner, if we require the most simple lines for foliage in a square, we have them immediately in lines proceeding from the centre to each of the angles, which give the ordinary diagonal lines. Next, in the triangle, we have a triangle introduced in the centre. In the square we may introduce a diagonal square touching the centres of the sides of the larger square. This may be varied by introducing circles in place of the triangle or square; from this we arrive at the scroll in place of the complete circle. Commencing again with the first three lines, we can produce variety by uniting them by curves; further by branching, as in parsley; by leaflets in pairs, as in ash and fern; branching alternately, as in oak; and further, if required, it can be carried to any extent of elaboration and richness by following the manner of subdivision of any of the more compound leaves, as in some of the most beautiful and delicately divided ferns. Although this subdivision may probably be too elaborate to carry out in stone or wood, yet I can conceive of its opening a beautiful field for decoration in other materials—such, for instance, as diaper for linen fabrics, carpets, gold and silversmiths' work, painted decoration, papers for walls, and many other works. To return to our general lines, it is evident that variety can be gained by introducing scrolls, yet still keeping up all the original arrangement, until at last we arrive at a combination perhaps equal to the beautiful scroll spandrel from Stone Church, Kent, which perhaps, for the very charming manner in which it is arranged, is as successful as anything which can be met with. Another simple mode of arranging the lines is that of simply radiating from the centre as in flowers; the most simple, being three radiations or two threes, is in the lily, as I have already mentioned. Four, two fours, and so on, as in flowers. Another mode is that of fan radiation, as in the lupin and horse-chestnut. Of this character are many of the Greek honey-suckle ornaments. If the surface is large which is to be covered with foliage, it will be found to be highly advantageous to divide the surface into some pleasing combination of geometrical forms, afterwards filling in the spaces left with foliage. In this manner are some of the most exquisite wall-diapers of the Alhambra. Geometrical combinations have this great advantage—they are all founded on forms in Nature; there is no limit to the variety which can be produced, and they do not tire the eye like any confused or irregular arrangement. There is always a certain order and symmetry which is pleasing to the eye.

#### The Pavement of the Parthenon.

F. C. PENROSE.

The pavement of the Parthenon is bounded by four curved lines, viz., the edges of the upper step on the four sides of the building. The four angles of this curved surface are not precisely level; the south-west angle is about  $\cdot 16$  above the north-east and south-east angles. I think that this is simply owing to the lines of the earlier temple, which were also curved, being made use of as far as they would go, and by being produced in one direction only, and remaining fixed at the south-west angle. The line so produced would naturally fall below the fixed point. This is the case on the west front, south and north sides. The extreme points of the upper step of the east front are exceedingly near level. The result of a number of observations gives only a difference of  $\cdot 002$ , or  $\frac{1}{500}$  feet, a quantity which we need not stop to discuss. If these two points be joined by a straight line, the curve which forms the edge of the step will be found under the middle columns to rise to a height of  $\cdot 214$  above it. If the uniform curve had been preserved it would have been  $\cdot 218$  in the middle, which is about  $\frac{1}{45}$  breadth of front; and the curvature is so regular on the northern half of this front, where the steps rise immediately from the solid unbroken rock, and consequently no settlement can have taken place, that of four points measured at the centres of each column, three agree exactly with a circular arc: the fourth differs only by  $\cdot 003$ . The curvature is so very slight that it might be any regular continuous curve; for instance, in so small an arc no appreciable difference could be shown between the arc of a circle or that of an ellipse or parabola, and I think that the work was set out by means of the latter figure, which might be done very easily; whereas I need scarcely point out the difficulty, or rather impossibility, of using the circle, which would require a diameter of about  $2\frac{1}{2}$  miles. Let it be required to construct a circular or other arc of uniform curvature, whose length is 100 feet, and the rise at the centre is to be  $\cdot 25$ , or any other small measure which must not much exceed 1 foot. Construct with any axis a parabola, and set off from the vertex

A B = the proposed rise, and draw L M at right angles with A B. Now L M will represent the 100 feet horizontally, and ordinates drawn to the curve perpendicular to L M will determine the exact rise as many points as may be required, full size. The curve on the upper step north side of the Parthenon also approximates to a regular curve very closely. Its entire rise in the centre above the line joining its extreme parts is  $\cdot 356$ , which is very nearly in the proportion of  $\frac{3}{8}$  of the rise in the east front; it is exactly  $\frac{1}{250}$  length of the building. The curve on the south side seems to have been identical with the north side, but it has suffered more from the concussions which the building has undergone, especially as there is a great depth required on this side of artificial foundation. On the north side the steps are almost immediately from the solid rock. The curve on the west front is not quite so symmetrical as on the other sides. It has, I believe, been affected by the lines of the old building. The rise is exactly the same as the east end. The upper members on all four sides follow the steps, and are nearly parallel, but there is a little more curvature given to the steps; the entire rise of architrave is  $\cdot 173$  on east front,  $\cdot 175$  on west. The levels of those portions of the entablatures which remain on the north and south sides point out the directions which those lines had originally, and they were as nearly as possible parallel to the line of the step, excepting that just at the angle columns the step has a little the more declension. The frieze and cornice are exactly parallel with the architrave. In the temple of Theseus, also, these curves prevail; on the fronts the rise is  $\frac{1}{250}$  part of its length, on the flank  $\frac{1}{250}$ . The lines in the architrave are exactly parallel to the step.

#### The Parthenon Columns.

W. L. GRANVILLE.

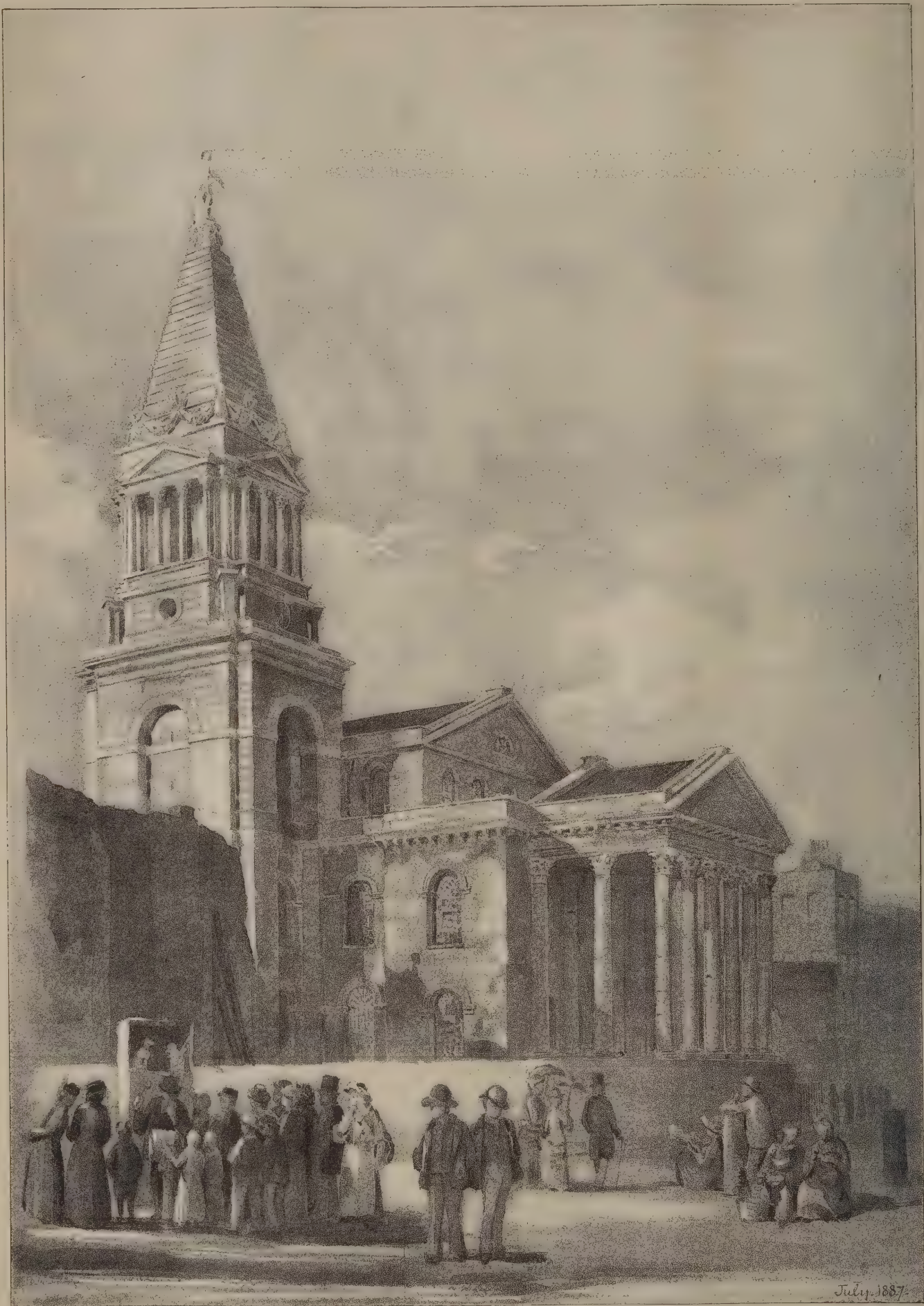
With respect to the columns, each course of which the entire shaft was composed, being brought to the building, had then to be worked at the top and bottom in the following most elaborate manner. After the two surfaces had been smoothed to a most exquisitely true plane, radiating lines marking out the division of the flutes were next indented by means of some sharp tool. Such lines may be especially noticed on the Propylæa columns. Next three concentric circles were drawn out, also with some sharp instrument, the common centre of them being the axis of the column. Every one of the eleven courses which compose the shafts of the fifty-eight exterior columns that belonged to the Parthenon had the top and bottom surfaces worked with the same care and attention, which are so remarkable throughout the whole structure, whether the parts were to be covered or to remain visible. Each course had to be lifted into its destined place, an operation which was accomplished, it is supposed, by means of a machine called the trochlea—an assemblage of pulleys, fastened to a pair of shears or other scaffolding, and which, according to the number of such pulleys, was denominated *τρίσπαστος*, *πεντῶσπαστος*, *πολύσπαστος*, &c. At the end of the rope which passed through the pulleys were fastened the *ψαλίδες*, or *Forcipes ferreae*, described by Vitruvius (Lib. X.), an instrument somewhat like a pair of large scissors, in use even at the present day. These forcipes (for I believe there were more than one pair employed if the stone was very large) were made to lay hold of the two or four rough masses projecting from the block and left for the express purpose of raising the stone. When the circular stone or first course was lifted it was set into that place which had been marked out for it, by a circle nearly the size of the column itself, on the stylobate. It was then, according to the evidence which innumerable concentric circles display on the stylobate of the Temple of Hercules at Agrigentum, turned round and round (on a pivot of wood as some suppose) and ground down to a fine surface. I must doubt, however, if this operation of grinding was performed with each successive course, as I could find no other traces whatever of it in the same temple. The material of which the Temple of Hercules is built, is of an exceeding coarse, porous nature, and would leave, perhaps, but a few marks, which the weather might have obliterated. On the other hand, the Parthenon columns, respecting which I saw no traces of the grinding, are composed of a material supposed to be too fine to leave any such marks. Certainly none remain. With regard to the flutes, they were, as at the present day, considered with the finishing of the building, and worked up wholly after it was erected, with the exception in some cases where they are began at top and bottom as a guide. The method employed was this. After the vertical lines were drawn down from the points given by the radiating lines marked on the bed of each course, as previously described, the first stage was to work the column from top to bottom into a polygon, leaving a broad band where each arris of the flute is to come. The flutes themselves were next worked out to a curve, not their final ones, but very nearly to the required depth, still preserving untouched the band where arris is to come. The final stage was to work away the band to a sharp arris, and bring the flutes to the desired depth and curve.







The Architect, Sept. 21<sup>st</sup> 1888.



"INK PHOTO" SPRAGUE & CO. 22, MARTIN LANE, CANNON ST., LONDON, E.C.

ST. GEORGE'S CHURCH, BLOOMSBURY.  
from a Drawing by J. A. SLATER.



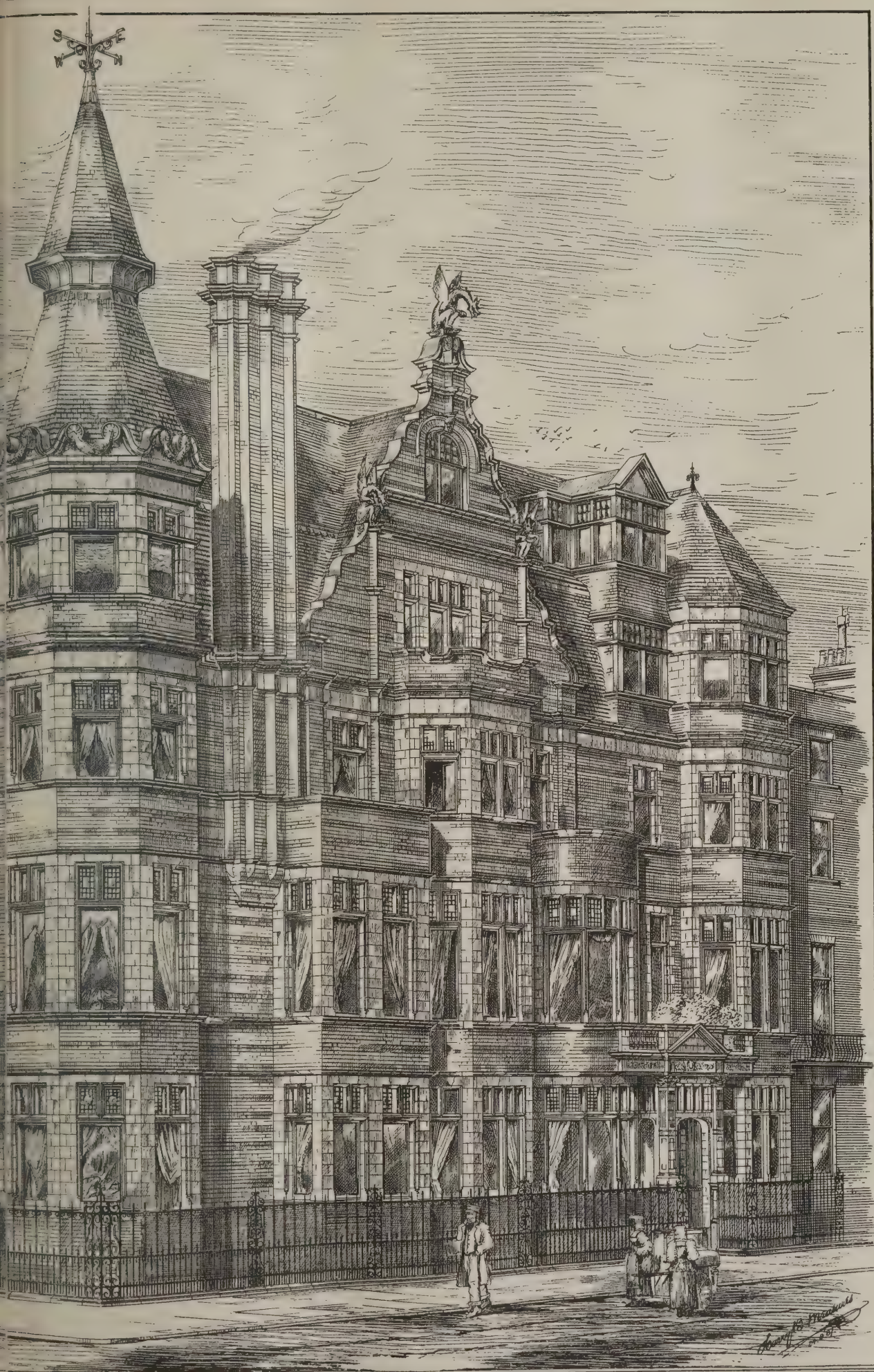






- - Mansions in course of erection at Pont St. X





Chelsea - St. - HARRY B. MEASURES. ARCHT. - -





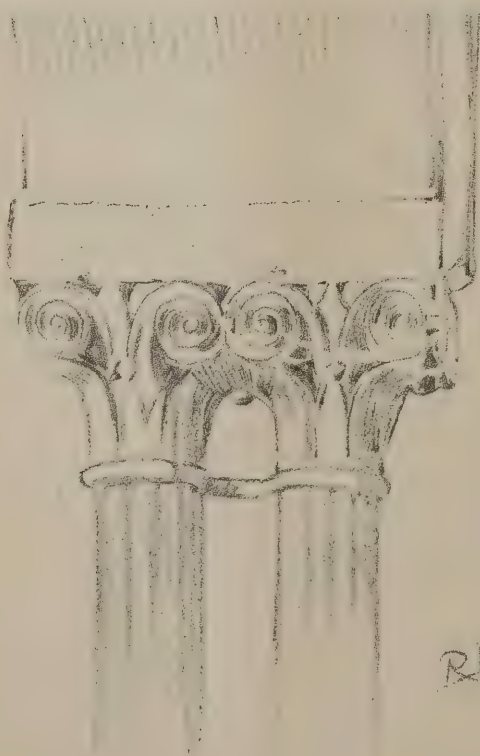






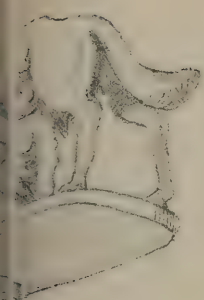


Palazzo Vecchio,  
Florence.



Cloisters,  
Genoa.

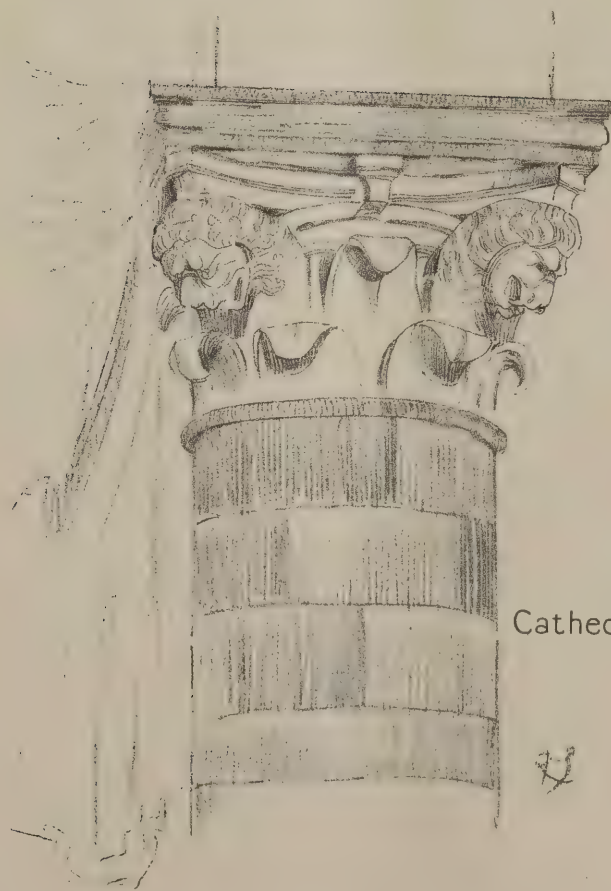




Bargello,  
Florence.

R<sup>3</sup>

Siena.



Cathedral,  
Prato.

R<sup>2</sup>

*Reynolds Barratt*









DOORWAY, CATHEDRAL ASSISI.

From a Drawing by J A SLATER







## ILLUSTRATIONS.

MANSIONS, PONT STREET.

THE five residences illustrated are in course of erection on the north side of Pont Street at its junction with Sloane Street. Generally the accommodation is as follows:—On the ground floor the library and business-room is placed right and left of the entrance, the dining-room being at the rear of the library, overlooking an ornamental garden. A large inner hall, communicating with the main and servants' staircases, is placed at the rear of the business-room. The first floor consists of a drawing-room, which extends the whole width of frontage, and a boudoir at the rear overlooking the garden. The second, third, and top floors contain nine bedrooms, with dressing-rooms, bath-rooms, &c. The basement is well lighted and ventilated throughout, the walls of passages, kitchen, scullery, larder, &c., being lined with white glazed tiling. A servants' staircase and lift is provided from the basement to the top floor. In addition to the usual gasfittings, arrangements have been made for fitting up the buildings throughout with wires for electric lighting. The buildings are being erected by Mr. WM. WILLETT, builder, of Chelsea, with elevations executed in two tints of terra-cotta bricks and terra-cotta dressings of a special tint, supplied by Mr. J. C. EDWARDS, of Ruabon. The architect is Mr. HARRY B. MEASURES, of 2 Sloane Gardens, Chelsea.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 21.—CAPITALS. [REGINALD BARRATT.]

NO. 22.—ST. GEORGE'S CHURCH, BLOOMSBURY. [J. A. SLATER.]

NO. 23.—DOORWAY, CATHEDRAL ASSISI. [J. A. SLATER.]

## DECORATION OF A DOME.

THE following account is given by Mr. Ford Madox Brown of the decoration of the dome of the Manchester Jubilee Exhibition in an article in the *Universal Review* on "Historic Art":—

"About the middle of November 1886, Mr. G. F. Armitage, of Altrincham, called on me to inquire if I would undertake the decoration of the dome of the Jubilee Exhibition then in course of construction at Old Trafford, Manchester. Mr. Armitage belongs to that class of whom Mr. William Morris spoke once, in Manchester, as "we æsthetic upholsterers," a kind of business that seems to thrive best in the hands of educated gentlemen. He had been entrusted with the entire decoration of the buildings and gardens outside them, under a committee whose chairman was a gentleman named Neville Clegg. I was informed that there were eight large spandrels of the four huge arches 72 feet wide supporting the dome, for which I was required to furnish figures, the decorative portion to remain with the committee (Mr. Armitage). These spandrels, of which the shapes were not quite fixed, were each of them 36 feet long by 18 feet deep. They would have liked the immense spaces filled in with compositions or groups. As there was little over five months to do all the work in, I perceived that this would be impossible, offering, as the utmost that the time would allow of, to execute eight colossal figures in "sanguine" or red chalk, to be fastened up on gold backgrounds. It was agreed that this should be done, or what more I could achieve in the five months up till the opening day.

At this date I had a rather sharp attack of gout—the first outline sketch of the whole (now in the possession of Mr. Bodington, of Wilmslow) was made one day in bed—and it really struck me as a remarkable instance of faith, in modern times, that the Chairman and Mr. Armitage should entrust these gigantic works to a man whom they saw with pain crawling from chair to chair. We had decided that the eight spaces should be representative of Wool, Corn, Shipping, Commerce, Coal, Iron, Weaving, and Spinning. As soon as I began to study these spaces, charcoal in hand, I found that their eccentric shapes, with one acute angle far extended like the orbit of a comet, would in any case require more than the one emblematic figure to fill each of them. So I decided that each distant angle should be filled with a winged but legless second figure—a spirit of Lancashire Energy. The long wings would fill the acute angle of the spandrel. Each spirit should bear a trumpet, each trumpet should have a banner, each banner should be inscribed "Vis." These spirits of Energy were to be all alike, each blowing up the courage of the Lancashire workers, all growing legless out from the scroll patterns which

filled the golden grounds, but four of them were to be reversed. I reckoned on only having to execute one of them myself, the seven others to be repeated by assistants. The backgrounds were to be gold; the scrolls of foliage blue, with red berries, and one red-haired angel or spirit growing from them—the more incongruous the better for decorative art. The Greeks equally with the Japanese understood this.

But when all this of the design was settled, and some of the figures studied from nature, to our joint horror we found that there was no prepared canvas, in London, or in Paris, or anywhere else that we could think of, to be had under three months' delay. Expedient after expedient was thought of and fell through. At length it turned out that a certain manufacturer of floorcloth in Dundee would supply us with as many hundred feet as we cared for of a kind of very rough and open sailcloth, 12 feet wide. This a coach painter and decorator of Altrincham undertook to prime and prepare for us. It was rough and heavy at best, but there was no time for rubbing it down or giving it a surface; the heavy rolls were only half dry when they reached my house. Meanwhile the idea of sanguine or red chalk had been abandoned, and I had offered Mr. Armitage to paint all the panels in matted oil, and undertook that the decorative parts should also be done in my studio, provided that the committee would supply me the assistants. This was, under the pressure of circumstances, joyfully accepted. The walls of my studio in Victoria Park were covered with 12 feet wide canvas, fixed on rollers, for the room was insufficient in height. A spare bedroom was cleared out and used in the same way, and latterly a large stable and carriage-house at the end of the garden was converted into a studio, and devoted entirely to angels and their 12 feet long wings. The vehicle employed was a mixture of Robertson's and Paris's medium in equal parts, but I think I should recommend in another such case Paris's medium and copal varnish in similar equal parts. When the texture of the floorcloth was too hilly or rocky, we sometimes cut out a pea-sized knot with our knives. Altogether for heads 18 inches high and figures 12 feet long, the practice was not without its advantages.

I first made studies from nature of each of the nine figures, scale of 2 inches to the foot. Then I painted one of the angelic figures of *Vs*, entirely as a pattern for the other seven. Mr. Bruce Wallace, of the Manchester Academy of Arts, undertook to repeat these for me in the garden studio. These, with the exception of a few wings and a banner or two, he set to work at with so much courage and "energy," working from six and seven in the morning, that by the day required they were all completed, and, when hoisted up, looked so like the single original, that had I not known where it was placed I could not have told it from the others. My other male assistant was an old pupil and assistant of Rossetti, named Knewstubb. He was of use in all sorts of ways, particularly as a colourist, for whenever a bit of colour went wrong he used to be sent for to daub it over, till it looked "beautiful for ever." There was, besides, one young decorator, very useful, the son of a remarkable Altrincham decorator named Thomas. And I had the assistance of four young ladies, extremely vigorous figure-painters. Partly of the Manchester Academy, these ladies had also studied in Paris. Curiously enough, in Manchester, the men are more given to landscape; the ladies are figure or historic painters, perhaps because wandering about the fields and wild places in search of studies is less safe and appropriate to female strength and habits than to the masculine mood. The young ladies—and they were emphatically such—worked with a skill and energy that nothing could baffle or impair from the top of a ladder to sitting on the floor. Two of them even offered, at last, to take my place when they heard I should have to be hoisted up 50 feet in the air to retouch some parts of the paintings that when up on high looked weak and defective—while we were at work on them the dome was simply that of heaven itself. This substitution, of course, I could not listen to, but certainly they would have gone up had I permitted it. They also, when workmen and needlewomen failed to make a good job of stitching the heavy canvases together, started off with their thimbles to the Exhibition, and with their delicate fingers sewed for two days at the canvases massive as the sails of a man-of-war, the building the while crowded with starers, for all Manchester seemed to have contrived to get in on those last privileged days. Mr. Wallace, the iron muscles of whose throat and arms I made free with for my figure of *Iron*, would, as those who know him can imagine, have climbed and painted at the top of the highest flagstaff of the building had it been required by me, but this also I had to decline. Thus with the united goodwill and good temper of seven assistants and master, and a zealous committee, the anxious work got done, and I had the satisfaction of seeing, ten days before the opening, the twenty-four rolls of canvas placed on the lorry and depart, and gradually get strained more and more in their places aloft by the heroic workmen up in their perilous perches and floating galleries. I no longer had to wake at four in the morning and remain sleepless in the horrid dread of the thing never getting done for the ever-nearing 1st of May. It is



thing of the past now, as this article soon will be. If those works (the outcome of "Lancashire Energy" not yet ended in Manchester) should in the slightest degree tend to promote in Britain that love of style that once prevailed in Greece and Italy, the writer's and painter's object will have been fulfilled.

### THE OLD METAL-WORKERS OF GLASGOW.

THE following communication has been addressed to the *Glasgow Herald* by Mr. Alexander J. S. Brook, F.S.A. Scot., of Edinburgh:—

Many years ago, through the medium of your columns, much information was elicited about the history of old Glasgow and its worthies. Incidental references were made to many of the Glasgow craftsmen, but no connected account of the old Glasgow silversmiths and their marks has yet been compiled. A good deal of plate of early Glasgow manufacture has been collected, and is now to be seen at the Bishop's Castle in the Exhibition. A memorial volume of that collection is in course of publication, and it would help me in the notes I am preparing on the plate if I could obtain some further information regarding these craftsmen of bygone times. It would aid in determining the precise age, and in clearing up much which has hitherto been shrouded in mystery.

I have collected many notes regarding the old silversmiths of Glasgow, as well as of those of the other burghs of Scotland, and I briefly give the substance of them here in the hope that it may awaken an interest in the subject, and result in the gathering together of information which a few years hence it will be impossible to do.

The goldsmiths of Glasgow were incorporated with the hammermen, whose seal of cause was granted in 1536. In this respect they resembled nearly all the other burghs in Scotland, with the exception of Edinburgh, where the goldsmiths formed an incorporation of their own. Unfortunately the records of the Hammermen's Society are lost, with the exception of one volume, 1616-1717, which is now in the possession of the secretary of the society. This might furnish some valuable information if any antiquary could be found to go carefully through it.

The first reference to a goldsmith occurs in 1616. Glasgow at that time was a small burgh and university town, containing about 5,000 inhabitants, some of them merchants, others craftsmen—not such individuals as would be found now carrying on trade or the useful arts in a burgh of the same size, but men accustomed to the use of arms, and retaining a strong tinge of the feudal system.

No very early plate of Glasgow manufacture is known to exist. This is not to be wondered at, for the following extract from the burgh records—date 1639—explains it:—"The said day it is ordanit that publication be made throw the town, be sound of drum, that the inhabitantis of this burgh bring their hail silver plait, to be bestowit in defence of the good common cause in hand, conforme to the ordinance of the committee at Edr."

About the end of the seventeenth century we glean a comparative view of the numerical strength of the trade from a jotting on the back of the draft of a proclamation preserved in the Edinburgh records. From this it appears that, besides the goldsmiths in Edinburgh, who were about 25, in Glasgow there were 5, Aberdeen 3, Perth 1, Inverness 1, Ayr 1, Banff 1, and Montrose 1. In all these places plate was manufactured and hall-marked with the distinctive mark of the burgh.

The social status of the goldsmiths of Glasgow differed much from that of those of Edinburgh. In the capital they were the bankers, money-lenders, and speculators of their day; while in Glasgow it was the merchants, and specially the "tobacco lords," who were the trade aristocrats. This may account for the fact that it was no uncommon thing for some goldsmiths to be partners in many strange concerns, altogether alien to their ordinary business. Thus we find that the most famous family of Glasgow goldsmiths—the Lukes of Claythorn, much of whose plate is to be seen in the Exhibition—were partners in a soapery, an ironwork, and in many adventures with ships—notably in one in which cherry sache was first imported into Glasgow. On the other hand, monopoly was the rule of the trade in Edinburgh; and, as is abundantly proved by the records, if any goldsmith ventured beyond the strict limits of his trade, he was speedily expelled from the incorporation, and his name deleted from the roll.

It is questionable if up to 1730 any goldsmith had a shop in Glasgow. In 1753 Robert Luke, who was at one time treasurer for the city, was succeeded by Bailie James Glen, and it is noted that at that time he was almost the only one in the trade in the West of Scotland. Again, in 1790, we find that there were only two goldsmiths' shops of any note in the city—one kept by Adam Graham, in King Street, and the other by Robert Gray, in the Trongate; and, strange to say, the latter silversmith could, in addition to his more valuable wares, always furnish a customer with a cane or umbrella, the umbrella,

at that time a modern luxury, being usually made of yellow or green glazed linen.

The burgh mark, impressed on all Glasgow plate, is the city arms, which commemorate the well-known miracle of St. Kentigern, the patron saint of the city, with reference to the recovery in the fish's mouth of the lost ring of the frail Queen of Caidyow. The early punches are unusually large in size, but vary little in detail.

In some early specimens of Glasgow plate there appears what seems to be a variable date letter. Specimens of two alphabets have been found between 1696 and 1708. From 1720, or possibly a little earlier, the letter S, enclosed in differently shaped shields, seems to have taken its place, and was impressed on all plate down to the establishment of the new assay office in Glasgow in 1819, after which date the date letter was again introduced, and is still continued. Can any one trace the origin of this S, or tell by whom it was stamped, and what it meant?

From many sources the following list has been compiled. Some are represented by initials, for their names are unknown to me. They are arranged as near as possible chronologically, but in many cases the date is only conjecture:—

1616. John Kirkwood.	1753. D. W.
1660. W. Cockburn (fr. Edin.).	1765. B. & N.
1665. Thomas Moncur.	1765. I. F.
1665. John Louk or Luke.	1765. Samuel Telfer.
1673. Robert Brook.	1776. Milne & Campbell.
1680. George Louk.	1780. James M'Ewan.
1682. Thomas Cumming.	1780. Adam Graham.
1686. James Stirling.	1780. Robert Gray.
1687. James Cumming.	1784. James Adshead.
1689. William Hodgson.	1785. James Cullen.
1693. William Clerk.	1800. — Cochrane.
1695. James Louk.	1800. Mitchell & Russell.
1717. Johan-got-helf-bilsings.	1800. A. & I. D.
1728. I. B.	1800. K.
1731. Robert Luke.	1800. J. L.
1731. Robert M'Gilchrist.	1800. I. T.
1753. James Glen.	

The names of watchmakers are not included in this list, as it does not appear that they dealt in plate. Can any of your readers furnish me with information about any of the above craftsmen, as to the time they were in business, or anything notable about them? I feel certain that the list might be supplemented very largely, and I will be glad to hear of further names. Some information about the Lukes of Claythorn would also be most acceptable. The first mention I have of the name is John Luke in the reign of Charles II., and the last, Robert Luke, in 1753. Can the dates of birth and death of the different members of the family between these years be ascertained, so that the probable time they were in business may be determined? Towards the end of last century another stamp J. L. is found. Whose is this? Should any of your numerous readers have plate in their possession of Old Glasgow manufacture, I would esteem it a favour if they would correspond with me and send me rubbings of the marks.

### FOUNTAINS ABBEY.

AT the excursion of the Yorkshire Archaeological Society, which has just been made to Fountains Abbey, Mr. St. John Hope conducted the members over the abbey, where for some time past excavations have been in progress under his superintendence, for the purpose of establishing something more than has hitherto been known or conjectured as to the disposition of the ancient abbey buildings, and the uses to which certain portions were put by the old Cistercian monks. Mr. Hope sketched the results of excavations already made, and gave an outline of work shortly to be resumed. It was not easy, he said, to discover the original disposition of the church. The popular notion was that when, in Mediæval times, people built a church like that, they intended to have a grand view from end to end. That was an erroneous opinion. They built in that manner because it was the easiest way of building, and having got their erection, they proceeded to cut it up by screens. There was no documentary evidence to tell them how the house at Fountains was divided, but the original limits of the church were different to what they were now. He could not say whether the nave and the aisles showed their original setting out. The limits of the early choir were marked out by thin lines in the grass upon the platform near where he was standing. The Cistercians seemed to have generally completed the plan of a church before going on with the other portions of their structure. The choir originally, like most Cistercian choirs, was flanked on either side by three chapels projecting eastward from the transept. The old choir must have been very dark, because there was just room for a narrow window on either side. There was very good and clear proof of walls dividing the church from end to end, and in some a



the Cistercian abbeys they were marked even more strongly than at Fountains. The evidence as to the *conversi* stalls he was not quite sure about, but three of the pillars on either side had the plinths chopped down, and his theory was that that had been done to fit the ranges of stalls. Another feature was that the aisles and the nave were cut by screens at intervals into a number of chapels. There was a chapel in almost every bay. The roofing of the aisles was peculiar. The ordinary way was to have a regular vaulting right along, but here an arch was thrown from the pillar to the wall, and then a pointed barrel vault from arch to arch. It was rather a weak form of building and not at all English in feature. There were strong indications of an organ having been erected at the west end, because against the pier there were cuts for two very strong beams and other marks. Against the west end of the choir there was a solid stone screen, with a sort of music gallery on the top. Between two screens there was a space in which sick brethren used to sit on a bench. There was a great rood screen, with images of Our Lady and St. John. In the last few days he had excavated the pits underneath the upper rank of stalls, and the total number of earthenware pots found embedded in the walls had now reached the number of twenty-four. One authority advanced the theory that they were put there to augment the sound of the music; but on the south side there were no traces of pots, and it might be that the singing was better on that side than on the north. That the central tower collapsed at an early date was clear by the buttresses. The community must have first underpinned the Norman work, and then, finding that to be of no use, had built the great buttress, which looked uglier now than when the stalls ran past it. The central tower had fallen certainly just before the suppression of the house. The great tower was one of the most imposing in the north of England. Near it was an altar to St. Michael the Archangel, with a bracket for the image of the archangel. The Norman part of the choir was utterly gone, and even of the later work there were no remains whatever. What was commonly known as the altar platform, and was supposed to have been the high altar, was nothing of the kind. The high altar was a solid piece of masonry rising through the ground, and that was not it at all. Behind this platform and underneath the Perpendicular window were the nine altars against the east wall. Each altar was divided by a solid stone wall, and subsequently the number was reduced from nine to one. The whole of these altars were screened off from one another and from the church, so as to leave a passage from end to end. Mr. Hope concluded by describing the formation and uses of the cloister, the chapter-house, the auditoria, the dormitories, the infirmary, and the cemetery.

### LONDON STREET ARCHITECTURE.

THE ideal of Mr. Frederic Harrison—"I for one," he says, "will stoutly look in the future to an ideal London, which shall boast of a silvery Thames at the Isle of Dogs, and of aqueducts, from the northern hills, as superb as the Claudian and Julian structures of old Rome; which shall reduce her death-rate to Sir Spencer Wells's goal of at least twelve per thousand, and which shall offer her citizens all that public gardens and public libraries, music, museums, and art galleries, and a beautiful architecture, can accomplish for the elevation and the refinement of their common existence"—may be a long way ahead, the *Daily News* says, and hard of attainment, but among the five millions of us there is not a croaker who will deny that it is an ideal worth striving after. Not only so, but the rate of progress is so considerable that only the vastness of London hinders people from realising its full significance.

Take the example of Oxford Street, the bald, the ugly, and the mean. At the rate at which improvements have been effected there during the last two or three years, Oxford Street will certainly become, in another twelve or fifteen, one of the handsomest of European streets. The change is especially noticeable on the south side of Oxford Street, from Tottenham Court Road to the Circus. Nearly opposite the corner of Tottenham Court Road there stands a pretty specimen of the new style of Oxford Street architecture—Messrs. Kennedy & Francis's Art Depot—the plans and elevation of which were shown in the architectural section of the Royal Academy Exhibition of 1886. Tasteful simplicity of design, congruity between architectural style and business purpose, these are its distinct characteristics. Its façade is of red brick and pale pink terra-cotta. For its narrow frontage, not the architect, but the ground landlord is responsible. Mr. Henry Heath's buildings, 107 Oxford Street, were opened nine or ten months back, and the design, like that of the art store already named, was exhibited at the Royal Academy. The architect is Mr. E. E. White. His design is admirable; the construction solid and enduring, without an inch of "jerry" building from top to bottom of it. A building of three storeys—excluding the basement, and the steep, picturesque gable, which is one of its best

features—its street elevation is constructed of the fine, strong, pale pink terra-cotta manufactured by Burmantofts, of Leeds.

It is believed by "the profession" to be one of the most successful instances of the application of this kind of terra-cotta to architectural purposes. Of ornamentation there is very little, but people with an eye for architecture will be pleased with its arrangement of wall spaces (which gives the impression of variety in unity) and with its central tiers of bow windows, surmounted by their steep picturesque gable, which, again, is flanked on either side by a balcony. The terra-cotta work of this façade shows a considerable improvement over that of the Art Depot frontage higher up the street; for one thing, the joinings between the separate pieces are firmer and finer. To South Kensington belongs the distinction of the introduction (at any rate on a large scale) of the architectural use of terra-cotta. Oxford Street, still the scorn of the critics, may boast of one or two among the most promising experiments in this costly and beautiful material. And to the credit, be it said, of those whom we may call the pioneers of the architecture of "ideal" London, they spare neither labour nor expense over their efforts. On the opposite side of Oxford Street, and not far from the houses already described, there will be opened, at the end of this year or the beginning of the next, an immense building (Nos. 26 to 32), containing a theatre, a bodega, and a restaurant, all in one. Red sandstone and Rockingham glazed brick are the materials here used. In the opinion of some admirers of this building the glazed brick is preferable—even in point of beauty—to the terra-cotta, which seems to be the favourite material among the rebuilders of Oxford Street. One may well hesitate before accepting the conclusion. But however that may be, one must admire the spirit of determination in which this particular effort has been prosecuted. The first experimental trials cost large sums of money; and now that the trials have succeeded the street elevation alone will, it is said, cost 20,000*l.* before it is finished. Each moulded brick costs fifteenpence, and is hard and strong enough to last "for ever." Expensiveness is, of course, no substitute for taste, and is admirable only when it implies thoroughness; adaptation of means to ends; utility—without which decoration can never be anything but excrescence, frivolous, impudent obtrusiveness—trash, in a word.

This vital condition, of the combination of use with beauty—beauty growing out of use, like the flower from its stalk—is well observed in the next new house which we pass. He were a hard, narrow purist who would carp at Mr. Colcutt's building—Dutch Renaissance—which shines like a good deed in the naughty world of the old, ugly Oxford Street of "Ouida's" nightmare. The street elevation of this building—Duveen's dépôt of antique and decorative furniture—is, with its pair of lofty gables, distribution of window spaces, disposition of its central projection, and alternation of red with pale orange terra-cotta, one of the finest in London. Of all the new buildings facing the street it is the most ornate. It is an admirable success, both in composition and colour. To an observer's mind it will very likely recall the Constitutional Club in Northumberland Avenue. But the styles are not identical—they are kindred. The style of the Oxford Street building is, as already said, Dutch Renaissance. That of the Avenue building is modern German Renaissance. It is exceedingly popular nowadays in the German towns; in fact, one would not be far wrong in instituting a parallel between this revived German (or Germano-Flemish) style and the Queen Anne style, of which there has been a pretty general outbreak in and about London, especially in the (æsthetic) suburb of Bedford Park, in Pont Street, in Tite Street, and in the Cadogan Square district, which even "Ouida" greets "with gratitude and hope."

As regards the new architecture of Oxford Street and its tributary streets, it can hardly be designated a distinct "style"—in the old acceptance of the word. Of course an exception must be made in the case of Mr. Colcutt's beautiful building already named. The new style, or styles, must grow—like Topsy. No architect says, "Go to! Let us invent a style." The "style" will simply be the final and artistic expression of adaptation to the new needs of body, mind, and spirit—the expression of a stage in social evolution. These new buildings, however, do possess some common characteristics. In other words, they do foreshadow the rise of a new kind of architecture—Victorian architecture it might be called, from the period of its beginnings. Between Mr. Colcutt's Renaissance house and the Classical Pantheon which flanks it on the east there is no kinship of any sort. But there most evidently is between it and the house which flanks it on the west—namely, No. 183 Oxford Street, a restaurant—a tasteful building designed by Professor Kerr, of King's College, whose drawings of it were exhibited in the Academy.

Pass by the corner of Gilbert Street, up Duke Street, round by Stalbridge Buildings, Lumley Street, through Grosvenor Square to Mount Street, and you will find many excellent specimens of a kind of architecture which seems destined, at no distant date, to transform large tracts of central and western London. The supersession of the flat, dull, and mean skylines



of the old houses by steep, bold gables and broken roofs; the employment of balconies, arcades, and projecting windows; the feeling for colour; the grouping of wall spaces, with a view to the distribution of light and shade—all these are more or less characteristic of the new Domestic architecture of London. In a few years Mount Street will become an architectural gem—especially if the suggestion of building a quadrant, or crescent, between it and Grosvenor Square be carried out. It is true that the actual builders of the Mount Street new houses are scarcely free agents, and that the ground landlord, the Duke of Westminster, is the prime mover in this process of reconstruction. Still, the duke deserves all the praise due to good taste; while, moreover, it is to be remembered that in displaying all this good taste, he has obeyed an impulse of the time.

Nothing can be more striking, in this gradual transformation of London ugly into London beautiful, than the displacement of the wretched houses on the western side of Duke Street by the present really fine range of buildings of red brick, with their basements of grey granite, pilasters of red, window casements of terra-cotta, steep, central gable, bay windows, and balconies. The Duke Street and Mount Street buildings, portioned off into sets of chambers rented at two to three or four hundred a year each, are, however, less significant of the change in public taste than the artisans' block dwellings in their immediate neighbourhood. The Stalbridge and Balderton buildings behind Duke Street are palaces in comparison with the houses which they have superseded. With the recreation-ground which, at the completion of the block now under construction, will be opened to the occupants of these blocks, this new class of "composite house" is a visible testimony to the popular craving for air, space, and light. If, again, we compare the newest block-dwellings with those which were erected at the beginning of the artisans' dwellings movement, we shall notice a continuous improvement.

In a few months there will be opened, on the Victoria Embankment, and next door to the National Liberal Club, a superb block of buildings, the style of which is believed by some professional authorities to be the style of the London of the future. This is the Whitehall Court Buildings, the architects of which are Messrs. Archer & Green—to whom, by the way, London already owes Cambridge Gate, on the site of the old Coliseum, Regent's Park; the new Arcade, in Bond Street; the Holborn Restaurant, the First Avenue Hotel, and other well-known edifices, including the immense structure at Albert Gate, concerning which there were recently certain inquiries in Parliament. The style of Whitehall Court is modern French Renaissance—an extremely versatile style, so to speak, and one which, in the hands of Messrs. Archer & Green, is revealing itself in its most imposing forms. There can be no doubt whatever that this style is admirably adapted to such a building as Whitehall Court, a gigantic palace of flats. But perhaps it were hard to tell to what extent it will pervade the future architecture of the metropolis. However, it is very certain that Whitehall Court, with its open arcades, its lofty pavilions, and its balconied storeys of white Portland stone, is one of the greatest architectural acquisitions of modern London. Together with the National Liberal Club, it constitutes a worthy adornment to one of the noblest public roads in the world. Nothing need here be added to all that has been written about the National Liberal Club, the work of Mr. Waterhouse, R.A., the same gifted artist who designed buildings so different in character to the Embankment Club House as the Natural History Museum in Kensington and Owens New College and the Town Hall of Manchester. But its neighbour, the palace of "flats," demands a word or two more. Its internal construction is a marvel of solidity and convenience. From the electric light to telephonic tubes and hydraulic lifts, no modern invention is wanting to make life easy and pleasant at the Palace.

In this quarter of riverside London, at all events, French Renaissance and the styles which most closely approach it seem destined to be the dominant styles. Between Whitehall Court and Blackfriars is another huge edifice—Savoy Mansions—which may be classed with the foregoing, and which was begun two years ago last July. The materials here used are Bath stone and glazed-ivory brick. The inner court, or quadrangle, of this building, though in the first place designed to distribute light, suggests promise of ornamental utility. Of a different style of design, but fairly in keeping with its new neighbours, there rises gradually, at the Westminster end of the Victoria Embankment, Mr. Norman Shaw's building, which is to contain the central offices of the metropolitan police—the new Scotland Yard, in fact. This building, which will in every way constitute a worthy addition to the architecture of the Embankment, will stand on a granite plinth 36 feet high. Its site is the site of the ill-starred Opera House, upon the foundations alone of which 42,000*l.* are said to have been spent. The superstructure of this new Scotland Yard is to be of Portland stone. The huge solid granite basement is well worth a visit. The granite blocks are quarried, hewn, and moulded by the convicts at Dartmoor, and, to tell the truth, their handiwork

does the convicts credit. The only building which, on the Embankment between Westminster and Blackfriars, disappoints one downright is the School Board office. It looks like a factory for crammers to turn out young minds, as elsewhere men turn out bricks and pig-iron. But one may find compensation not far off, in the City of London School—a noble building. And, again, in those houses of red Fareham brick, terra-cotta, and white Doulton stone, which Mr. John Dunn, an architect inspired by love of the dead-and-gone past, has erected at the river ends of Surrey Street, Arundel Street, and Norfolk Street. One regards their attractions with a sort of pathetic interest; for in truth, to press later Gothic, Gothic of the Tudor period, with a stamp of ecclesiasticism upon it, into the service of modern commercialism, of Niger Trading Companies—whose bags of experimental oil-nuts, soils, and cottons fill some of Mr. Dunn's rooms—does seem a little like breathing into a beautiful corpse. What with all the shields of the family of the Howards, and of all their related families, painted on all the stair windows, from top to bottom, the Duke of Norfolk's charming new houses are, as one expressed it on the spot, "a school of heraldry." But what have Niger Companies—Nigger Companies—analysing their oil-nuts, to do with heraldry? Nothing, alas! But heaven forbid that one should grumble over the substitution of the dreary, hideous brick-boxes of old, by these buildings, so distinguished by their taste and their learning. Besides, Mr. Dunn's charming houses are not entirely made over to the niggers and the nuts. The Niger Company is only one tenant; Surrey House, Mowbray House, and the rest are to let for business offices and dwelling suites.

The rival styles are various—"Queen Anne," Dutch Renaissance, German Renaissance, modern French Renaissance, and a new something that appears to be a combination of most of them. But there is, very nearly finished, in Fleet Street—corner of Chancery Lane, opposite Child's Bank—a most beautiful building, and as noble as it is beautiful, a building in quite another style (Anglo-Italian of the Classical Renaissance), and unique in London. This new structure, a branch office of the Bank of England, wins the admiration of all who see it. Its architect is Mr. W. A. Blomfield. The superstructure, of Portland stone, is raised upon a massive base of roughened grey granite—a piece of work which in itself shows originality. Red granite, from Peterhead and the north of England, is used in the simple and graceful columns, in the wall panels, and in the window spandrels. The upper main cornice is one of the finest details of a building of which purity, distinction, dignity are the essential attributes.

## MUSEUM EDUCATION.

THE report of a committee on provincial museums was presented at the meeting of the British Association by Mr. F. T. Mott. The committee were appointed to consider the ideal to which provincial museums should endeavour to attain and suggest methods for approaching that ideal. Every provincial museum ought, it was stated, in the first place, to be a fully illustrated monograph of its own district. The details of each district can be worked up more thoroughly and more cheaply by the local museums than by any other agency, and if the entire history of the district and its inhabitants is thus represented, special attention being given to any group of objects for which the district is remarkable, this will be almost as much as any local institution can accomplish. But science is daily becoming more exacting in its demands. Details which were thought ample in any provincial museum twenty years ago would now be regarded as quite insufficient. Provincial museums have made their collections hitherto in a very unsystematic manner, by donation or purchase, as opportunities occurred. In order that the scientific statistics of the country may be thoroughly investigated and made known as quickly as possible, a much more businesslike system of collection should be adopted. The district should be divided into sections and a paid collector appointed for each of them, whose whole time should be occupied for several years in obtaining specimens and records in every branch of science represented in the museum. In nearly every part of the United Kingdom competent men could be found to do this work for very moderate salaries. The necessary apparatus must be provided for them, they would generally require some amount of instruction, and during the period of their operations a sufficient staff of assistants must be employed at the museum to deal with the specimens brought in. To carry out the work in this systematic manner funds on a more liberal scale than is now usual must be provided for the first few years; but the value of the museum would be immensely enhanced, and when the local collections were made tolerably complete, the permanent income required for maintenance would be very much less. The town museum should be the place to which all students and teachers of science in the district should naturally go for assistance. To *bonâ-fide*



students every encouragement and facility should be given, and loan collections should be prepared for teachers. A system of travelling museums which circulate among the principal schools of the town has been adopted at Liverpool with great success. The practical value of museums as important factors in all adequate systems of education is not recognised by the general public. Too many of these institutions have hitherto been but toys and hobbies, and require complete reorganisation. No free rate-supported provincial museum in the kingdom has attained to the ideal recommended in this report.

### LIGHTNING CONDUCTORS.

AMONG the subjects brought before the Congress of the British Association, that of lightning conductors furnished the opportunity for a discussion, which was conducted on the respective sides by Mr. W. H. Preece and Professor Oliver J. Lodge. In the report of the conference on lightning conductors held some years back, rules were drawn up for their use and application, and have been almost universally acted upon. The use of copper was preferred to iron; perfect connection with damp earth was to be secured by plates, and the point of the conductor was to be blunt, to prevent fusion if struck; whilst all round its upper part there was to be a ring of projecting points to attract the electricity from the atmosphere, and so continuously draw the potent force harmlessly away. People have trusted to their lightning conductors, and they have paid for copper at a heavy price to insure their effectiveness. Government has ordered their use in the services, they are fitted to churches and tall edifices ashore, and are hung to the topmasts of ships at sea. Their efficiency has been relied upon, and the inmates of houses, believing in the protection of the lightning-rod, have paid little heed to storms, and gone on their different ways rejoicing. Since the decease of Dr. Mann, his widow has founded a small lectureship, and Professor Lodge has during the present year delivered two lectures. The first experiment consisted in giving the imitation lightning discharge an alternative path, or, in other words, the choice between a certain conductor and a certain length of air. From a Holtz or Wimshurst electrical machine two Leyden jars were charged, the spark flying off between the two terminals of the machine. But the outer coats of the jars were led to a second discharger, the air-space in which could be varied. To the rods of this second discharger a circuit of fine iron wire was attached, and the electrical current, or flash, had before it the choice of conduct by the wire, or of bridging spark through the air, by the hiatus between the poles of the discharger. In its first condition the only discharge obtained between the first set of terminals was a feeble and intermittent, but frequent, sparkling, very different from the loud report heard when the second set of knobs was brought within striking distance of each other. These second knobs may be at double the distance apart of the first knobs, and yet the discharge will be complete and noisy. The two sparks occur together; the first one precipitating the second. But the reverse will not take place. The experiments have been varied in different ways. Whenever the second spark was allowed to occur, the first spark was very loud; but so soon as the discharge was compelled to traverse the alternative conductor by putting the knobs too far apart for the current to bridge the gap, the noise of the discharge was much diminished, not merely because there was only one spark instead of two, but because for some reason, the discharge meets with such obstruction in the wire that its duration is lengthened. In the first experiments the length of the first spark was maintained at 1 inch; the length of the second spark was varied until it sometimes passed and sometimes missed. The alternative path was 40 feet of stout (No. 1 Birmingham wire gauge) copper rod, with a resistance to ordinary electric currents of 0.025 ohms. Nevertheless, the discharge refused to take this apparently easy path, and persisted in jumping the air, although the gap measured 1.43 inch. This is the critical distance, for if the knobs are removed further apart the discharge goes by the thick copper wire, and the noise and suddenness of the discharge are less. But if for the thick copper plate rod a similar length of fine iron wire is employed (No. 27 Birmingham wire gauge), the resistance of which to ordinary currents is 33.3 ohms, or 1,300 times as much as the other, the discharge distinctly prefers the iron wire; for if the knobs remain at the same distance apart as before, no sparks are given off, although the critical spark is increased to 1.03 inch. This is the result which has caused the surprise; for, carried out inferentially to its ultimate, it is as though a fine iron wire should be a better lightning conductor than a stout copper rod. Professor Lodge explains this astonishing obstruction offered by good conductors to the sudden rush of static electricity—that it is due to electrical self-induction. A current cannot start in a conductor instantaneously any more than water in a pipe can commence to move at full speed.

Give the water a violent blow and it resists like a solid; so with electricity, the flash occurs, and the conductor must either carry it off or not at all, for the electro-motive force required to overcome the obstruction of a considerable thickness of air may be pierced, and the charge flash off sideways to anything handy. The lightning discharge itself is, essentially, a varying current, rising from zero to a maximum, and then dying away again. There is a certain amount of energy to be dissipated. It may be that the rush of electricity does not suffice to get rid of all the stored up energy of the charged cloud. If the conductor be resisting, the single rush may suffice; but, if it be a good conductor, its capacity may be insufficient. The same would happen then as with compressed air, or water running out of an orifice. If a wide, free mouth be suddenly opened, the escaping air oscillates until the stored-up energy is spent. Remembering the rapidly-oscillating character of an electric discharge, and the fact that a rising current begins on the outside of a conductor, no current under a certain rate of alternation would be able to penetrate much, if at all, below the surface; and thus, in this outer pellicle, the electricity will oscillate to and fro, whilst the interior of the conductor will take no part in the action. It must, therefore, Professor Lodge urges, be better not to make a lightning conductor of a rod, but to flatten it out into a thin sheet, or draw it out into detached wires. Any plan, indeed, for increasing surface, and spreading it out laterally, will be an improvement. This resistance the professor prefers to call "impedance," for resistance proper transforms the current into heat, while the obstruction referred to impedes the electrical discharge, and originates a tendency to side flash. The greater the "impedance" in a conductor, the less able is it to carry off the flash. The oscillating action on the conductor, which gives tendency to the flash to escape to any contiguous conducting substance, such as bell wires, gas and lead pipes, roof gutters, may give rise to serious accidents. Gas may, for example, be ignited by the fusion of its pipes. The inference from these experiments is that the lightning conductors would be best constructed of barbed wire, the wire not being so thin as to be deflagrated by the lightning flash.

Mr. Preece argued that if we wanted to know anything about atmospherical electricity, we had to go back to the works of Benjamin Franklin, 100 years ago. Up to 1870 there were absolutely no rules for the guidance of those who desired to erect lightning conductors for the protection of buildings. In that year a great conference was held on the subject, and the result of its deliberations was published in a book, and included a set of rules for the construction of conductors. We had since had great experience of them. He had under his supervision no fewer than 500,000 lightning conductors. Some time ago a lectureship on atmospherical electricity was founded in memory of Dr. Mann, who experimented on the protection of buildings in South Africa. Professor Oliver J. Lodge was selected as the lecturer, but instead of cracking up the work of the conference, he took the other line; and if his statements were true lightning conductors would be of no use, and no buildings would be safe in a thunderstorm. Professor Lodge had committed himself to fallacies which it was now his duty to bring before the meeting. The professor assumed that a lightning-rod formed part of the flash. Well, it did not. Nobody had ever seen a flash of lightning strike a conductor. The function of a conductor was to prevent the possibility of the building being struck by the flash. If it should be struck, there was some defect in the construction of the conductor. Lightning did not go careering wildly about, but passed along a path prepared for it. There was another fallacy, viz., that a flash of lightning was instantaneous. There was no proof of that. We saw a flash of light, which indicated part of the discharge, but how long the discharge lasted we did not know. There were invisible flashes of lightning, which was proved by the fact that persons had been killed under trees when there was no visible flash. He, however, came to that conclusion from the effect on telegraph wires, when there were currents of sensible duration, showing that the flash was not instantaneous. The next part was hardest to discuss. It was the assertion that lightning was oscillatory in its character; that it did not go direct from the cloud to the earth, but went flashing backwards and forwards with considerable frequency. This assertion was based more on mathematical reason than on absolute observation, and engineers had no great respect for mathematical development unless it were confirmed by absolute experiment. The facts against the theory were that electro-magnets were affected for a considerable duration of time by lightning flashes. Iron and steel were affected, and he had heard letters of the alphabet signalled along the telegraph wires by a flash—the letter R which needed three signs, C which needed four, and there was a case on record of G which needed eight signs. Under those circumstances the flash could not be oscillatory unless the oscillations were very infrequent. A discharge from condensers or Leyden jars might be oscillatory, but they were dealing with flashes of lightning. While he was attacking Professor Lodge in that way he must say that no one had worked harder or more honestly in the matter. Professor Lodge had made experiments, and they



were correct, from which he deduced that the self-induction of copper was greater than that of iron. He also had made similar experiments, but with just the opposite result. But though the experiments made by Professor Lodge might seem to tell against existing theories, he believed the professor was on the eve of a discovery that would widen our knowledge on the subject. He had started a fresh hare which electricians must follow up and kill. Self-induction was called up to explain all the phenomena which they did not understand, and he inclined to think it was very much what the Americans called a bug. In the telegraph science they had known it for many years, and called it electro-magnetic inertia. The next fallacy was that most conductors did not protect any area, but it was known from evidence that they did. He preferred to stand upon the experience of the past rather than upon Professor Lodge's mathematical assumptions. There was a tendency to hasty generalisation among mathematicians, but there could be no doubt that the experiments of Professor Lodge and others were opening their minds to the true nature of electricity, and that they would in time be able to speak of the mechanical character of electricity. They wanted to know where the energy came from which was so destructive in a flash of lightning. Aqueous vapour condensed and falling as rain at the rate of one millimetre per acre per hour developed an energy of 600 horse-power per acre. There was the creation of the energy which only wanted further development to turn into a source of electrical energy. He felt convinced that the result of that discussion would be to establish the truth of the position taken up by the Lightning-Rod Conference, and would bring to the front what they were all anxious to see, the true theory of electricity shadowed forth by Professor Fitzgerald in his opening address, and that would make this meeting an epoch in the history of electricity.

Professor Lodge said he had no lightning conductors under his supervision and all his conclusions were formed from experiments, and if they were correct very few buildings were effectively and thoroughly protected at the present time; and, further, if his views were correct, lightning-rods would in the future cost very much less than now. The term electro-magnetic inertia seemed to imply that they knew more than they did, so he preferred self-induction until they attained to knowledge. He replied to the assertion that no protected building has been struck by lightning by citing the case of the Hôtel de Ville, Brussels, which was recently struck and set on fire by lightning, although its roof bristles with lightning-rods put up on the present approved form. He affirmed that iron rods are quite as efficient as copper ones; and inasmuch as they are a great deal cheaper they might be more extensively used. He has found in many cases that buildings are left without any lightning conductors, because it is cheaper to insure the buildings than to furnish them with lightning protectors. He had made some careful experiments in which he provided alternative courses for an electric current, and he found that it required less electro-motive force to send the current along a thin iron wire than along a thick copper one. The object of the conductor was to prevent a flash of lightning, but wires were struck and melted. The conductor had two functions to perform—to act as a point and prevent a flash if it could and to carry off a flash when it could not help receiving. The electricity before had some energy. It might be better to let it dribble away slowly down a bad conductor than to let it rush headlong down a good one. The length of flash was a question for the consideration of meteorologists, and the duration of flashes was a point on which the same gentlemen might do good work. He had seen flashes which appeared to last two or three seconds, but he thought they must have been a succession of flashes. The fact that flashes deflected the compass needle did not prove that they were not oscillatory, nor did it prove anything as to their duration. A short powerful flash might produce the same effects. There was the question of a flash magnetising a bar of steel. An oscillating current ought not to do that. Professor Ewin used an oscillating current to demagnetise steel. The charging of a Leyden jar illustrated the oscillating current. The charging was like lifting a rod suspended freely at one end to a horizontal position (the rod representing the charge). When the jar was discharged it was like releasing the rod; it must oscillate, and so must the electricity, and its oscillation would vary in accordance with the friction and other modifying causes. The greater the electro-magnetic inertia, the greater the oscillation. With regard to the protection of areas, the area which Mr. Preece admitted he protected was so small that they might give it him without discussion. There was, however, in his opinion no sure area of protection. Mr. Preece might have pressed him hard on the question of the conditions of a flash. He (the speaker) had assumed that the flash behaved as electricity did in an experiment. The cloud, however, was not like the tinfoil of a Leyden jar; it was made up of atoms with spaces between them, and a discharge might be more like that of a spangle jar, or might be dribbled away a bit at a time and not by great rushes. But

they could not assume that it would always do so, and must prepare for the occurrence of a great rush. The true character of lightning must be discovered by observing lightning, and not by experiments in a laboratory. The spark of one induction coil at a considerable distance would start another one sparking merely by its light. From that he came to the conclusion that when there was a very bright flash of lightning it must involve very important consequences. There was no doubt that it would cause discharges all over the charged area, and so he would say that areas of protection were misleading, and if a flash had that effect they had better be without any conductor at all.

The Hon. Ralph Abercrombie said there was no absolute evidence in photographs of flashes of lightning following each other rapidly on exactly the same path. There was, however, distinct evidence of the tendency of lightning flashes to occur parallel to each other. There seemed to be a tendency in lightning flashes to be ramified, to give off threads all round the main flash. Photography gave conclusive evidence that flashes were not so instantaneous as was generally supposed. It showed that the flash did not jump from a cloud straight to the earth, but went meandering through the air and tying itself into knots, so that it could not be so instantaneous as was imagined. He was of opinion that lightning clouds were generally more than 5,000 feet high, but there was no evidence of one of more than 7,000 feet high.

Lord Rayleigh said he thought that Professor Lodge's experiments would be a most important practical appreciation of lightning conductors in the future. Mr. Preece spoke of the development of energy by the condensation of vapour into water, but the question was to find how some of that energy came to take the electrical form. He believed that if Professor Lodge proceeded with his experiments, he would confirm his discovery that iron wire was a better conductor than copper. Self-induction was in the air, and they were talking of nothing else. He thought Mr. Abercrombie's idea as to the duration was correct. It seemed to him probable that it was the sound of one spark which caused another rather than the light. There was the photograph giving three parallel flashes. It would be well if some experiments could be made to discover whether flashes occurring like that were simultaneous or followed one another, being started by the light or sound vibrations of the first. It was rather startling to find that a lightning-rod had protecting power over so small an area, and he would like to ask Mr. Preece whether copper had been experimentally proved to be better than iron. They could come to one conclusion from what they heard, namely, that houses made of sheet-iron would be the safest possible places in a thunderstorm. The question of the effect of self-induction on static discharges was a very important one. He suggested as a class experiment the discharge of a Leyden jar through a number of students (1) when they were arranged in zigzag rows, so as to have no self-induction in the path of the discharge; and secondly, when they stood in a circle so that the self-induction of the path was a maximum. The students should stand on insulating material. He thought the result of such an experiment would be to show that the students in the middle of the chain would feel the effects of the discharge far less in the second instance than in the first. The most efficient protection for gunpowder against lightning would be, he thought, to put it in a house whose exterior was entirely of iron, and to put no lightning-rod on it.

Professor Rowland observed that the conditions of Professor Lodge's experiments were scarcely the same as those of actual lightning, and he pointed out that the length of the spark was no measure of the resistance of the conductor. Further, he showed some effects in Mr. Abercrombie's photographs, which were probably due to the astigmatism in the lens of the camera.

M. de Fonvielle said he, with Mr. Preece, was a supporter of the old lightning conductor theory, and he was partly led to that state of mind by the fact that there were large numbers of conductors in Paris, and there was very seldom an accident caused by lightning.

Professor G. Forbes said that Mr. Preece did not mean to say that mathematicians came to wrong conclusions when they had all the right data, but that they sometimes came to a conclusion without taking all the data into consideration. Professor Lodge had come to say that if iron was not better than copper, it was at least as good; but they could not be quite prepared to accept that, because the experiments might be tried in instances more nearly approaching the natural conditions, and in that case they believed copper would be found to be the best.

Sir J. Douglass said that his experience of lighthouses protected by lightning-rods covered a space of forty years, and was comforting to the members of the Lightning-Rod Committee. He never knew a rod fulfilling the conditions he prescribed to fail in protecting the lighthouse.

Professor Crum Brown suggested the use of revolving camera in taking photographs, in order to separate flashes, and thus see if each is single or not.



Mr. Sidney Walker said in the cases where damage had occurred, he believed that the result was due to a defect in the conductor. He pointed out iron would not stand the weather so well as copper, and that, besides, it would be affected by the gases at the top of a factory or similar place.

Mr. G. J. Symonds said he had investigated every accident by lightning of which he could hear, and had so got valuable experience. The conclusion left on his mind was that, if people would erect conductors precisely in accordance with the rules laid down by the conference, and fulfilling all the conditions, they would be absolutely safe.

Dr. Walker said he saw an obelisk on top of a hill struck. The top was knocked off and the fluid came from the steps of the monument at fourteen different points, ploughing up the ground, and breaking rock at 100 feet distance.

Professor Lodge said he could not understand why a conductor should have such a good earth. Why did not three points do at the bottom as well as at the top? He could not say that conductors were of no use; they were of great use, but not absolutely certain. In his experiment he was bound to adopt the plan he did, because the experiment could not be done in any other way. It was only the outer surface of the conductor which conducted, and he did not know that there was any good in the centre of a rod. A tube would do as well and would be all the better if opened out into a flat bar, and yet, better than that would be a strand of wires. Iron buildings, to be safe, must have perfect connections, for the smallest gap might give off a spark. That was the danger in houses supplied with gas; if the fluid travelled along the pipes and came to a gap a spark and explosion might result.

Mr. Preece said the points between Professor Lodge and himself were reduced to a very small compass indeed. He himself had always been a great advocate of iron on account of its cheapness. The use of copper caused needless expense in the erection of lightning conductors. He believed every private house could be protected in accordance with the recommendations of the conference for 1*l.*, if people would buy a coil of stranded iron wire a quarter of an inch in diameter with the final points, and have that put up.

#### MALDON.

A VISIT was made to Maldon by the Essex Field Club on Friday and Saturday last. At one of the meetings held in the Moot or Town Hall, a lofty red brick building, erected in the early part of the fifteenth century by Sir Robert D'Arcy, M.P. for Maldon in 1422, the Mayor, Mr. E. A. Fitch, read a paper under the title of "Short Notes on the History of Maldon." The town, he said, was founded nearly a thousand years ago—913-920 A.D.—by Edward the Elder, who chose for the site of his castrum a place formerly occupied by the Romans, but successively desolated by the Saxons and the Danes. Of Roman Maldon little was known, but the probabilities were that it was not a place of military importance; its claim to having been the Colona Camulodunum, and previously the royal town of Cunobelin, the capital of the southern part of the islands, could not be substantiated, but must be conceded to Colchester. Roman bricks, pottery, and coins had been found at various times in the neighbourhood. Truck loads of pottery had been turned up in the excavations for the new railway. A valuable gold coin found in and belonging to the town was shown. It was in good preservation, of the time of Agrippina junior and Nero, with their two heads on the obverse, and a male and female figure in a quadriga of elephants on the reverse. About the only record of Saxon Maldon was its name, from Mæl, across, and Dun, a hill. Although there was no history of the Danish conquest of Essex, it was known that here was one of the chief seats of the Danish power. In 921, after the massacre of Colchester, a large army of Danes unsuccessfully besieged the "Muldune" camp, and were repulsed with great loss by the Saxons. In the year 993, the Saxon Chronicle recorded that "this year came Unlaf with 93 ships to Staines, and laid waste all around, and thence he went to Sandwich, and thence to Gypswic (Ipswich), and harried it all, and so to Mældun, and then Brihtnoth, the Ealdorman, and his force came against him and fought with him, and there they slew the Ealdorman, and kept the battlefield. This great battle lasted for fourteen days, and there was a contemporaneous epic ballad describing it, which had been ranked "among the noblest efforts of Teutonic poetry." At the time of the Domesday survey, Mr. Fitch said, Maldon was a half hundred, like Ipswich. The borough belonged to the King, and the hall and houses were rented to the burgesses. The oldest charter dated from 1155, and was confirmed by Edward I., and as they were exempted from the usages of feudalism, which then pressed so hardly on the rest of the country, a Maldon freeman felt himself indeed a citizen of a great city. Having traced the later history of Maldon, when

the borough was shorn of some of its administrative privileges, the Mayor concluded by saying they would all wish that the ancient and loyal borough, which had left its mark on the history, especially political, of the county, might long continue to flourish.



#### Theatre Exits and Fire Risks.

SIR,—Having observed in the recent issues of your paper a number of letters on the above subject, and in one last week a request that I should explain the construction of the proscenium curtain for which I have obtained a patent, I submit the following particulars:—

The curtains are manufactured, under my patent, by Messrs. Clark, Bunnett & Co., Limited, and have been fitted up at the Theatre Royal, Eastbourne; the Alexandra, the Court, and the Shakesperian Theatres, Liverpool; and are now being fitted up at the Shaftesbury and the Lyric Theatres, London—the two last theatres now being erected from the designs of Mr. C. J. Phipps, F.S.A.

Perhaps I may be excused if I submit that this curtain is constructed in a manner as to afford the greatest protection against fire and the influence of heat; against smoke, the evil effects of which do not appear to be sufficiently recognised and against the falling timber or *débris*, which naturally takes place even at the commencement of a fire on a stage in cutting away scenery, &c.

The frame consists of a combination of T and L iron, running in a channel iron, which is fixed against the proscenium wall; this gives a fairly smokeproof joint, a matter of considerable importance. The outer frame of T iron is connected together with tubes and an interlacing of iron rods, and these are again strengthened by diagonal bracing, thus making the whole frame rigid, a matter of importance in a flat surface, say 35 feet square. To protect the ironwork from the influence of heat the whole is filled in and covered with "silicate cotton" or "slag wool," making a solid and rigid partition about 3 inches thick, fire-resisting as well as a non-conducting medium of heat and sound. The exterior is protected and stiffened by wire netting on each side, and the one towards the auditorium covered with green baize or any decorative treatment. Some of the curtains are worked by hydraulic power, others by hand power.

For the benefit of those who are not acquainted with the material "silicate cotton," I would observe that it is a fibrous product of blast-furnace slag, and is, from the nature of its formation, the best-known incombustible non-conductor of heat. I say "incombustible," as hair felt is an almost perfect non-conductor, but not fire-resisting, and so is left out of consideration.

Before deciding to employ "silicate cotton" I made a series of experiments, and came to the conclusion that it was the most effectual material which I could employ for the purpose, and from the experiments which were carried out in Southwark some time since my views have been confirmed in a manner most satisfactory, and I may say I look with some interest to see how the material will be taken up by the building world in general.

So much for the curtain which has been constructed according to my ideas. It is practically fireproof, smokeproof, heatproof, and soundproof; and if these facts were put before the theatre-going public, and they would only recognise them, one step would be gained towards the desired object, viz. that of avoiding panic, a far greater evil than fire, smoke, narrow passages, or bad staircases. To minimise the chance of panic I think the curtains already erected should be used more frequently between every act, so that even in the event of fire, and the curtain being lowered, the audience might not get what I may call "a scare," and, although they would be quite safe from fire, not understand it, and so make a stampede for the doors, with the result that some at least would be injured. I trust my description will be clear to your correspondents and that I have not been too long-winded in my views. Of course, in the progress of events, better curtains will be made some day, but at present I should prefer "the Protected Curtain" to be between a fire on the stage of a theatre and your obedient servant,

MAX CLARKE.

2 John Street, Bedford Row, W.C. :  
September 19, 1888.

[This correspondence will now cease.—ED.]

Sir George Stephen has announced his intention of building and endowing a cottage hospital at Dufftown, his native town, for the benefit of Mortlach and Glenrines parishes.



## NEW BUILDINGS.

**Coventry.**—Ground has been broken for laying the foundations of the proposed new theatre in Hales Street, Coventry, for Mr. William Bennett. The plans have been prepared by Messrs. Essex & Nicol, Birmingham, and Mr. C. Gray Hill, builder, of Coventry, has secured the contract for the erection of the building, the cost of which is estimated at about 4,000*l*. The area of the main body of the building will be 108 feet by 66 feet, in addition to which there will be refreshment-rooms and other conveniences. The stage will be 73 feet wide by 27 feet deep, with a good proscenium 24 feet wide. To the ground floor there will be three entrances from Hales Street, with a side entrance and a stage door; and there will be four staircases to the upper parts of the house and galleries. The size of the pit will be 48 feet 3 inches by 53 feet 9 inches.

**Glasgow.**—The memorial-stone of the new buildings for the Dennistoun Evangelical Union Church has been laid. The buildings, which are designed by Mr. Malcolm Stark, jun., I.A., Glasgow, are in the sixteenth-century Scottish style, in Ballochmyle red stone, and cost about 2,600*l*. The church, which will be handsomely finished, will accommodate about 550 sitters, and it will be provided with the usual halls, classrooms, &c.

**Harrogate.**—The foundation-stone of a Church Institute has been laid. The building is being erected under the superintendence of Messrs. H. E. & A. Bown, architects, of Harrogate. The style of architecture is late Gothic, the ashlar or stone used for the dressings is from the Killinghall quarries, tooled on the face; the wall stones are from the Rainton quarry, near Thirsk, skin bosted on face, and are laid in narrow courses. These being of a reddish colour are a strong contrast to the ashlar, which is nearly white, and give warmth and colour to the building.

**Sidmouth.**—New business premises for the Devon and Cornwall Banking Company at Sidmouth have been completed. The old quarters on the Esplanade proved inadequate to accommodate the increased business, and the new premises were consequently purchased. Important and extensive alterations were made from the designs of Mr. E. Lyne Parsons, of Exeter. The work has been done by Mr. M. W. Critchley, of Sidmouth.

**Tooting.**—A Roman Catholic college, erected on the Hill House estate, adjoining Tooting Graveney Common, has been opened. The highest point on the estate has been selected for the college buildings, which cover a ground area of 20,000 square feet, and rise in four storeys to a height of 74 feet. The buildings are in red brick and Portland stone dressings, the style of architecture being the French Renaissance. The buildings have a frontage of 196 feet, the central block being 130 feet in length and 52 feet in width, while the wings are 123 feet long and 33 feet wide. The chapel, on the first floor, is 80 feet long, 30 feet wide, and 35 feet high. The altar is in Caen stone, the altar table being of white veined marble, supported by four pillars of Irish marble. The building is heated by hot-water pipes, extending to a length of 2½ miles. The college has accommodation for 200 resident students and as many day students. Mr. W. Harvey, of Whitehall Place, is the architect, and Messrs. Higgs & Hill the contractors.

## CHURCH BUILDING AND RESTORATION.

**Edinburgh.**—A Roman Catholic church is to be erected in Upper Gray Street, and among the plans sent in in competition, those submitted by Mr. Rhoderic Cameron, architect, 130 George Street, Edinburgh, have been selected. The style of architecture adopted is a free treatment of Classic Renaissance.

**Lochearnhead.**—An Episcopal church erected at Lochearnhead has been opened. Mr. G. T. Ewing, Crief, is architect, and Mr. Angus, Lochearnhead, mason; Messrs. Taylor & Co., Blackford, joiners; slater, Mr. Williamson, Muthill.

**Rockwell Green.**—The foundation-stone of the new church has been laid. The church on plan is cruciform, 89 feet being the total length, and the width at the arms of the cross 50 feet, the height of the tower being 67 feet from the ground to the top of the pinnacles. The building will be of a substantial character, the walls generally being 2 feet 3 inches in thickness. The wall at the west end of the nave is to be 3 feet, while the walls of the lower stage of the tower are to be 3 feet 6 inches thick. The original contractors were Messrs. Verrier & Son, of Taunton, who obtained the contract in open competition, 2,765*l*. being the amount of their tender for the church, exclusive of the tower. Subsequently, on the failure of Messrs. Verrier, the contract was given to Mr. W. Templeman, also of Taunton. The architect is Mr. J. Houghton Spencer, of Taunton.

The New Guildhall at Nottingham is to be opened on Thursday next.

## GENERAL.

**Sir Frederick Leighton, P.R.A.**, arrived last week in Braemar, where he will probably make a lengthened stay.

**A Picture** by Teniers, worth about 1,000*l*., has been stolen from the Brussels residence of the Princesse de Ligne.

**The First Annual Exhibition** of the South Wales Art Society opened on Saturday with an admirable collection of pictures. The hanging committee were Mr. Parker Hagarty, R.C.A., Mr. S. W. Allen, A.R.C.A., and Mr. J. A. Sant, hon. sec., the general arrangement of the hall being carried out under the supervision of Mr. Edwin Seward.

**A Town Hall**, erected at Elland, from the designs of Mr. C. F. L. Horsfall, of Halifax, was opened on Wednesday. The building has cost 7,000*l*., and in the main hall there is accommodation for over 1,000 persons.

**Mr. Williamson, M.P.**, has offered 5,000*l*. towards the building fund of a new infirmary for Lancaster, and a site is to be purchased without delay. The infirmary is likely to cost from 10,000*l*. to 15,000*l*.

**The Church** of St. Michael and All Angels, Queenstown, Cape Colony, is to be extended by the addition of north and south transepts with porch, and raising of central tower. The nave portion was erected in 1882 from a design selected in competition, and furnished by Mr. W. H. Reid, of Standard Bank Chambers, Port Elizabeth, who has supplied plans for the present addition.

**A Memorial Archway**, designed in Greek style by Mr. Sydney Mitchell and carried out in red Dumfriesshire sandstone, has been erected at Blackford Hill, Edinburgh, to commemorate the late Sir George Harrison, formerly Lord Provost of the town.

**Messrs. Edwards & Sons**, Wolverhampton, have offered a prize of five guineas for the best landscape or figure-painting in oils of local origin, at the exhibition, which it is expected will be opened by Lord Dartmouth next week.

**The Scheme** for founding a Technical School for Bolton has been revived. Some time back the committee of the Bolton Mechanics' Institute offered to give their building, an offer equivalent to 5,000*l*., for the purpose.

**Mr. W. Oldham Chambers, F.R.I.B.A.**, has been appointed president on the jury of pisciculture at the Brussels Exhibition.

**Plans** have been prepared for a school to accommodate 250 boys, to be erected on a site purchased by the Exeter School Board from the trustees of Sandford's Charity.

**A Bazaar** was held last week in aid of the funds for restoring Ratlinghope Church, Salop, an ancient and interesting structure.

**The Grammar School**, at Stroud, after undergoing alterations and fitting up at a cost of 700*l*., was reopened on Saturday as a Free Library, in commemoration of the Queen's Jubilee.

**Mr. W. Leonard Grant**, architect, Sittingbourne, has drawn up a report after inspection of the condition of Milton-next-Sittingbourne parish church, the restoration of which it is proposed to take in hand.

**The Tunstall Jubilee Committee** have accepted tenders from Mr. T. Goodwin, of Tunstall, for the erection of a school of art for the sum of 4,135*l*., of the new baths for 3,890*l*., and of a town yard for 927*l*.

**A Bridge** over the river at Hull has just been opened, the cost, with approaches and property taken, being about 30,600*l*. It forms a direct means of communication between the centre and principal business portion of the town, and the main thoroughfare leading to the Victoria and Alexandra Docks, and is expected to relieve the traffic between the east and central districts of the town, which formerly had to pass over the North Bridge, higher up the river.

**The Excavations** commenced by Dr. Schliemann at Mycenæ are still being energetically carried on, and continue every day to bring to light fresh objects of archaeological interest. The entire terrain around the town is full of tombs belonging to an epoch antecedent to Homer. These pre-Homeric sepulchres are cut in the solid rock and carefully formed in regular compartments, with an area of from thirty-five to forty square metres. Articles of glass, crystal, and ivory, besides precious stones with engravings of animals charmingly executed, the character of which suggests that the ancient Greeks derived inspiration from the East, have been found.

**The East London Water Company** has been fined 5*l*., and in addition 20*s*. for nine days and costs, for not putting on a supply to two houses belonging to Mr. H. Johnson, of Limehouse, the reason for their refusal being that there was no storage cistern in either house. Mr. Lushington, however, decided that the cisterns, as provided with water-waste preventors, were sufficient receptacles for water.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, SEPTEMBER 21, 1888.

## THE ARCHITECT AND CONTRACT REPORTER.

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*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.  
No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.  
Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

### CONTRACTS OPEN.

**BELFAST.**—Sept. 24.—For Building Tower and Spire to Catholic Church, Holyrood. Mr. M. H. Thomson, Architect, 65 Upper Arthur Street, Belfast.

**BIDEFORD.**—Sept. 21.—For Widening Quay. Mr. Henry Chowins, Borough Surveyor, Bideford.

**BLACKFRIARS.**—For Building Shop and Premises. Mr. Thomas F. Shaw, Architect, Harlesden, N.W.

**BURNHOPE, DURHAM.**—For Building P. M. Chapel. Mr. W. T. C. Hallam, Architect, 56 Westgate Road, Newcastle-on-Tyne.

**BURTON-ON-TRENT.**—Sept. 27.—For Extension of Board Schools, Victoria Road and York Street. Mr. Reginald Churchill, Architect, St. Paul's Square, Burton-on-Trent.

**CLEATOR MOOR.**—Sept. 28.—For Alterations in Birks Road. Mr. J. S. Moffat, Architect, 53 Church Street, Whitehaven.

**COLYTON.**—Sept. 24.—For Alterations and Repairs to the Colcombe Castle Hotel. Messrs. Pinney, Son & Farmer, Architects, Axminster.

**DUBLIN.**—Sept. 25.—For Construction of Four Iron Street Bridges. Mr. E. Maunsell, Secretary, Westland Row Terminus, Dublin.

**EXETER.**—Sept. 24.—For Construction of New Drainage Works at the City Workhouse. Messrs. Wilkinson & Warren, Surveyors, Post Office Chambers, Exeter.

**EXETER.**—For Alterations at the Half Moon Hotel. Mr. E. H. Harbottle, Architect, County Chambers, Exeter.

**FARSLEY.**—Sept. 21.—For Building Stockrooms, Offices, &c. Mr. C. S. Nelson, Architect, Albert Chambers, Park Row, Leeds.

**FELTWELL FEN.**—Sept. 29.—For Building Board School, &c. Mr. E. N. Cole, Bury Road, Thetford.

**FINSBURY PARK.**—Oct. 2.—For Building Store Shed. The Superintending Architect, Metropolitan Board of Works, Spring Gardens.

**GREAT WAKERING.**—Sept. 21.—For Additions, &c., to Board Schools for 120 Children. Mr. Walter J. Wood, Architect, 1 Sussex Terrace, Southend, and 1 Finsbury Circus, E.C.

**HALIFAX.**—Oct. 1.—For Building Restaurant, Southgate. Messrs. Jackson & Fox, Architects, 22 George Street, Halifax.

**KESWICK.**—Sept. 28.—For Enlarging Chancel and Building Organ Chamber, St. John's Church. Mr. W. Marshall, Architect, 28 Bedford Square, W.C.

**LLANELLY.**—Sept. 28.—For Building Sunday Schoolroom. Mr. H. Dawkin Evans, The Graig, Llanelly.

**LLAMSHEN.**—Sept. 24.—For Building Two Residences. Mr. W. I. Grylls, Architect, 65 St. Mary Street, Cardiff.

**MANCHESTER.**—For Parish Rooms, St. Matthew's, Ardwick. Mr. Medland Taylor, Architect, 2 St. Ann's Churchyard, Manchester.

**NEWCASTLE EMLYN.**—Sept. 30.—For Building House. Mr. J. Jones, Lloyd Terrace, Newcastle Emllyn.

**NEWCASTLE-ON-TYNE.**—Sept. 24.—For Alterations to Premises, Scotswood Road. Messrs. S. Oswald & Son, Architects, 2 St. Nicholas Buildings, Newcastle-on-Tyne.

**NORTH SHIELDS.**—Oct. 3.—For Construction of Passenger Station. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

**OSSETT.**—Sept. 28.—For Building Offices, &c., Bottom Field Mills. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

**PETERBOROUGH.**—For Building Three Cottages. Mr. J. G. Stallebrass, Bamber Street, Peterborough.

**PETERBOROUGH.**—For Building House in Broadway. Mr. H. M. Townsend, Architect, The Precincts, Peterborough.

**QUEENSBURY.**—Sept. 29.—For Combing Shed at Bradshaw Mills. Mr. John Drake, Architect, Winterbank, Queensbury.

**RATCLIFF.**—For Building Block of Warehouses, London Street. Mr. Joseph Sawyer, Architect, 63 Chancery Lane, W.C.

**RISHWORTH.**—Sept. 24.—For Building Cottage at Waterworks. Mr. C. J. Hudson, Town Clerk, Wakefield.

**ROMFORD.**—Sept. 24.—For Reconstructing Fittings and Drainage Works at the Workhouse. Mr. C. J. Dawson, Architect, East Street, Barking.

**ROTHERHAM.**—Sept. 28.—For Building Grain Warehouse. Mr. E. Ross, Secretary, London Road Station, Manchester.

**SALCOMBE.**—Sept. 22.—For Building Chancel and Porches to Church. Mr. J. May, Courtenay Street, Salcombe.

**SCARBOROUGH.**—Sept. 21.—For Building Three Cottages, Quay Street, Sandside. Mr. John Petch, Architect, Bar Street, Scarborough.

**SEATON SLUICE.**—Oct. 5.—For Building Two Coastguard Houses. The Director of Works Department, Admiralty, 21 Craven Street, Charing Cross.

**WEST BECKHAM.**—Sept. 22.—For partly Rebuilding Workhouse. Mr. J. S. Plumbly, Southrepps.

### TENDERS.

#### ALDERSHOT.

For Carrying Out Shone's System of Drainage for Western Portion of Aldershot. Mr. W. L. COULSON, Surveyor.  
Hughes & Lancaster, Chester . . . £1,000 0 0



**AXMINSTER.**

For Alterations and Additions to the Red Lion Hotel, Axminster, for Messrs. S. & W. T. Toms, Brewers, Chard. Messrs. PINNEY, SON & FARMER, Architects and Surveyors, Axminster.  
Parsons & Perryman, Axminster . . . . . £68 1 6

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For Altering and Remodelling First Presbyterian Church, Ballibay.  
J. Irwin, Ballibay . . . . . £340 0 0  
W. WATSON, Castleblayney (*accepted*) . . . . . 321 0 0  
J. Maguire, Newtonbutler . . . . . 288 0 0

**BRADFORD.**

For Erection of Five Houses and House and Shop at Laisterdyke. Mr. G. C. GAMBLE, Architect, 225 Leeds Road, Bradford.

*Accepted Tenders.*

W. Totty, Manningham, mason.  
Wilkinson & Kellet, Horton, joiner.  
Hill & Nelson, Bradford, slater.  
M. Slinger, Bradford, plumber.  
T. Bolton, Bradford, plasterer.  
F. Clapham, Bradford, painter.

For Additions to Laisterdyke Post Office. Mr. G. C. GAMBLE, Architect, Bradford.

W. Hinchcliffe, Thornbury, mason.  
Schofield & Gibson, Thornbury, joiner.  
Hill & Nelson, Bradford, slater.  
W. Watson, Laisterdyke, plumber.  
J. Wheeler, Laisterdyke, plasterer.

For Alteration of Old Post Office Buildings into Shop and Offices, for Messrs. G. Brown & Son. Messrs. MILNES & FRANCE, Architects, Bradford.

*Accepted Tenders.*

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Wilson & Son, Bradford, joiner.  
Taylor & Parsons, Bradford, ironfounder.  
A. Barber, Bradford, plumber.  
P. Holdsworth, Bradford, plasterer.  
T. Nelson, Bradford, slater.

**BRENTFORD.**

For Widening Windmill Road. Mr. LACEY, Surveyor, Brentford.

G. Gibson, Southall . . . . .	£965	5	0
Gregory & Co., Clapham . . . . .	857	0	0
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T. Anthony, Brentford . . . . .	759	14	4
G. Bell, Tottenham . . . . .	752	12	1
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J. Barnes, Brentford . . . . .	729	3	6
Rackham & Co., Colchester . . . . .	715	0	0
C. Beach, Brondesbury . . . . .	694	16	3

**CHELMSFORD.**

For Erection of Vestry Hall in New Street, Chelmsford, for the Parish Officers. Mr. F. WHITMORE, Architect.

H. Potter . . . . .	£476	0	0
C. J. BAKER * . . . .	456	0	0
A. Roper . . . . .	455	0	0
G. Beaumont . . . . .	432	0	0
Mrs. Moss . . . . .	429	0	0
W. Fincham . . . . .	419	0	0
Frank Johnson . . . . .	377	0	0

\* Accepted from revised plans.

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R. & G. Cussen, Templemore . . . . .	2,453	0	0
J. Newstead, Fermoy . . . . .	2,424	10	0
W. T. Mackey, Donoughmore . . . . .	2,407	0	0
D. Creedon, Fermoy . . . . .	2,291	6	8
T. Williams, Borrisoleigh . . . . .	2,240	0	0
P. DWYER, Clonmel ( <i>accepted</i> ) . . . . .	2,134	3	3

**DORCHESTER.**

For Laying Sewer in Weymouth Road, Great Western Road, and Cornwall Road. Mr. F. T. MALTBY, C.E., Borough Surveyor, Dorchester.

H. Testy, Weymouth . . . . .	£268	0	0
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A. F. James, Cleethorpes . . . . .	1,618	0	0
Hewins & Goodhand, Grimsby . . . . .	1,389	10	0
F. ENDERBY, Grimsby (accepted) . . . . .	1,159	10	0

HAVERHILL.

For Erection of New Corn Exchange, Haverhill, Suffolk, for the Board of Directors. Mr. F. WHITMORE, Architect, Chelmsford.

Everett & Son, Colchester . . . . .	£1,473	0	0
C. E. Orfeur, Colchester . . . . .	1,398	0	0
Grimwood & Son, Sudbury . . . . .	1,395	0	0
Mason & Son, Haverhill . . . . .	1,329	0	0
F. Dupont, Colchester . . . . .	1,275	0	0
A. DISS, Colchester (accepted) . . . . .	1,250	0	0

HIGHWORTH.

For New Shop Front, &c., High Street, Highworth, for Mr. G. Yeates. Mr. WILLIAM DREW, M.S.A., Architect, 22 Victoria Street, Swindon.

J. THOMAS, Highworth (accepted).

HURST.

For Erection of a Dwelling-house, Turner Lane, Hurst, for Mr. S. Sidebottom. Mr. J. H. BURTON, Architect, Ashton-under-Lyne.

W. Clough, Ashton-under-Lyne . . . . .	£445	0	0
J. Whatmough, Hurst . . . . .	444	10	0
J. W. Williamson, Ashton-under-Lyne . . . . .	438	0	0
J. Gibson, Dukinfield . . . . .	416	0	0
W. Tickle, Dukinfield . . . . .	414	10	0
Fitton & Bowness, Ashton-under-Lyne . . . . .	414	0	0
J. Garside, Ashton-under-Lyne . . . . .	411	0	0
C. Morris, Ashton-under-Lyne . . . . .	399	0	0
T. Dean, Ashton-under-Lyne . . . . .	385	0	0
A. Holmes, Ashton-under-Lyne . . . . .	385	0	0
J. ROBINSON, Ashton-under-Lyne (accepted) . . . . .	385	0	0

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For Forming Road through Ballast Hill, at East Side of No. 2 Quay, to the River Tyne. Mr. J. PETREE, Borough Surveyor, Jarrow.

Jackson, Jarrow . . . . .	£448	0	0
W. Kennedy, Jarrow . . . . .	443	0	0
G. Maughan, Jarrow . . . . .	400	0	0
J. Scott, Jarrow . . . . .	319	10	0
Surveyor's estimate . . . . .	220	2	0

LONDON.

For Repairs, &c., to Town Hall, Old Street, for the Vestry of St. Leonard, Shoreditch.

Highest . . . . .	£1,331	9	6
W. Dudley, New Southgate (lowest) . . . . .	493	9	0

Sixteen tenders were received.

For Repairs to No. 8 Geneva Road, Brixton, for the Directors of the London Commercial Deposit Building Society, 15 Lamb's Conduit Street, W.C. Mr. W. F. POTTER, Architect.

Bassano, Red Lion Square . . . . .	£44	18	0
F. Dawes, Peckham Rye . . . . .	34	0	0
McCulloch, London . . . . .	32	10	0
H. Duffill, Stamford Hill . . . . .	30	0	0
J. B. KING, New North Road (accepted) . . . . .	30	0	0

For Paving and Making Roadway, Wood Fencing, &c., adjoining Hammersmith Bridge. Mr. H. MAIR, Surveyor.

Turner & Sons, Chelsea . . . . .	£1,137	0	0
Nowell & Robson, Kensington . . . . .	860	0	0
Rogers & Co., Notting Hill . . . . .	793	0	0
Tomes & Wimpey, Hammersmith . . . . .	770	0	0
T. Coat, Hammersmith . . . . .	721	0	0
J. MEARS, Hammersmith (accepted) . . . . .	695	0	0
Surveyor's estimate . . . . .	729	0	0

For Supplying Wainscot Panelling and Doors in Dining-room at 52 Sloane Street, for Mr. Wilson Noble, M.P. Mr. J. A. STENHOUSE, Architect.

C. HINDLEY & SONS, Oxford Street (accepted) . £185 0 0

For Decorations to Staircase and Reception-rooms at No. 2 Mansfield Street, for Mr. Morris.

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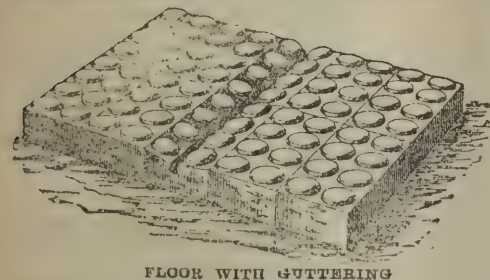
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For Alterations and Improvements to Dwelling-house and Farm Buildings, Bodigga Farm, near Looe, Cornwall. Mr. S. HOOPER, Architect, Hatherleigh.	
S. Dawe, West Looe . . . . .	£592 0 0
T. C. HICKS, Liskeard ( <i>accepted</i> ) . . . . .	549 0 0
Reeves & Whale, East Looe . . . . .	425 0 0
Architect's estimate . . . . .	555 0 0

## LYDFORD (DEVON).

For Roofing the Chancel of Lydford Church, and other Works. Mr. S. HOOPER, Architect, Hatherleigh.	
Blowey, Plymouth . . . . .	£162 0 0
Knight, Tavistock . . . . .	160 0 0
Northcott, Ashwater . . . . .	158 10 0
Huggins, Lydford . . . . .	135 0 0
Wiffen, Holsworthy . . . . .	130 0 0
W. PETHERICK, Hatherleigh ( <i>accepted</i> ) . . . . .	116 0 0
Architect's estimate . . . . .	125 0 0

## MAIDSTONE.

For Building Boiler-house at Charles Museum, Maidstone. Mr. F. J. C. MAY, Borough Surveyor.	
A. N. Pryer & Co., Maidstone . . . . .	£118 0 0
W. C. Holloway, Maidstone . . . . .	117 17 0
H. J. Smith, Maidstone . . . . .	112 9 0
G. CHANDLER, Maidstone ( <i>accepted</i> ) . . . . .	107 0 0

## MEMBURY.

For Erection of a Teacher's House with Outbuildings, at Membury, near Chard, Somerset, for the Membury School Board. Messrs. PINNEY, SON & FARMER, Architects and Surveyors, Axminster. Quantities by Mr. H. E. Farmer.	
H. Parker, Seaton . . . . .	£430 0 0
Turner & Skinner, Honiton . . . . .	425 0 0
W. T. Berry, Honiton . . . . .	410 0 0
Parsons and Perryman, Axminster . . . . .	406 12 0
Francis Hill, Chard . . . . .	385 0 0

## PITSEA.

For Erection of the Bull Inn, Pitsea, Essex, for Messrs. Crabb, Veley & Co., Great Baddow. Mr. F. WHITMORE, Architect, Chelmsford.	
A. DISS, Colchester ( <i>accepted</i> ) . . . . .	£620 0 0

## NEWMARKET.

For Building Infectious Hospital, Cottage, Boundary Walls, &c., Exning, Newmarket, for the Newmarket Union Rural Sanitary Authority. Mr. PERCY HOLLAND, Architect.	
Henry Turner, Cambridge . . . . .	£2,506 0 0
Hugh Cave, Thorney . . . . .	2,045 12 0
Redding & Son, Cambridge . . . . .	1,950 0 0
Blyth & Hunt, Newmarket . . . . .	1,917 2 6
Mark Kent & H. Holland, Newmarket . . . . .	1,916 0 0
Richard Atber, Newmarket . . . . .	1,864 0 0
Plummer & Hook, Rattlesden . . . . .	1,788 0 0
Harry D. Linzell, Newmarket . . . . .	1,694 0 0
H. C. Coulson, Cambridge . . . . .	1,665 0 0
P. Banyard, Cambridge . . . . .	1,602 10 0
Cowell & Son, Soham . . . . .	1,552 0 0
CHARLES KIDMAN, Cambridge ( <i>accepted</i> ) . . . . .	1,428 0 6

## PORTADOWN.

For Building Teacher's Residence, for the First Presbyterian Church, Portadown.	
R. Lutton, Portadown . . . . .	£480 0 0
BRIGHT BROS., Portadown ( <i>accepted</i> ) . . . . .	468 0 0

## SEAFORD.

For Building the County of Surrey Convalescent Home on the Blatchington Estate, Seaford. Mr. EWAN CHRISTIAN, Architect.	
Dart . . . . .	£12,225 0 0
Roberts . . . . .	11,910 0 0
Card . . . . .	11,758 0 0
Nightingale . . . . .	11,757 0 0
Dove Bros. . . . .	11,375 0 0
Peerless . . . . .	11,286 0 0
Norman . . . . .	11,284 9 0
Perimeter . . . . .	11,231 2 6
Adcock . . . . .	10,986 3 9
Goddard . . . . .	10,946 0 0
Charterers . . . . .	10,869 0 0
SHILLITOE, Bury St. Edmunds ( <i>accepted</i> ) . . . . .	10,215 0 0

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For Building Town Hall, Sutton-in-Ashfield. Mr. J. P. ADLINGTON, Architect, Sutton-in-Ashfield. Quantities by Architect.	
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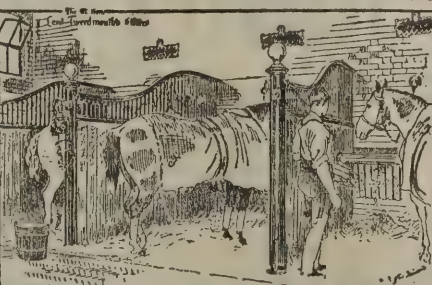
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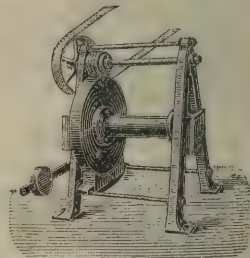
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For the Westoe Road Board Schools, South Shields. Mr. J. H. MORTON, F.R.I.B.A., Architect, South Shields.

R. Goodwin & Son, South Shields	£16,984	0	0
Middlemiss Bros., Newcastle	16,472	0	0
James Young, Tyne Dock	15,585	0	0
Wm. Scott, South Shields	15,581	0	0
John Vintin, South Shields	15,485	0	0
James Douglass, Cullercoats	15,312	0	0
R. Summerbell, Tyne Dock	15,267	0	0
D. & J. Ranken, Sunderland	15,235	0	0
Thos. Fortune, North Sunderland	15,212	0	0
Peter Marshall, South Shields	15,136	0	0
J. B. Weir, South Shields	14,949	0	0
J. & W. Lowry, Newcastle	14,709	0	0
D. Lawes & Co., South Shields	14,595	0	0
Thos. Lumsden, Jarrow	14,459	0	0
Kilburn Bros., South Shields	14,247	0	0
W. Scott & Son, Sunderland	13,980	0	0
E. Anderson, South Shields	13,846	0	0
Jos. Elliott, North Shields	13,840	0	0
ROBT. ALLISON, Whitburn (accepted)	12,994	0	0
Thos. Pigg, South Shields	11,710	0	0

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For Works in connection with the Water Supply, Stony Stratford, including Engine-house, Gas-engines and Pumps, Water-tower, and Mains, &c. Mr. A. F. PHILLIPS, Engineer, 31 Great George Street, Westminster.

Easton & Anderson, London	£4,000	0	0
Currell & Lewis, Birmingham	3,439	0	0
T. Heath, Towcester	3,390	0	0
A. Dodman, King's Lynn	3,293	0	0
H. Hill, High Wycombe	3,289	0	0
T. Small & Sons, Birmingham	3,198	0	0
H. Mobbs & Co., Northampton	3,175	0	0
H. J. Rogers, Watford	3,075	0	0
J. T. Wingrove, Northampton	3,021	0	0
A. J. GOULD, Southampton (accepted)	2,990	0	0

**SWINDON.**

For Pulling Down No. 24 Wood Street, Swindon, and Erecting new Business Premises. Mr. WILLIAM DREW, Architect, Swindon.

J. WILLIAMS, Swindon (accepted).

**WOKING.**

For Alterations and Additions to Firlands, Woking, for Mr. E. Prier. Mr. E. P. LOFTUS BROCK, F.S.A., Architect.

John Till	£1,256	13	0
Mattock Bros.	1,240	0	0
Joseph Whitburn	1,180	10	0
George Shears	1,120	0	0
Henry Ingram	1,080	0	0
Howe & White	1,080	0	0
P. Peters	1,025	0	0
A. J. Batchelor	970	0	0

**YARMOUTH.**

For Building Warehouse in Row 85 for Mr. F. Marsh, Great Yarmouth. Messrs. HEWITT & BANHAM, Architects, Great Yarmouth.

T. G. Leggett, Gorleston	£261	0	0
R. Eastoe, Great Yarmouth	260	16	0
Grimble & Watts, Great Yarmouth	260	0	0
J. F. W. Bray, Great Yarmouth	258	0	0
W. H. Moore, Great Yarmouth	256	0	0
J. P. Knights, Great Yarmouth	255	0	0
M. Barnard, Gorleston	251	0	0
G. H. Springall, Great Yarmouth	240	0	0
R. Kemp, Gorleston	199	0	0
A. E. BOND, Great Yarmouth (accepted)	195	0	0

**TRADE NOTES.**

THE Edinburgh Water Trustees have instructed the Works Committee to report on the various available sources of water-supply. Suggestions have been made to revive the St. Mary's Loch scheme.

A HANDSOME pulpit of marble and Caen stone, the work of Mr. Benjamin Taylor, of Leeds, has been presented to the restored parish church at Pudsey by Mrs. Scales, of Armley.

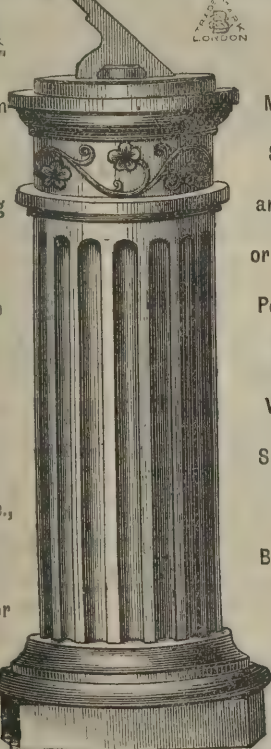
SANCTION has been given by the Local Government Board for a loan of 2,300*l.* for the construction of public baths at Guildford.

A PUBLIC meeting was held on Monday evening in the Hackney Town Hall, to promote the establishment of a Technical and Recreative Institute for the borough.

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IN reference to the article on the rain-water separator in *The Architect* of last week, Mr. C. J. Roberts writes to us asking us to draw attention to the advantages of the new form of "Horizontal Separator," illustrated and described in that article. The rain-water separator is well known, and in case these material improvements may be overlooked, it may be briefly stated that the special advantage of the new form of separator is that it occupies much less vertical space than the previous forms. Thus for roofs of 1,801 to 2,800 square feet area the inlet had to be 26 inches above the outlet pipe for pure water, while with the new separator it need be only 6½ inches above it. A space of 6½ inches between the rain-water pipe and the overflow-pipe of the tank can generally be obtained without difficulty.

THE latest scheme for testing drains is related of a man in Chicago, who, having reason to suspect that the house drains were defective, threw the entire establishment open to the inspection of his cat, and then poured a strong infusion of valerian into the pipes, with the result that the leaks were soon discovered by the animal.

THE Parish Offices, Dudley, are warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester and London.

MESSRS. HAYWARD TYLER & CO., of 84 Whitecross Street, London, E.C., now undertake the complete fitting up of private houses, public buildings, factories, &c., with the electric light. The department is under the charge of Mr. C. P. Hammond, an experienced electrician, and they will be glad to receive inquiries from architects requiring such work done.

AT the meeting of the Glasgow School Board on Monday it was reported that a site had been purchased for a new school in Napiershall Street, and also that it had been decided to erect science, drawing, and cookery-rooms in connection with John Street School.

IN his annual report Dr. J. B. Russell, the medical officer of health, Glasgow, writes:—"I have just received from Mr. Henry, the city assessor, the return of inhabited houses within the municipality, as at June 1 last, from which I annually make my estimate of the population. The number of occupied houses was 114,863, which, multiplied by 4.745 (the average number of inhabitants per house in 1881), gives 545,025 persons. Adding to this 6,410, the number of inmates in institutions, as ascertained by special census, I find that the total population of Glasgow, as estimated from the occupied houses, on June 1,

1888, was 551,435. This, as compared with last year, shows an increase in houses of 1,515, and in population of 7,440 souls. It would appear that, after increases alternating with decreases during the previous four years, last year the population increased at nearly 3½ times the rate of growth between 1871 and 1881."

A LARGE clock, striking hours, chiming the Westminster quarters, and showing time on two large dials, has just been erected at Willey Park, Shropshire, to the order of Lord Forester, by Messrs. John Smith & Sons, Midland Clock Works, Derby. It is fitted with all the latest improvements and is expected to go with extreme accuracy.

THE sub-committee of the York Corporation have visited Manchester to inspect the action of automatic and other sprinklers, and it is probable that in consequence of the satisfactory experiments they witnessed they will recommend the adoption of sprinklers in some form at York Theatre, which is now undergoing alterations, to provide for the safety of the public in case of fire or panic.

A GREAT improvement is reported of late in the imported timber trade. Prices of red and yellow pine, pitch pine, and spruce deals have practically doubled within a few months. This has been caused to some extent by the great increase in freights in shipping. Large stocks of timber are not held in this country, and this increase in price has brought about a corresponding increase in the values of those British timbers which are used for similar purposes, as red and yellow pine, pitch pine, and spruce deals. There is every prospect of this improvement being maintained for some months to come, and it is thought it will tend to check the importation of timber from foreign countries till the market gets to a more evenly balanced position.

AN ingenious and effective reversible window has been patented by Mr. James Millar, of Newcastle-on-Tyne. In view of the dangers and numerous fatal accidents caused through cleaning windows from the outside, every additional appliance that tends to safeguard life is welcome. There is a wide field open for such appliances in all buildings, more especially in such buildings as hotels, colleges, schools, asylums, &c., that have windows of high elevation. The chief points aimed at have been simplicity and minimum of cost, which latter does not exceed that of the windows now in use. It can also be applied to any form of window, and existing windows can be altered and adapted in a few hours at a small cost. The win-

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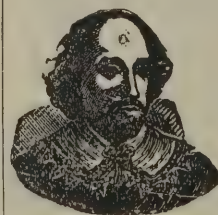
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dows are self-balanced, so that they can be opened to any distance for ventilation, and when closed are both air-tight and water-tight, and a person can clean, paint, glaze, or repair them standing in the inside of the room with absolute ease and safety.

THE brick trade at Oldbury is reported to be in a flourishing condition, and some of the manufacturers in the locality have secured some large orders. One firm has received an order which will keep their large works fully employed for over twelve months. There is also lately great activity in the iron trade, and some works which have been closed for a number of years are on the eve of being restarted; and it is stated that new industries will be shortly introduced into the town, prominent amongst which will be new rolling mills at the Aluminium Works.

THE members of the Association of Birmingham Students of the Institution of Civil Engineers on Friday made an inspection of the engines, machinery, and other works at the dépôt of the Hockley Cable Tramways. They also inspected the works now in progress in the extension of the system to New Inns, Handsworth. The party was conducted over the works by Mr. A. W. Pritchard, in the absence of the engineers.

At the meeting of the Dundee Town Council last week a proposal was made in favour of erecting a parapet wall and railing round the town's churches, and planting the grounds with trees and shrubs. On the other hand it was said that the first consideration ought to be to put the churches in proper repair, as the state of the masonry was a discredit to the town. It was remitted to the town architect to report as to the renovation of the masonry and the cost of erecting a parapet wall and railing round the churches. A committee was also appointed to consider as to the beautifying of the grounds.

THE Dean of Guild Court, Maryhill, Glasgow, on Friday sanctioned the erection of a new wing to the premises of Paterson's Chemical Manufactory Company, 150 feet in length by 64 feet in breadth.

ON Friday, at a meeting of the Smethwick Local Board, it was reported that the award of Mr. Till, the Birmingham borough surveyor, had been received with regard to the Handsworth and Smethwick joint-sewerage accounts, certifying that the total amount payable by Smethwick was 14,046*l.* 19*s.*, and to complete that amount Smethwick had yet to pay 1,545*l.*, and in addition 75*l.* for charges. These terms were considered to be favourable to Smethwick.

THE ceremony of cutting the first sod of the Belfast Main Drainage Works has been performed at Thompson's Bank, Duncrue Street, by Mr. William M'Cammond, J.P., chairman of the Town Improvement Committee. The cost of the works is estimated at 300,000*l.*

THE contract has been, it is stated, obtained by Mr. Walter Scott, contractor, Newcastle-on-Tyne, for the extensive works in connection with the rebuilding and rearrangement of the Central Station, for the directors of the North-Eastern Railway.

ON Saturday a memorial marble credence-table, piscina, and aumbrey, which have been erected on the south wall of the sanctuary of St. Paul's Episcopal Church, Dundee, executed by Messrs. Farmer & Brindley, London, were dedicated.

EXTENSIONS to Leeds Infirmary are contemplated, and 30,000*l.* will be required to carry out the work. Colonel North has given 5,000*l.*, and other sums are promised towards the building fund.

AT Olanteigh Towers have been erected a series of three new picture galleries, which will rank amongst the finest in this country, the architect being Mr. Grant, of Sittingbourne; and special attention has been paid to the ventilation, which is effected on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air, fresh air being admitted by Boyle's improved air inlets.

THE Paris correspondent of the *Daily News* says that, on Tuesday afternoon, 110 out of the 114 rivetting workmen engaged in adjusting the iron girders and plates of the Eiffel Tower decided not to return to their work, and mean not to resume it until they obtain an addition to their wages of two-pence an hour. The reason they give is that the higher the tower grows the greater the risk becomes of working on it. It is now over 475 feet in height. M. Eiffel offered them a halfpenny an hour more, but this was refused. The average wage is 5*s.* 11*d.* per day of eleven hours.

THE annual report of Mr. James Lovegrove on the works executed during his thirty-second year of office, as chief surveyor to the Board of Works for the Hackney district, gives an exhaustive account, in lucid and concise form, of the works carried out, and the working expenses, including such matters as lighting, watering, painting, &c., materials, and labour. It appears that the extension of streets, sewers, and houses has continued to so great an extent that there are now 99 miles in length of roads and streets under the care of the Board as

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against 31 miles in 1856, and the total cost of the works executed by the Board during the year under the department has been about 53,000*l*. During the year notices have been received of intention to erect 320 additional houses, besides other buildings; also to form 1½ mile of new streets, and to construct 3,739 lineal feet of new sewers.

#### NEW CATALOGUE.

A TASTEFUL little price-list, under the title of "Hildesheimer & Faulkner's New Publications for the Season 1888-89," has been forwarded to us. The aim in preparing the new publications has been throughout to render them not only artistic but popular. In Christmas cards, books, and booklets, photographic opals, &c., the old lines have in a great measure been departed from, and Messrs. Hildesheimer put them forward for the market with every confidence as both good and novel for the Christmas season. For these and New Year cards two sample books are issued. In the first, book-shaped cards are a prominent feature of novel and graceful forms. The second includes the Cameo and Wedgwood series, harmonies in embossed bronzes, diamond and pearl embossed cards, and private and autograph folding cards in fancy forms.

#### PURIFICATION OF THE THAMES.

IN the recently-published report, the Metropolitan Board of Works give an account of their stewardship anent the disposal of London sewage. The Royal Commissioners, the report states, were of opinion that the only effectual way of attaining complete immunity from smell, after precipitation of the solid matter, was to further purify the liquid by a process of filtration through earth, and they advised that such a process of filtration should be adopted if it were decided to discharge the sewage effluent into the Thames in the neighbourhood of the present outfalls. The acquisition of sufficient land, however, in the neighbourhood of Barking and Crossness to enable the vast quantity of London sewage to be effectively filtered through the soil, was found upon examination to be attended with such great difficulty, to say nothing of cost, that the Board conceived it to be its duty to endeavour, under competent advice, to find some other method sufficiently effective to obviate the necessity of earth filtration.

What was required seemed to be an oxidising agent which would not only effect the immediate destruction of any offensive odour still remaining after chemical precipitation, but which would at the same time prevent the development of noxious gases. It was found that permanganic acid was effectual in accomplishing both these objects. The Board was extremely anxious that there should be no mistake in the conclusion arrived at upon this important point, as upon it would mainly depend the determination of the course to be taken. The Board accordingly again sought the opinion of the four eminent chemists who had advised upon the method of precipitation. They all, after careful observation of the experiments made, gave it as their opinion that if the liquid resulting from precipitation with lime and proto-sulphate of iron were subsequently treated with manganate of soda and sulphuric acid, it would be deodorised and purified to such an extent as to render its discharge into the river unobjectionable at all states of the tide.

With this authoritative opinion before it the Board felt that the filtration difficulty might be regarded as overcome, and that it might safely be concluded that the adoption of the process of precipitation, with the further resort to permanganic acid in hot weather, as proposed, would effectually render the discharge of the sewage into the river innocuous and inoffensive all through the year. This conclusion arrived at, the Board proceeded at once to act upon it, and ordered plans to be got ready for the works necessary to enable the process to be brought into operation. The plans for the works at Barking, the site of the outfall on the north side of the Thames, were first prepared; and in January 1887, a tender was accepted for the execution of the works for the sum of 406,000*l*. The plans for the permanent works at the Crossness outfall, on the south side of the river, are in a forward state of preparation. While the permanent works at Barking have been in progress, the experimental operations at Crossness have continued to be carried on. The total quantity of sewage treated during the year just ended has been a little over 2,000,000 gallons. The wet sludge obtained therefrom amounted to 62,000 tons, which on further settlement in the subsiding tanks, was reduced to 41,000 tons. Of this quantity 39,556 tons was pressed into 14,401 tons of sewage sludge cake, the remaining 1,444 tons being treated for experiments in various ways. About 10,985 tons of the cake has been delivered into trucks at the Abbey Wood Station of the South-Eastern Railway, or into vessels alongside the Board's wharf at Crossness,

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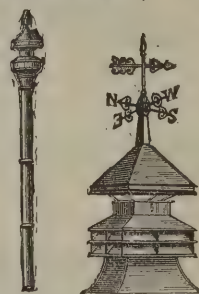
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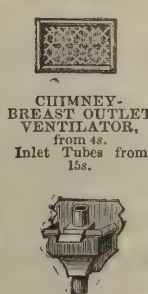
The "IMPERIAL" CLOSET, 15s. 6d. 3-gal. Cast-Iron Tank and Fall Pipe, 25s. 6d. White Glaze from 7s. 6d.



The "INTERCEPTOR" SELF-CLEANSING TRAP, 10s. 6d. and 15s.



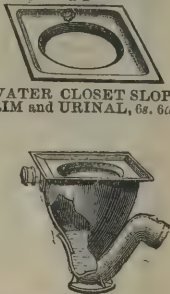
The "IMPERIAL" EXHAUST VENTILATORS for Roofs and Soil Pipes, and Chimney Cowl, from 12s. 6d.



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The "COMBINATION" CLOSET, 15s. and 20s.

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N.B.—The Interceptors and all other Traps are absolutely self-cleansing, and dispense with grease collectors. Illustrated List, also "Instruction in Sanitary Construction" (Domestic Section, abbreviated), and "Memorandum on House Sanitation and the Law of Landlord and Tenant thereon," by R. Weaver, C.E., F.C.S., Sanitary Surveyor, free by post.

The Domestic Engineering and Sanitary Appliances Company, 24 High Holborn, London, W.C.



free of charge to farmers and others who have applied for it for experimental use in agriculture.

As regards the permanent method of disposing of the sludge, it may be mentioned that the Royal Commission suggested that it could be applied to the raising of low-lying lands, or burned, or dug into land, or carried away to sea. The Board having considered with care these various suggestions, came to the conclusion that the only practicable course, in the case of the metropolis, was to carry the material away and cast it into the sea, unless it should fortunately turn out that the sludge could be applied with advantage for agricultural purposes. As, however, the Board felt that, even in the most favourable circumstances, considerable time must elapse before the merits of the sewage-sludge as a manure could be so widely recognised that farmers would be found ready to take the whole of the supply off the Board's hands, and as it was necessary to provide for its removal at once, the Board gave directions for a vessel to be specially constructed for the purpose of carrying the sludge out to sea and there discharging it. The vessel was built by the Barrow Shipbuilding Company at a cost, including fittings, of 16,952*l.* 10*s.* It was launched from the company's yard at Barrow-in-Furness on May 25 last, and arrived in the Thames, off Erith, on June 29 following. The vessel will carry the sludge at such a level that it will have a sufficient head of discharge when the vessel is loaded, the head being maintained by the rising of the lightened vessel as the sludge flows out.

During the long-continued hot and dry weather of the past summer it was found necessary (as in the previous year) to deodorise the sewage at the two main outfalls, before allowing it to pass into the river. The Board, thinking it desirable to obtain the opinion of some leading chemist who had not previously been consulted on the subject, had recourse to Sir Henry Roscoe, and under his advice chloride of lime and, subsequently, manganate of soda with sulphuric acid, were used at the outfalls. In the years 1885 and 1886 the Board had, with a view to checking the development in the sewers themselves of the injurious compounds which are generally known as sewer-gas, introduced during the summer months deodorising materials into the sewers at the intermediate pumping stations at Pimlico, Deptford, Battersea, and Vauxhall, and at other places in different parts of London. The cost of thus treating the sewage in the sewers was very large, and the question was raised whether the results were worth the expenditure, and whether equally good results could not be obtained by some

less expensive method. Upon this point also Sir Henry Roscoe was consulted, and, under his advice, the Board discontinued putting manganate of soda and sulphuric acid into the sewers, and reverted to a process which had been tried in the years 1870 and 1871, and had since fallen into disuse, the process being to neutralise the offensive gases, as they rose through the ventilating shafts, by an application of sulphurous acid. The Board accordingly, early in July last, gave directions that, whenever complaints were received of offensive odours being emitted from any of the ventilating shafts of the sewers under the Board's control, sulphurous acid should be applied. Under these instructions 146 ventilators to the sewers on the north side and forty-eight to those on the south side of the river Thames were so dealt with, at a cost of about 600*l.*

#### STATISTICS OF VISION AND COLOUR SIGHT.

AMONG the papers submitted at the meeting of the British Association was one by Mr. G. W. Bloxam relating to observations made by himself and Dr. J. G. Garson. It appeared that observations as to the colour of the eyes were taken of 200 people, 102 men and 98 women, but it had been impossible to classify them. As to the keenness of eyesight, the average who attended for the purpose was—in men, the right eye could see diamond type at a distance of 19·6 inches, and the left at a distance of 18·2 inches. There was a distinct difference between the right and left, and also a similar difference among women, who with the right eye saw at a distance of 19·2 inches, and with the left 18·7. The age of the men examined averaged 41·7 years, whereas that of the women was between 23 and 25. In no case could any man see more than 34 inches with the right eye, but with the left, curiously enough, one could see beyond that distance. The right eye was equal to the left eye in 26 instances in the men and in 31 in the women; in 35 cases among the men and in 28 cases among the women the right eye could see further than the left, and in 24 cases in the men and 28 cases in the women the right eye was worse than the left. Only one case of absolute colour-blindness was found among the 200 individuals; that was in the case of a Jew, and was rather less than might be expected. In the general population of Great Britain 4·16 per cent. were colour-blind, but among the professional classes the percentage was only 2½ per cent., while among the Jews colour-blindness was rather more frequent—4·9 per cent.

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## THE MANCHESTER SHIP CANAL.

THE valley of the Irwell, from Salford to Cadishead, the *Manchester Guardian* says, now presents one continuous scene of activity. At Partington, on the Cheshire side of the river, a large cutting is being made to divert the Mersey into the Irwell at a point opposite Irlam known as Sandywarp. This will afford the contractor another "great tip." On this section there are four locomotives at work. A ballast line has been constructed from Irlam station on the Cheshire lines to Flixton, where a number of workmen's dwellings have been erected. Here there are five locomotives, and on both sections there are engine-sheds, offices, and hospitals for disabled workmen. A portion of the engine-sheds at Skeer Rock, Cadishead, have been removed to Partington, and the pay offices have been converted into workmen's dwellings. The locomotives stationed here, seven in number, run as far as Latchford, Cheshire, a track bridge having been constructed across the Irwell at Rixton. A portion of the Irwell has been filled up near Stickins Island, and where the locks will be situated the depth of the canal has been reached. On the southern side of the river at Barton piles are being driven into the water, so as to form a track railway, which will run under the southern arches of the aqueduct and Barton Bridge, by which the ballast lines in the meadows east and west of Barton locks will be connected. At various points in the river track bridges are being constructed, so that through communication by rail may be established between Salford and Eastham.

## PUBLIC WORKS IN LONDON.

THE report of the Metropolitan Board of Works states that two additional improvement schemes under the Artisans and Labourers' Dwellings Improvement Act, 1875, were approved by Parliament last year—244 blocks of buildings have now been erected by the Board under the Act, and dwelling accommodation has been provided in them for about 26,000 persons. Apparently this work proceeds very slowly. It appears that the bridges acquired by the Board under the Act of 1877, and which are now maintained free, have cost a million and a half sterling. These are Waterloo, Lambeth, Vauxhall, Chelsea, Albert, Battersea, Wandsworth, Putney, Deptford Creek, Hammersmith, and Westminster. The London, Southwark,

and Blackfriars Bridges are under the control of the City Corporation. The ground at Hammersmith, known as Ravenscourt Park, is the only actual addition to the public pleasure grounds of London during the twelve months. But Victoria, Battersea, and Kennington Parks have been transferred to the Board, and also Wandsworth Common. The total area of parks, gardens, and open spaces under the Board's control is now 2,603½ acres. To this the chief contributors are Blackheath (267 acres), Victoria Park (244 acres), Hampstead Heath (240 acres), and Battersea Park (198 acres). Ravenscourt Park cost 58,000/. Once more assurance is given that precautions against floods are well-nigh completed. New large sewers intended to supplement some of the sewers of the main drainage system, which were found inadequate to carry off with sufficient rapidity the enormous quantity of water which found its way into them at times of heavy rain, have been constructed. Four miles of new sewers have been made in the neighbourhood of Hackney Road at a cost of 78,500/. The small new pumping station in the Isle of Dogs is calculated to cost over 21,000/. Nearly a thousand wharf-owners on the river have complied with the directions of the Board to raise the banks so as to prevent the overflow of the Thames. In the report concerning fire and fire-brigades, it is stated that the funds are still insufficient to supply all the wants of the Metropolis, "so that any enlargement or strengthening of the brigade is at present out of the question." Fifty-five lives were lost last year by fire, and 198 lives were seriously endangered. The number of calls was 3,059, the serious fires amounting to about 7 per cent.

## TECHNICAL EDUCATION FOR ENGINEERS.

A SPECIAL committee of the Manchester Association of Engineers have prepared a course of study for youths engaged in engineering workshops, with a view to enable them to become efficient workmen, and to prepare them, when their practical experience is matured, to hold good positions in the various departments of engineering. A course of reading by steady work in evening classes is indicated, and for the purpose of systematic study—in which progress can from time to time be tested by a graduated course of examinations—and also to enable students to take advantage of the very favourable terms offered by the Government, the syllabus has been arranged on the basis of that of the Science and Art Department. Another reason why the classes in connection with the Science and Art

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## RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIRS.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 32 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIRS.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly, S. C. LOWE & SON.

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Department are recommended is that upon the result of those examinations the Whitworth scholarships for mechanical science are awarded. The subjects recommended to be taken up include freehand drawing, practical plane and solid geometry, mechanical drawing, mathematics, theoretical and applied mechanics, sound, light and heat, magnetism and electricity, chemistry, metallurgy, &c. Upon all these subjects valuable hints are given in the syllabus, together with the titles and authors of standard works in relation thereto.

#### THE COX-WALKER-SWINTON MAGNETO-BELL SYSTEM.

ELECTRIC bells and signals have hitherto depended largely for their action on voltaic batteries, and these are notably difficult to maintain in working order, but are always consuming, and therefore constantly incurring, expenditure for replenishment. It is well known what a frequent source of trouble is the ordinary electric-bell battery. It cannot be sent out charged and ready for use, but this must be effected after it reaches its destination. In hot weather it is apt to dry up and refuse to work; in cold weather it freezes with the same result. After a few months' working it must be recharged, and after a year or two it is worn out, and must be renewed entirely. These operations generally require skilled attendance, often difficult to obtain, and thus cause great expense and annoyance. The new magneto-bell system of Mr. E. Cox-Walker and Mr. A. A. Campbell Swinton has been designed to obviate these disadvantages. The electric currents that operate these instruments are generated when required by the motion of a coil of insulated wire between the poles of a permanent magnet. No battery or anything else that consumes away and requires replenishing, or is likely to get out of order, is employed, and the apparatus is thus practically everlasting. The magneto-generator, which takes the place of the push-button and battery used with ordinary electric bells, consists of a single horseshoe permanent magnet made of steel, fitted with soft iron pole-pieces, between which is pivoted an armature composed of a shuttle-shaped soft iron core wound over with insulated copper wire. In connection with this armature is a small brass handle, by means of which the armature is easily turned backwards and forwards through a small arc. There is no gearing or other complications, and the parts mentioned, together with a pair of brass terminal screws in connection with the two ends

of the wire on the armature, and serving for the attachment of the double wire leading to the bell, comprise the whole transmitting apparatus. The generator is simply operated by taking the small handle between the finger and thumb and giving it a rapid to-and-fro motion. This movement generates electric currents in the armature wire by electro-magnetic induction, and these currents pass away through the terminals and double connecting wire to the bell at the other end. Several types of bell are manufactured to suit different requirements. In each there is an electro-magnet, in front of the poles of which is pivoted an armature carrying a hammer, the core of the electro-magnet and armature being kept continually magnetised by means of a small permanent magnet. When the generator is operated the electric currents pass round the wire on the electro-magnets, and, being of varying strength and direction, cause the armature and hammer to vibrate. In some cases two gongs are employed with the head of the hammer placed between them, so that each gong is struck alternately. This produces a pleasant musical effect; but where greater simplicity and compactness are required only one gong is used, this gong having two projecting tongues cast on its rim, and the hammer head being arranged to strike first one tongue and then the other as it vibrates from side to side. They are being introduced by the Equitable Telephone Association, Limited, Queen Victoria Street, E.C.

#### MANCHESTER DRAINAGE SCHEME.

ON Tuesday the manager of the Coventry Sewage Works, established in 1878, Mr. E. F. Coddington, gave evidence before Mr. S. J. Smith, C.E., under the inquiry held as to the application of the Manchester Corporation to borrow 490,000*l.* for the proposed sewage scheme.

Mr. Coddington said he had been manager since the works were opened. He produced plans of the works, filter beds, and of the adjoining district. The sewage was drained through a screen, which took out all the faecal and other floating matter. It then passed through a chamber where it received the sulphate of alumina. In another chamber it received the sulphate of lime. The precipitating tanks next came into use, and then the effluent was passed on to the filter beds and thence into the rivers. The filter beds were eight acres in extent. Four million gallons of sewage could be daily chemi-

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WILLIAM WHITELEY, Westbourne Grove, London: October 12, 1887.

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GENTLEMEN,—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting powers of your Strong-room Doors and the Safes.

The recent fire at my establishment, in my opinion, subjected them to the greatest possible test, and through all they proved invulnerable. The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.

You will be pleased to hear that it has been decided to adopt your Patent Clutch Rebated Doors for all the party walls in the new buildings now in course of erection.—I am, Gentlemen, faithfully yours,

(Signed) **WILLIAM WHITELEY.**



cally treated and filtered. All over that quantity passed direct into the rivers. The tanks were cleared once in four days. Coventry sewage was very foul and very full of dye. There were also breweries and varnish works in addition to what might be called ordinary sewage. He had had no complaints from the surrounding inhabitants, and the health of the district, so far as he knew, was very good. In 1884 Coventry was threatened by the Corporation of Warwick with an injunction, on the ground that the effluent was not so clear as it ought to be, whereupon the Town Council of Coventry had the matter thoroughly investigated by Professor Tidy, who reported that there was no nuisance whatever, and that the Warwick people had nothing to complain of. Coventry heard nothing more of the matter. Professor Tidy, in making his report, went right through the works and down the river to Warwick, a distance of fourteen miles. He had never had any complaint from Coventry except once, when experiments were made in the growing of watercresses, when certain alterations in the filter beds were desired by the man to whom they were let. The pipes were stopped for three or four days to allow the water to stop on the beds, and the nuisance became intolerable and had to be put a stop to. No further complaint was ever made. The works were devoid of smell, and it was not unpleasant to walk about in them. Coventry was almost entirely a water-closet town. He could not give particulars of the drainage of the outlying districts. A small stream ran through the town, which was comparatively clear, and had a flow of 2,000,000 gallons per twenty-four hours. They had no difficulty in getting rid of their refuse. The farmers took it readily. The system of using lime and alumina in the treatment of sewage was spreading, and was being adopted by other towns. He considered that in providing for double the population they had not made too great provision. Before the farmers were quite satisfied as to the value of the manure made at the works they had a fairly large accumulation of it, he dared say as much as 1,500 tons. There was no nuisance in the removal of the manure. They considered the complaint of the Warwick people serious, but the City Council of Coventry satisfied themselves by the report of Dr. Tidy that they were in no way to blame in the matter. Nothing further was heard from Warwick. That was not in consequence of their paying a little more attention to the sewage after that time. They made no alteration in the treatment, but they made some alteration in the tanks. He considered eight acres amply sufficient for filtration purposes.

## CHURCH DECORATION.

THE chancel of the church of St. Charles Borromeo, at Weybridge, has just been finished with rich decoration and figures in the Italian Gothic style. The east wall is ornamented with angels painted upon a gold ground, each figure having a thurible and censuring towards the tabernacle. The centre of the upper part of the wall has a large circle of cherubs. Within a nebulae border on either side is the sun and moon, with stars, in gold on a light blue ground. The side walls are painted and diapered, the lower part being finished a low tone of light red, with the diaper in darker tint, with the monogram of St. Charles Borromeo in gold. The principal mouldings and parts of the carved work of the large stone canopy over the altar have been gilded. "Altare Privilegium pro Defunctis" is the inscription over the tabernacle. The lady chapel has also been elaborately decorated in blue, white, and gold. A conspicuous feature are large standards of lilies painted *à la naturelle*. Messrs. Pitman & Son, of Newgate Street, London, have designed and executed the work.

## ARTISANS' DWELLINGS IN GLASGOW.

AT the meeting of the Glasgow Town Council last week it was reported that the special sub-committee on the Saltmarket tenements had submitted to the general committee the following memorandum, prepared by Mr. Carrick, as to the property recently erected by the City Improvement Trustees on the east side of Saltmarket:—The property being now completely finished and fully let, the following details are submitted for the information of the trustees:—The property consists of five tenements, four storeys in height; four fronting Saltmarket and one having its entire elevation towards Steel Street. The street floor fronting Saltmarket is occupied as single and double shops, the three upper floors being constructed for dwelling-houses of one and two apartments suitable for the artisan class of the population. In the whole property there are 12 shops and 48 houses. The cost of the undertaking was originally estimated at 9,000*l.*, with a prospective rental of 1,100*l.* The plans on which this estimate was based were, however, considerably modified by the committee, who directed various amendments to be made, giving increased sanitary advantages and limiting the rental. The actual cost of the buildings is reported by the

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measurer as 9,723l. 13s. 9d., the reasons for the increased amount being found principally in the extra masonwork done under the instructions of the committee. The gross rental, amounting to 895l., has been easily obtained, and, so far as I can judge, will, in all likelihood, be improved, as there is every reasonable ground to expect that the value of the shops will increase. The extent of the site as presently enclosed is 1,500 square yards, and the present rental, after deducting 25 per cent. and allowing interest on the cost of the buildings at 3½ per cent., will leave a surplus sufficient to cover a ground rent of 4l. 14s. 4d. per square yard. The committee resolved to report the foregoing memorandum to the trustees for their information, and agreed to consider at next meeting the advisability of recommending the trustees to proceed with the erection of further buildings on the east side of the Saltmarket. The minutes also contained the following:—"There was submitted the abstract statement of the revenue and expenditure of the trust for the year May 31, 1887, to May 31, 1888, which had previously been circulated among the members of this committee. The committee having considered the same, approved thereof, and resolved to recommend the trustees to continue the assessment of 1d. per 1l. for the next year."

Mr. Dunlop referred to the various minutes submitted to the trustees. With regard to Mr. Carrick's report on the Saltmarket houses, he said the committee were not anxious to precipitate any question arising out of the report by asking for powers to finish this block of buildings. The committee chose rather to put before the trustees the financial facts as presented by Mr. Carrick, leaving them to say what course should be pursued in the future. It was very satisfactory to find that Mr. Carrick's estimates for building had only been exceeded by a few hundred pounds, and that was entirely occasioned by difficulties that had arisen and could not be foreseen in connection with the ground. He had received that morning from the factor of the trust a letter showing that the property was fully let, and that the rents due on August 1 were all promptly paid, many of them before they were due. Indeed, some of the tenants called at the factor's office and paid till November, without having been asked to do so. He had had several applications for shops and houses in the proposed additional tenements, and he had no doubt that if erected they would be readily let to good tenants. Mr. Dunlop went on to say there was one feature he should like to draw the attention, not merely of the council, but of the general public to, and it was this. When the plans were laid before the committee his lordship

very properly suggested that the accommodation should be somewhat typical of what the citizens required in such a place, and the single room, which was considered by many to be a thing that should be entirely obliterated, should be retained. It had been retained, and with such a successful result that it would be worth while for those parties who were agitating regarding this question to inspect those single rooms and see what comfort had been provided in them. The like of those one-apartment houses there was not in the kingdom. They had not merely a scullery, but all the privacy of a bedroom attached.

The minutes were confirmed.

#### REGISTRATION OF PLUMBERS.

A PRESENTATION of certificates took place in the Town Hall, Dundee, on Saturday afternoon. Mr. John J. Henderson, C.E., presided, accompanied by Mr. W. Farquharson, secretary to district council. The Chairman, after referring to the spread of the movement, said that probably no artisan holds the keys of disease in his grasp so completely as the plumber, who by good workmanship may exclude forces inimical to health, or by his incompetency may give entrance to malign influences that inflict suffering, and even death, upon their victims. He hoped the classes about to be started through the district council would gradually tend to establish a high order of proficiency in the craft. Eight certificates were then presented, which, along with those presented last week in Fife and Perth, make eighteen for this month.

The first meeting of the Liverpool district council was held last week, Mr. J. B. Smith, chairman of the Liverpool Health Committee, in the chair, and among the gentlemen on the platform were Dr. Stopford Taylor (medical officer of health of Liverpool), Dr. Sprakeling (medical officer of health of Bootle), and Dr. Carter (president of the Liverpool Medical Institution). There was a large attendance of representative master and operative plumbers. Messages of apology for non-attendance and promises of cordial support were received from the mayors of Liverpool, Bootle, and Birkenhead; Drs. Vacher and Steeves, medical officers for Birkenhead and Toxteth Park; the town clerk of Crewe, Mr. E. Jones (diocesan surveyor, Wrexham); Councillor Duncan, Mr. H. Duckworth (president of the School of Science); and the Preston Lodge of Operative Plumbers. It was decided, on the motion of Dr. Taylor,

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seconded by Mr. W. Merrick, that the council should be designated the "District Council for West Lancashire, Cheshire, and North Wales." The rules of the Plumbers' Company having been adopted, the following were appointed the registration committee:—Master plumbers: Messrs. G. Ewing, T. Holt, F. Bage, and S. R. Henshaw. Operative plumbers: Messrs. T. Anderson, J. Hoos, J. Duckers, and W. Scot. Public representatives: Dr. S. Taylor, Dr. Vacher, Dr. Sprakeling, and Mr. H. Duckworth. A board of examiners was appointed as follows:—(1) Master plumbers: Messrs. D. Lloyd, J. Powell, W. Male, W. Merrick, and A. C. Wilby. (2) Operative plumbers: Messrs. C. H. Milne, M. J. Heighley, J. Robinson, D. Levy, and D. Foulkes. Public representatives: Dr. Carter, Dr. Steeves, and Mr. E. Kirby, president of the Architectural Society. Mr. Watkin Hall, C.E., surveyor to the Great Crosby Local Board, was appointed secretary, and Councillor Duncan treasurer of the council.

#### ALEXANDRA PALACE.

THE thousands of delighted visitors to the Alexandra Palace during the present summer who have witnessed that striking production of Messrs. James Pain & Sons, "The Last Days of Pompeii," will be glad to learn that the Palace Company have given Messrs. Pain & Sons a benefit, which took place on Thursday, the 20th inst. Pompeii and Baldwin have been the only things worth seeing in this, as a usual rule, badly managed Palace. If the company could make their Palace a little attractive on other nights as well, there would be no reason why the Alexandra Palace should not rank among the popular London places of amusement, and instead of being, as now, fairly well filled only on occasions when fireworks or Professor Baldwin are the order of the entertainment, and then on other nights comparatively empty, visitors would be conspicuous by their presence rather than by their absence. The reputation of Mr. Pain and his sons has always been high, but it is considerably enhanced by Pompeii, which has unquestionably hit public taste. The island in the centre of the great lake was admirably suited to such a production, and the numerous boats rowing about the lake adds to the effect of the picture seen from the land. The programme issued for Thursday ran as follows:—"There will be a magnificent round of entertainments at the Palace for the amusement of the tens of thousands who will flock to it. The King of Cloudlands will make one of his

fearless ascents and leaps; all the specialties in the building will be in full swing. There will be two variety performances on the new stage of the central hall, the circus combination in the new arena will give two performances, Mr. J. Valentine Smith will give an English opera, probably "Maritana," in the theatre, and then will come off that marvellous production which will be the special object of interest of all who attend on this occasion. After the unequalled representation of Pompeii in its glory, and the incidents preceding its destruction, Vesuvius will be more terrible in its eruptions than ever; and after the city is destroyed there will be an unequalled display of fireworks, eclipsing all previous productions."

#### UTILISATION OF ELECTRICITY.

(Concluded.)

THE property which the electric current possesses of doing work upon the chemical constitution of bodies so as to break up certain liquid compounds into their constituent parts, and marshal these disunited molecules in regular order according to a definite law upon the surfaces of metals in contact with the liquid where the current enters and exists, has led to immense industries in electro-metallurgy and electro-plating. The extent of this industry may be gathered from the fact that there are 172 electro-platers in Sheffield and 99 in Birmingham. The term electro-metallurgy was originally applied to the electro-deposition of a thin layer of one metal on another; but this is now known as electro-plating. In 1839 Jacobi in St. Petersburg and Spencer in Liverpool laid the foundations of all we know of these interesting arts. Copper was deposited by them so as to obtain exact reproductions of coins, medals, and engraved plates. The first patents in this country and in France were taken out by Messrs. Elkington, of Birmingham, who still occupy the foremost position in the country. The fine metals, gold and silver, are deposited in thin layers on coarser metals, such as German silver, in immense quantities. Christofle, of Paris, deposits annually six tons of silver upon articles of use and of art, and if the surfaces so electro-plated were spread out continuously they would cover 140 acres. The whole of the copper plates used in Southampton for the production of our splendid Ordnance Survey maps are deposited by current on matrices taken from the original engraved plates, which are thus never injured or worn, are always ready for addition or

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correction, while the copies may be multiplied at pleasure and renewed at will. Nickel-plating, by which the readily oxidisable metals like iron are coated with a thin layer of the more durable material nickel, is becoming a great industry; the trappings of harness, the exposed parts of machinery, the fittings of cycles and carriages, and innumerable articles of daily use are being rendered not only more durable, but more beautiful. The electro-deposition of iron, as devised by Jacobi and Klein, in the hands of Professor Roberts-Austen, F.R.S., is giving very interesting results. The dies for the coins which were struck at our Mint on the occasion of the jubilee of the Queen were modelled in plaster, reproduced in intaglio by the electro-deposition of copper, and on these copper moulds hard excellent iron in layers of nearly one-tenth of an inch was deposited.

The exact processes of measurement which have led to such vast improvement in our telegraphic systems have scarcely yet penetrated into this field of electrical industry, and little is known at present of the exact relations of current and electro-motive force with respect to surfaces of contact, rate of deposit, and resistance of liquids. Captain Sankey, R.E., of the Ordnance Survey Department, has done some useful work in this direction. The extraction of metals from their ores by deposition has received wide application in the case of copper. In 1871 Elkington proposed to precipitate copper electrolytically from the fused sulphide of copper and iron known to the copper-smelter as regulus. Thin copper plates were arranged to receive the deposited copper while the foreign metals, including gold and silver, fell to the bottom of the solution, the process being specially applicable, it was supposed, to regulus containing small quantities of the precious metals. The electrical purification of copper from impure "blister copper" or "blade copper" has also made great progress, and special dynamos are now made which will, with an expenditure of 100 horse-power, precipitate 18 tons of copper per week. The impure metal is made to form the anode in a bath of sulphate of copper, the metal being deposited in the pure form on a thin copper cathode. It was not very long ago considered very economical to absorb 85 horse-power in depositing one pound of copper per hour, but now the same work can be done with 3 horse-power. Mr. Parker, of Wolverhampton, has done good work in this direction, and his dynamos in Messrs. Bolton's works have revolutionised this process of purification. Both at Swansea and Widnes immense quantities of copper, in spite of the restrictive operations of the copper syndicate, are being produced

by electro-deposition. Copper steam pipes for boilers are now being built up of great firmness, fine texture, and considerable strength by Mr. Elmore, at Cockermouth, by electro-deposition on a rotating mandrel in a tank of sulphate of copper. By this process one ton of copper requires only a little more than one ton of coal to raise the requisite steam to complete the operation. It has been shown that the electrolytic separation of silver from gold by similar methods is perfectly practicable. Although the old acid process of "parting" gold and silver remains practically undisturbed, there seems no reason to doubt that in the future electricity will render us good service in this direction as it has already in the purification of copper.

It is well known that the late Sir W. Siemens considered that the electric arc might render good service in the fusion of metals with high melting-points, and he actually succeeded in melting 96 ounces of platinum in ten minutes with his electrical furnace. The experiments were interrupted by his untimely death, but in the hands of Messrs. Cowles the electric arc produced by 5,000 ampères and 500 horse-power is being employed on a very large scale for the isolation of aluminium (from corundum), which is immediately alloyed (*in situ*) with copper or iron, in the presence of which it is separated. The heating power of large currents has been used by Elihu Thomson in the United States, and by Bernardos in Russia, to weld metals, and it is said to weld steel without affecting its hardness. It has even been proposed to weld together in one continuous metallic mass the rails of our railways so as to dispense entirely with joints. It is almost impossible to enumerate the various general purposes to which electricity is applied to minister to our wants and to add to our comforts. Every one appreciates the silent efficiency of the trembling electric bell, while all will sooner or later derive comfort from the perennially self-winding electric clock. Correct mean time is distributed throughout the length and breadth of the land by currents derived from Greenwich Observatory. Warehouses and shops are fitted with automatic contact pieces, which, on any undue increase of temperature due to fire, create an alarm in the nearest fire-station; and at the corner of most streets a post is found with a face of glass, which on being broken enables the passer-by or the watchful and active policeman to call a fire-engine to the exact spot of danger. Our sewers are likely to find in its active chemical agency a power to neutralise offensive gases, and to purify poisonous and dangerous fluids. The fact that the energy of a current of electricity, either

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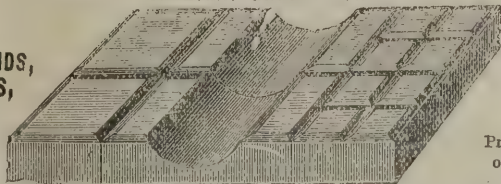
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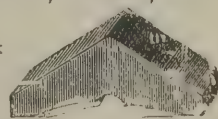
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when it flashes across an air-space or when it is forced through high resistance, assumes the form of heat of very high temperature led early to its employment for firing charges of gunpowder; and for many civil, military, and naval purposes it has become an invaluable and essential agent. Wrecks like that of the *Royal George* at Spithead were blown up and destroyed; the faces of cliffs and quarries are thrown down; the galleries of mines and tunnels are excavated; obstructions to navigation like the famous Hell Gate, near New York, have been removed; time-guns to distribute correct time are fired by currents from Greenwich at 1 P.M. In the operations of war, both for attack and defence, submarine mining has become the most important branch of the profession of a soldier and a sailor. Big guns, whether singly or in broadside, are fired, and torpedoes, when an enemy's ship unwittingly is placed over them, are exploded by currents of electricity. An immense amount of research has been devoted to design the best form of fuse, and the best form of generator of electricity to use to explode them. Gun-tubes for firing consist of a short piece of very fine wire, embedded in some easily fusible compound, while the best form of fuse is that known as the Abel fuse, which is composed of a small, compact mass of copper phosphide, copper sulphide, and potassium chlorate. The practice in the use of generators is very various. Some, like the Austrians, lean to the high tension effects of static electricity; others prefer magneto machines; others use the dynamo; while we in England cling with much fondness to the trustworthy battery. Since the electric light has also become such a valuable adjunct to war purposes, it is probable that secondary batteries will become of immense service. The strong inductive effects of atmospheric electricity are a source of great danger. Many accidental explosions of fuses have occurred. An experimental cable with a fuse at one end was laid below low-water mark along the banks of the Thames at Woolwich. The fuse was exploded during a heavy thunderstorm. The knowledge of the causes of a danger is a sure means for the production of its removal, or of its reduction to a minimum. Low tension fuses and metallic circuits reduce the evils of lightning, but have not removed them. Should war unhappily break out again in Europe, submarine mining will play a very serious part, and, paradoxical as it may appear—as has been suggested by the French ambassador, M. Waddington—its very destructiveness may ultimately prove it to be a powerful element of peace.

Electric lighting in America was described by Professor

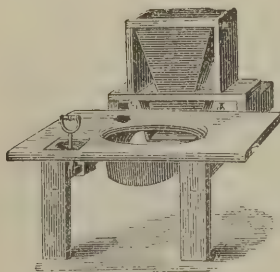
George Forbes. He spoke of the Westinghouse installations, and the advancement made by him in developing the high tension currents and transformed system of Messrs. Gaulard & Gibbs, which was first practically tried on the London Metropolitan railways some few years ago. Whereas in England we were still only talking of attaching electric lighting plant to houses, in the States the orders to the manufactories were coming in for town stations. The chief progress had been in America in three directions—arc-lighting, incandescent lamps with the three-wire system, and incandescent lamps run with converters—the latter an extension of the Gaulard-Gibbs system, which, in the States, has attained to the daily lighting of about 300,000 lamps. It was not, in the Professor's opinion, that the American machines and plant were better than those produced in this country—on the contrary. But the Americans had set to work in a different business way. They had taken a type of sufficiently good, not the best, machine, and had turned it out by machinery in three definite sizes. All the parts were made to the same pattern, each set by its own tools. Cheapness was thus effected, and if the customer required a new part to replace any breakage or defect, he had only to write or telephone its number to get one that would fit supplied. It was in this way business had been largely done, whilst in this country almost every machine produced was designed for some special duty. In America, too, there was no legal interference in the path of electricians, like the Act which had so long obstructed the way, and from which little or no tangible relief had been afforded by the amendment passed in the last session of Parliament. In the American adoption of the converted system, these high currents were limited to 1,050 volts, and the reductions brought the delivery currents into the houses to 50 volts. In this country the tendency was to deal with currents of 2,000 volts, and to reduce them to 100 volts at the lamps. The American electricians regarded the lower voltage as better for the longer endurance of the incandescent lamps. In England there was a disposition to advocate large engines, of the marine type; but in America a number of small engines were employed, for the reason that they could be put on as required and worked at their full load; and that in high tension currents the accident most likely to happen to the mains was short circuiting, by the contact of some broken telegraph or telephone wire, the electric light conductors being naked, and carried on street poles or over the housetops. The distribution was divided as much as possible, and as worked by a number of machines, the current, in case of accident, is not likely to be

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## TESTIMONIALS.

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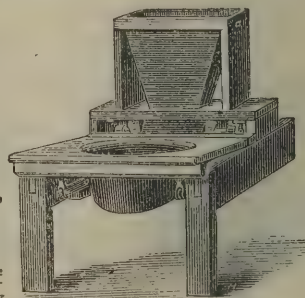
... The work was passed on Saturday, and the architect was very pleased with the closets.—Yours truly,  
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brought back in dangerous quantity, but the damage was absorbed by the whole group, or localised upon one item of it. In the American lighting-stations the machinery was run night and day, and the Professor thought too much trouble had been made about continuous running. The great ocean steamers worked their engines incessantly for days and even weeks together, and smaller engines ought to be more able to work for still longer periods without any fear of a breakdown. In Pennsylvania the natural gas was used for the steam-engines. It was very free from carbon, and when a high amount of heat was got from its combustion, on the principle of the Bunsen burner, the results were very satisfactory, and it could be automatically regulated, so that attendance could be very considerably diminished.

## PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

## APPLICATIONS FOR PATENTS.

12924. John Bradshaw, for "A chimney-pot or top." September 7, 1888.  
 12946. Timothy Line and James Daveney, for "An improved method or mode of manufacturing or fixing wooden wainscots and ceilings or other purposes to be named, and known as 'Poikiloculan.'" September 7, 1888.  
 12955. Alfred Julius Boulton, for "Improved closing devices for keyholes and locks." (Friedrich Eiche, Germany.) September 7, 1888.  
 12957. Thomas Sidney Shouler, for "Improvements in or relating to springs and checks for doors and the like." September 7, 1888.  
 12995. Robert Parry, for "Improvements in apparatus for cutting or dividing the length of clay emitted from brick or like machines." September 8, 1888.  
 13009. Richard Holdsworth and Herbert Garland, for "Improvements in door and other bolt locks." September 8, 1888.  
 13020. Arthur Everton, for "Improvements in bolts or fastenings to be used for securing doors, drawers, and for other purposes." September 8, 1888.

13030. Francis Fryer Abbey, for "A machine or apparatus for regulating the ventilation of main drains, conduits, and sewers, and all the connections attached to or communicating therewith." September 10, 1888.

13040. Hugh McKibbin, for "A novel arrangement of window-frames, sashes, and the fasteners therefor." September 10, 1888.

13049. Frederick Dolian, for "Improvements in dividers and compasses made of sheet metal." (Frederick Motz, United States.) September 10, 1888.

13155. William Joynson, for "Improvements in and connected with roof gutters." September 12, 1888.

13158. John Lawson, for "Improvements in apparatus for heating buildings and other purposes by combination of air and water." September 12, 1888.

13167. William Jago, for "Improvements in bakers' ovens." September 12, 1888.

13177. Robert Thompson, for "A new or improved combination of lavatory and water-closet basins." September 12, 1888.

13211. Jesse Rust, for "An improved vitreous material for paving and other purposes." September 13, 1888.

13259. Will. Richd. Pullen, for "Mosaic work in crystalline glass, and means, modes, and processes in producing the same." September 13, 1888.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

8874. Emilie Jane Tobin, for "An improved system of ventilating dwellings and other structures." June 23, 1888.

10298. For "Improvements in chimney-pots." July 16, 1888.

10882. Edw. Kerry and Edw. Campbell Kerry, for "An improved joint for drain and other pipes." July 27, 1888.

11053. Fred. Wm. Wetherell, for "Utilising blast furnace slag in the manufacture of bricks for refractory or ordinary building purposes." July 31, 1888.

11198. Edw. Brooke, of the firm of Edw. Brooke & Sons, for "Improvements in the burning of white or coloured glazed brick and pottery ware." August 2, 1888.

11238. Sidney Edwin Edmonds and Will. Timbrell, trading as W. E. Blackwell & Co., for "Certain improvements in catches or fasteners for doors, gates, French windows, and the like." August 3, 1888.

11290. Edward Young Poole, for "Improvements in roofing tiles for the purposes of utility and ornament." August 4, 1888.

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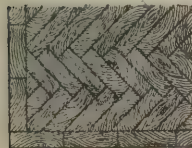
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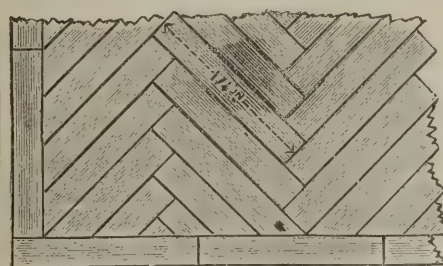
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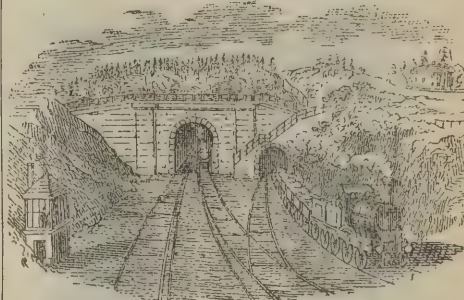
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11433. John Jackson, for "Improvements in radiators for warming and ventilating buildings." August 8, 1888.

11483. Geo. Hy. Planner, for "A disinfecting apparatus for water-closets." August 9, 1888.

11530. Edward Lund, for "Reference markers for book-cases and libraries." August 10, 1888.

11908. Walter Stock, of firm of Stock, Son & Taylor, for "Improvements in flushing apparatus for flushing water-closets, urinals, and other places." August 17, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

12796. Frank Moore and William John Fieldhouse, for "Improved close-and-open fire cooking range." September 21, 1887.

13988. William Henry Foster, for "Improvements in ball-taps." October 15, 1887.

14656. Thomas Glennie, for "A new system of sewage disposal." October 28, 1887.

14776. Samuel Timings and Samuel Hill, for "Certain improvements in spring-catches, or spring-fasteners, for doors, windows, and the like." October 31, 1887.

14951. Thomas Minton, Herbert Minton-Senhouse, Herbert Minton-Robinson, James Clegg, and Jos. Lea, for "A new method of painting upon pottery and tiles." November 2, 1887.

15372. Joseph Morris, for "An improved ventilator and chimney-cowl." November 10, 1887.

15483. John Boulter, for "An automatic indicator for water-closets and other apartments." November 12, 1887.

15666. George Moffatt Rhys Layton, for "Improvements in the manufacture of cement." November 15, 1887.

17556. Harry Stockman, for "Improvements in ventilators." December 21, 1887.

17967. Benjamin Gregory, for "Improvements in the manufacture of blue bricks, tiles, fire bricks, and the like." December 31, 1887.

19591. Edward Thorp, for "Wind and water bars for meeting rails, top and bottom rails, of sliding sashes; top rail and stiles for casement sashes; top rail and stiles of doors." July 2, 1888.

#### PATENTS SEALED, SEPTEMBER 14, 1888.

9269. Joseph Pratt, for "Improvements in constructing horticultural and other buildings." June 30, 1887.

11957. James Frederick Wiltshaw, for "Improvements in the mounts of door and other knobs." September 3, 1887.

11961. Benjamin Turner, for "Improvements in door-springs." September 3, 1887.

1715. Alfred William Mitchell, for "An improved device or appliance for securing slate to roofs." February 4, 1888.

7670. John Harrison, for "An improved machine for sawing stone." May 25, 1888.

#### ABRIDGMENTS.

"Improvements in exit ventilators for rooms and other places where down draughts are to be avoided, &c." No. 14431. 1887. J. W. Gibbs, 4 South John Street, Liverpool.

*Claim 1.*—An exit ventilator for rooms or the like, consisting of a suitable framework of papier-mâché or similar composition, and of one or more flaps or valves, and composed of asbestos, card, or mill-board, or of similar soft non-inflammable material, substantially as and for the purposes described.

"Lock bricks." No. 7815. 1888. J. L. Champion, Newquay, Cornwall. An ingenious invention, consisting of an ordinary brick, having a dovetailed shaped opening in on one side, whereby the said brick is locked to another similar brick, placed parallel with the same by means of a cross brick or tie, made to fit into the said dovetail openings at each end.

*Claim 1.*—The making of those especially designed bricks for locking together, as herein described and shown.

"Improvements in the utilisation of slate, slate waste, black grit, &c., in the manufacture of glass and other articles." No. 8129. 1888. W. J. Parry, Coetmor Hall, Bethesda, Bangor; and Mr. J. T. Welch, 32 Penhryn, Bethesda. This useful invention is principally for using up materials at present wasted, for the manufacture of glass and such like substances, which can thus be produced at a very low price.

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# The Architect.

## THE WEEK.

THE first autumn exhibition of pictures, which was opened in the Municipal Art Gallery of Wolverhampton on Monday last, contains between five and six hundred works. The loan collection is of importance, and includes Mr. ORCHARDSON'S picture representing VOLTAIRE relating the insult offered to him when he was horsewhipped for a lampoon; Mr. MADOX BROWN'S *Work*, which has happily found a resting-place in the Manchester Art Gallery; Mr. HENRY MOORE'S *Moun's Bay*; Sir EDWIN LANDSEER'S *Chantrey's Studio*, which is a portrait of the sculptor's favourite dog; Mr. JOHN FAED'S *Sculptor's Dream*. There is a picture by GUSTAVE DORÉ of a group of poverty-stricken women, which will not sustain the reputation of the painter. Local art is well represented. It is proposed to open the exhibition to the public on several days without payment.

M. ANTONIN PROUST has, on behalf of the special committee, sent a report to the French Minister of Fine Arts upon the arrangements of the art section in next year's International Exhibition. It is proposed to have six divisions of the section. The first relates to French art belonging to the period between 1789 and 1878. The second division will be international, and comprise works which were produced between 1878 and 1889. In the third division, which will be found in the Trocadéro, monumental art will hold sway, including casts, designs, photographs, &c. A division will be assigned to works which will exemplify instruction in art. The space under the cupola of the galleries of industry will be appropriated by the fifth division, which will be one of the most interesting, as it will represent the work produced in national manufactories—Gobelins, Sèvres, &c.—during the century. Finally, as becomes a French exhibition, the theatre will have its division, in which the construction of theatres, stage machinery, costumes, decorations, &c., will be shown by models and examples.

THE classes for the study of architecture at University College, London, will as usual be opened by Professor ROGER SMITH with a public lecture, the subject of which is announced to be "Mistakes in Architecture." This will be delivered at the college on Thursday evening, October 4, at 7.30 P.M.

THE sudden death of M. GUSTAVE BOULANGER will be regretted by many people, and among them will be the English students in his *atelier*, for whose progress he was most zealous. He was simple in his way of life. M. BOULANGER lived alone in a very small house, and, when he desired to see a doctor, he had to call an attendant from an adjoining house. Unfortunately aid came too late. He had attained the highest honours which an artist can expect in France—a seat in the Institut, a professorship in the Ecole des Beaux-Arts, and the Legion of Honour. M. BOULANGER could hardly fail to be considered as a representative of Academicism, but although he painted subjects which, from their titles, might be supposed to belong to that form of art, no one could have less of the mannerism which is ascribed to Academic painters. He began his career with JOLLIVET, who believed in a pupilage of fifteen years. The danger which might arise from so long a term of plodding over exercises was obviated by a voyage to Algiers. When he returned he had gained new ideas about colour and light. Art became more of a pleasure to him, and in 1849 he was able to carry away the Prix de Rome. His paintings fall into two classes—ancient Roman scenes and African scenes. Most of the pictures which he sent to the Salon during thirty years are known by engravings. Among his public commissions may be named the paintings in the Foyer de la Danse of the Paris Opéra House, and the large work in a Mairie which was illustrated in *The Architect*. In the latter work he introduced portraits of several artists. As the head of one of the great *ateliers*, M. BOULANGER was able to exert influence over the younger artists. Every work was rigorously examined, and many a study became valuable by his emendations. If a

student undertook a painting, he was sure of M. BOULANGER'S advice, no matter how many flights of stairs had to be mounted for that purpose. Indeed, it may be said that his efforts to raise the character of his school helped to shorten the painter's life. M. BOULANGER was the husband of Mdlle. NATHALIE, of the Théâtre Français, who died some years ago.

THE re-erection of the chancel of the great church of Cromer, which was blown up by a clergyman of puritanic tendencies because it was supposed to interfere with his way of conducting a service, is now almost complete. The work has been executed with extreme care by Mr. THOMPSON, of Peterborough, and the details correspond with those of the nave. The chancel arch is boarded, and the plain boards, although rather surprising at first sight, may be said to be in keeping with the gauntness of the remainder of the church. The restoration being expensive, and as the congregation varies greatly in number, various modes of raising funds have been adopted. One of the most ingenious is the distributing of tickets of admission to Mrs. BOND CABELL'S park, for which a sum is charged. Cromer is increasing in size, and now contains many large houses of red brick, which are prudently erected at some distance from the shore, and in course of time there ought to be little difficulty in discharging all debts on the church fabric.

AN honorary correspondent of the Society for the Preservation of Ancient Buildings writes:—"The following is extracted *verbatim et litteratim* from the September issue of the *Ormskirk Parish Church Magazine*:—"The parishioners will be glad to know the destination of the old oak benches. They are being sent to a school of art in Boston, U.S.A. A gentleman has bought them for the purpose, and the vicar and wardens have received the sum of 80*l.* for them, which amount is lodged in the bank to the credit of the restoration fund. We retain a few of the old seats in the church." A correspondent of the *Manchester Guardian* says in reply:—"As regards the merits of the restoration question, treated as a whole, I have not a word to say. I know that some archaeologists prefer to see a building become dangerous, or indeed come tumbling down, rather than that any rude hand should stay or prevent the process. But the head and front of our offending is those unlucky benches. I have sat on those seats, and have tried, as a good churchman should, to kneel between one seat and another as they were 'archæologically' placed. And if you, sir, had had the same experience, you would have eloquently written that they were magnificently absurd seats, totally unfitted for their purpose, productive of excruciating discomfort, not to say pain, and actually the worst attempt at a comfortable church sitting that our unfortunate century has witnessed." As we said last week, the public in many cases are suspicious that archaeologists prefer to leave buildings to tumble down.

THE strike of the riveters employed on the Eiffel Tower having come to an end, and the work of erection being resumed, the committee of taste associated with the International Exhibition have discussed the question of how the mighty combination of lattice girders should be coloured. In the end it was decided that a reddish-brown would be the most effective colour. It would be a tedious process to emphasise the details of the tower, and as the greater part is made up of bars divided by open spaces, a single colour is not likely to appear heavy. Red will also look well when seen against the clear sky of Paris, and lastly, it will help to distinguish the tower from all the builders' work in the district.

THE *Inland Architect* of Chicago records the collapse, on the 22nd ult., of the lofty tower and spire of the new church of the Covenant, Washington. It, so it is stated, "collapsed and sank in ruins without apparent cause except inherent inability to stand up any longer." The disintegrated tower telescoped completely. The architect, Mr. J. C. CADY, who should be able to judge, says that the weight of the upper part of the tower, which was in all 138 feet high, rested chiefly on three piers between the entrance arches of the first storey, and that these were amply strong to support ten times the load; he considers that quicksand below the footings may explain the failure.



## MUSEUMS AND ART GALLERIES.\*

THE old-fashioned museum might have been suggested by ROMEO's description of the Mantuan apothecary's shop, for it was in part made up of tortoises, stuffed alligators, and skins of ill-shaped fishes. Anything which came from some distant land, anything which seemed to be a freak of nature, was a welcome addition in such places. The museum was, in fact, a receptacle for whatever was uncommon from earth, sea, or sky. Indeed, one of the characteristics of the predecessor of the modern archæologist was his fondness for the curiosities of natural history. According to the description of him, "his chamber is commonly hung with strange beasts' skins, and is a kind of charnel-house of bones extraordinary." There is still use for a collection of odds and ends which relate to nature and antiquity, but it is no longer desirable that a museum should be a place which can only serve to amaze the rustic sightseer.

But when we come to ask what better principle should be adopted for constituting museums, it is not easy to find an answer. It is well to have a storehouse for things made by man's hand which have contrived to survive from a past age; and, on the other side, a student of natural history will prefer a collection of old bones before the best examples of Mediæval metalwork. Is it possible to satisfy the desires of all classes of students, especially when there are no means of purchasing objects except chance contributions? Then, again, there is a supposition that a museum should be an aid to trade by containing examples from which a designer and workman could learn something. Can a museum of antiquities and natural history be also made to subserve that end? If we take the book lately issued by Mr. GREENWOOD as a guide, we find that the uses of a museum are expected to be still more varied in character. According to him a museum should "provide rational amusement of an elevating character to the ordinary visitor," in addition to "providing a home for examples of local objects of interest of an antiquarian, geological, or other character," and "specimens of manufactures resembling those produced in the immediate locality."

No doubt it would be practicable to form museums of that kind, just as in literature it is possible to prepare an encyclopædia. But as no one who cares to master a subject would trust to the most voluminous work of the encyclopædic class, preferring to obtain special treatises, so it may be said that most of the museums which are supposed to be comprehensive, but must be incomplete in every department, will always be unsatisfactory to anyone who desires more than a slight gratification of his curiosity. We cannot expect many museums of the British Museum and South Kensington types, and any attempt to imitate them on a small scale is little more than a waste of labour. With limited means we cannot expect too much, and provincial towns would, therefore, do well to consider whether greater utility is not derivable from a museum with a definite and restricted purpose than from one which will be more suggestive of the things which are absent than of those which were in view.

The fact is, that when a miscellaneous collection is once set up in a county town, it is almost impossible to exclude rubbish. A curator is always troubled with the sight of his empty cases, which are supposed to be a slur upon him, and he will accept anything for the moment. But what is the use of looking at such objects as "the clogs worn by the poet SOUTHEY"? and in most museums we see still more startling examples. Can we imagine that they will do much for the education of the people?

Mr. RUSKIN is supposed to be a visionary, and at times he has written as if he were possessed of more than human power; but among his numerous good deeds was the setting up of a museum which might serve as a model for local authorities who are willing to expend a part of the rates on museums. The house in Walkley where Mr. RUSKIN's treasures are stored is too small to accommodate more than a few students at a time, and it is too remote from Sheffield to allow of a visit on a wet day. But the jewels within compensate for the defects of the casket.

Unlike most museums, there is nothing at Walkley which is suggestive of rubbish. As becomes a son of Oxford, Mr. RUSKIN is strong in logic, and what is seen serves to prove that the world is full of beauty in form and colour, and that in past ages the workmen brought themselves into relation with nature by trying to make their work beautiful. It is essentially a museum for producers, and a day spent there would be more profitable for an operative than a year's wandering through miscellaneous collections. Mr. RUSKIN did not seek to instruct mineralogists or ornithologists when bestowing his minerals and drawings of birds, although men of those classes might learn a good deal at Walkley, his aim being "to show the influence of the character of the workman upon the arts, and to indicate the circumstances which produce the finest art, and thus the finest men and women." There is a unity, therefore, in the collection, which must be a surprise to a visitor who has had experience of ordinary museums. In every museum a similar principle should be adopted, and in proportion to the extent in which unity prevails, will be the success of the collections.

Another museum which is also useful, although most limited in character, is one in Norwich. It receives, however, scant notice in Mr. GREENWOOD's book. In the Norwich Museum ornithology is predominant, and until recently that department could vie with what was to be seen in the British Museum. Students of natural history will also find much else that is interesting, and there is besides a fine collection of antiquities of the county. Admission to the museum is readily given, but all the expense is borne by subscribers. Most of the contents were furnished by the GURNEY family, who are omnipotent in Norfolk. It is not a trade museum, nor intended to aid designers; but, within the limits laid down by the founders, the Norwich Museum is most satisfactory. It suggests what can be done when a few men have a definite purpose in view; and, should the offer of Mr. GURNEY be accepted, and the old prison of Norwich Castle be converted into a museum at his expense, it is to be hoped that the control will still be retained by a committee who have done so much good work.

As yet England is without commercial museums; but in those which we have seen abroad there is a definiteness which should be imitated in this country. The contents are systematically arranged, and there is nothing introduced which can divert attention from manufactures and commerce. A foreigner can see what is obtainable in the district represented by the museum, and in most cases that is of more importance to him than any specimens of ancient manufacture.

England, which is the land of specialists, suffers in respect to museums from the influence of men who cannot claim to be masters of any one department of knowledge. Look, for instance, at the stuff which for years has represented English building and engineering at South Kensington. A hodman could hardly go through the galleries without laughing; but what did HENRY COLE and the other officials of the Department know about construction? They acted according to their lights, which were dim enough, and as long as we leave the control of museums to men of their caste, we must expect similar fiascos. In the British Museum, most of the departments are controlled by chiefs who can claim to be specialists; but we cannot suppose that the museums in country towns will ever be so fortunate. Each will have a single curator at the most, and his qualifications must necessarily be limited.

There is at the present time a strong desire to establish museums throughout the country; but care must be taken in establishing them to do nothing that will cause disappointment. It will be vain to open them if they are expected to combine "rational amusement," archæology, and commerce. Our time is one of struggle, and if museums can aid us in producing better goods than our foreign rivals, let them be set up in every manufacturing district. But there is no use in treating affairs of business as if they were of no more concern to us than archæology, as will appear to be done if past and present are divided by no more than thin partitions. Industrialism is a serious affair, and we shall not be gainers if we turn it into "rational amusement," or make it a subject for speculation and talk, which is all the majority of archæologists attempt. We are far

\* *Museums and Art Galleries.* By Thomas Greenwood, F.R.G.S. Simpkin, Marshall & Co.



from denying the advantages or the interest of archæology, but what most people seek when they think of opening a museum in a town is not an extension of their knowledge of ancient ways. Let archæological museums be formed in every county of England; but what we now most need are industrial museums, which will have as close a relation as possible to the manufactures of the neighbourhood.

As we glance over the descriptions of museums in Mr. GREENWOOD's book we find that there are towns which frankly accept the conditions of the problem which is before us. Birmingham has not only a free library, which is endowed with the most expensive technical books, and a catalogue which, so far as it goes, is a guide to the student, but it has a collection of examples of metalwork, glass, pottery, and textiles which is invaluable. The gifts are already worth about 50,000*l.*, and as the utility of the art gallery is manifested they are sure to be largely increased. Manchester has as yet no industrial museum that can be considered as worthy of so great a city, but, thanks to the Whitworth Trustees, the deficiency will soon be supplied. Salford has a museum, but industrialism is not sufficiently represented in it. In all towns of the kind there is a reliance on the South Kensington Loan Collection to make up the deficiencies of the museum, and indeed some curators believe that continual change is necessary in all museums—a statement which suggests that amusement is supposed to be the first desideratum of a collection. Hence the importance which a piece of carved wood in the Northampton Museum assumes in the eyes of visitors. It is said to have occupied the amateur 5,941 hours, and the sacrifice of so much time is supposed to be heroic, although the result is worthless. A piece by GRINLING GIBBONS, or by one of the Sienese carvers, if placed beside the product of so many wasted hours, would probably be passed over. Yet philanthropists still persist in maintaining that the interests of the better classes of the community should be sacrificed to give amusement by means of amorphous objects. We grant that something must be sacrificed for the purpose of attracting visitors to a museum. But the success of the promoters of the Manchester Art Museum shows how much can be done by earnest men when they try to reveal the importance of what is good to the ignorant. An engraving in that way is found to have as much interest as a stuffed sparrow with four legs.

So long as museums have to serve a variety of purposes it is difficult for curators to determine the dispositions of rooms, and hence architects are often obliged to depend on suggestions which are afterwards found to be inadequate. At present, in the majority of English museums, natural history absorbs most of the space, and arrangements for the display of stuffed birds or fishes and fossils will not necessarily serve for all industrial products. There may need to be variations in the lighting, the height and form of the rooms. But curators consider a museum building should be elastic, and have little hesitation in transferring their collections from one part to another without much regard for light or space. There is often, in consequence, much grumbling, of which the architect is the victim. We do not believe that the country gains much by the devotion of museums to natural history, and we should prefer to see the establishment of independent buildings for industrial examples rather than the setting apart of a room or two for that purpose in the neighbourhood of the department of fossils. No matter what curators may say, a museum cannot by any contrivance become all things to all men; and as there had to be a separation in Bloomsbury a similar revolution should take place elsewhere.

Mr. GREENWOOD's sympathies are with naturalists rather than with manufacturers, and the conclusion derived from his book is that more should be done towards the creation of museums of natural history. But as the need of the time is for museums which shall make men derive increased interest from their trades, we believe natural history can wait. We may differ from Mr. GREENWOOD, but we must recognise that he has spent much toil in amassing information about English and foreign museums, and his book will be useful to many. It suggests how much remains to be done before the country can be said to possess a sufficient supply of museums; and hence it is worth the study of politicians and the public in general.

## ANCIENT ARCHITECTURE AND SCULPTURE.\*

By A. S. MURRAY.

IN the west half of the Lycian Room is the tomb of a Satrap of Lycia, with a roof in the form of a pointed arch surmounted by a ridge. On each side of the roof is a relief representing an armed figure in a *quadriga*; along the ridge are reliefs; on one side a combat of warriors on horseback and on foot, and on the other a hunting scene; in the western gable is a small door for introducing the body of the person interred in the tomb. On one side of the tomb is a relief of warriors on foot attacking cavalry; on the opposite side is a Satrap seated, apparently receiving a deputation; at one end is a draped male figure, who appears to be crowning a nude figure; at the other end are two figures, armed with cuirasses, one of whom appears to be crowning the other. Inscriptions in Lycian characters are incised above this frieze on the north and south sides of the monument, in the frieze itself on the east side, and on the north side of the ridge which crowns the roof. According to the latest interpretation of these inscriptions they record the building of the tomb of Paiafa, a Lycian, for himself.

In the east half of the room is the roof of a similar tomb. On one of the sides of the ridge is a battle-scene between warriors on foot; on the other a banquet, a figure crowning an athlete, and a group of aged figures conversing. Below these reliefs is, on each side of the roof, Bellerophon in a *quadriga* attacking the Chimaera, in low relief; he is accompanied by a charioteer. On the south side of the monument is an inscription in Lycian characters, which, according to the latest interpretation, records the name of Mārāhi, the builder of the tomb, and that of the sculptor employed on it.

In the west half of the room is a restored model of the edifice commonly known as the Nereid Monument, discovered at Xanthos by Sir C. Fellows, under whose direction the model here exhibited was made. In the pedestal on which this model stands are inserted a ground plan, showing the position of the remains when found *in situ* by Sir C. Fellows, and a picture of the scene of the discovery. The monument, as thus restored, is an Ionic peristyle building, with fourteen columns placed round a solid *cella*, and with statues in the intercolumniations, the whole elevated on a basement, *podium*, which stands on two steps. This building was supposed by Sir C. Fellows to have been a trophy in memory of the conquest of Lycia by the Persians under Harpages, B.C. 545; but this is not probable, as the style of the architecture and sculptures shows that it must be assigned to a much later date. Recent authorities suppose this monument to have been erected in the first half of the fourth century, B.C., in honour of a native Satrap or ruler of Lycia, probably the Satrap Perikles, who, as we know from a fragment of Theopompos, attacked and captured the town of Telmessos.

On the walls of the room are the several friezes which decorated the building, some slabs of the broad frieze which is believed to have encircled the lowermost part of the basement, representing a battle between Asiatic warriors, some of whom are mounted, and Greeks. These are placed round the west half of the room. Some portions of the narrow frieze which ran round the uppermost part of the basement, and which represented, according to the most recent interpretation, four scenes—an attack upon the gates of a fortress, the siege of a fortress, the capitulation of a fortress, and battles in the open field. These slabs are placed on the north and south walls of both the west and the east divisions of the room. A slab, in the west side of the room, is an assault upon a fortress with the aid of a scaling-ladder; on the next slab are warriors advancing to the attack in single file; scenes of combat; warriors advancing, probably to attack the fortress, which is represented in the eastern half of the room. On the same wall, and on the opposite wall, scenes of battle, prisoners being conducted in single file. The next three represent probably the same fortress after its capture. On one is a Satrap seated, and attended by a slave holding a parasol over his head; the figures advancing towards him are probably the vanquished enemy tendering their submission. Above the lower line of fortifications is seen a tomb surmounted by a sphinx between two lions; warriors standing conversing, and warriors advancing in single file. Slabs of a narrow frieze which encircled the *cella* of the monument, and which represents a banquet, with a sacrifice of rams, bulls, and goats. On the eastern wall are slabs of a narrow frieze which surmounted the columns of the peristyle, representing a battle of horsemen and warriors on foot. Scenes representing the chase of the bear and wild boar, from the same frieze; also on the adjacent north wall figures bringing offerings. A part of the tympanum of the eastern pediment of the monument, containing sculptures in relief, representing two seated figures, probably divinities,

\* From a description taken from the "Guide to the Exhibition Galleries of the British Museum," of the collection of architectural and sculptured remains obtained from ancient cities in Lycia.



approached by worshippers. One-half of the tympanum of the western pediment contains a relief representing a battle between cavalry and infantry. Above the two friezes in the west half of the room is a restoration of the cornice of the basement, with the columns and statues which surmounted the stylobate. The plaster casts employed in this restoration have been made from figures and architectural members in this room. A column, two portions of columns, and three capitals from the peristyle, and a piece of moulding from the cornice of the basement; coffers of the ceiling; capitals of pilasters; roof tiles and other architectural members; statues which stood in the intercolumniations. They represent female figures moving rapidly, which from the marine emblems under their feet are probably Nereids, or possibly personifications of cities on a sea coast. One has under her feet a crab; the others, a fish, perhaps the tunny, a sea bird, a shell, and a dolphin. Fragments of similar figures; two draped female figures in rapid motion, from the *akroteria* of the pediments; fragmentary groups of youths carrying off female figures, conjecturally placed on the apex of either pediment; lower portions of two figures in rapid motion, from the north and south ends of the west pediment; two crouching lions found at the base of the monument, and in the model conjecturally placed within the colonnade. A representation of similar lions may be seen on the summit of a tomb on slab No. 35, of the narrow frieze of the basement. Three draped female torsos, of an architectural character.

In the east half of the room is a slab representing the bust of Diana in relief between Doric triglyphs, from a Roman arch at Xanthos. In the west half of the room is a square monument of the Roman period, with reliefs of Plutus and Fortune on one side, and a Persian shooting at various animals on a mountain on the other; three pieces of moulding. On the east side of the room are casts from the reliefs of a tomb cut out of the sold rock at Pinara, with representations of an ancient walled city built on rocky ground. On No. 108 are represented tombs near the city, two of which are similar in form to the tombs exhibited in this room. On the same wall are casts from the sculptures of a rock-tomb at Myra, coloured to represent its condition when the casts were made. On the opposite wall are casts from a relief of a draped male figure and from the sculptures of the gable ends of two tombs. On one are two female figures, probably Hierodules, wearing short chitons and dancing; on the other are two lions devouring a bull; above them a Lycian inscription. In the west side of the room are casts from the relief of a rock-tomb at Kadyanda. Near several of the figures are bilingual inscriptions in the Greek and Lycian languages. The group of figures on the extreme left is engraved as the frontispiece of Fellows's "Discoveries in Lycia." On the opposite wall are casts from the sculptures of a rock-tomb at Pinara; a portion of the pediment; one of the Gorgons' heads with which the ends of the dentils were decorated; another from the frieze represents warriors escorting captives. In the west half of the room are casts from sculpture at Tlos; a relief representing Bellerophon attacking the Chimaera, and a monolithic pedestal on the four sides of which are the following subjects in relief—the siege of a city, the combat of two horsemen, of an armed Greek on foot against an Asiatic on horseback, and two combatants on foot; above this pedestal is a smaller base on which are figures in relief.

Towards the west side of the room of archaic sculpture are placed the reliefs from a monument which stood on the acropolis of Xanthos in Lycia, and is generally known as the Harpy Tomb. The sculptures originally decorated the four sides of a small chamber, which stood upon a rectangular solid shaft, about 17 feet high. The style indicates a date probably not later than B.C. 500. The subjects of the reliefs have been variously interpreted; on the sides facing east and west are at the angles Harpies bearing off small draped female figures. Between the pair of Harpies on the east side is a male deity seated, who receives a helmet from a warrior standing before him; under the chair of the seated deity is a bear. Under the Harpy on the right is a small female figure kneeling in a suppliant attitude. Between the pair of Harpies on the opposite side of the monument is a seated divinity of uncertain sex, in front of whom a draped female figure stands offering a dove. The seated divinity holds in the left hand a pomegranate fruit, in the right a fruit or an egg.

On the side now facing the north, but which was originally the west side of the tomb, are two goddesses seated on thrones facing each other. The one on the right holds in her right hand the flower, and in her left the fruit of the pomegranate. The figure opposite holds in her right hand a *phiale*. In front of this figure is an oblong aperture which may have been closed by a stone in the form of a *stèle*. The figure of a cow suckling her calf, above the aperture, would then have formed the *epithema* of the *stèle*. On the right of this opening are three draped female figures, advancing in single file towards the goddess, who holds the pomegranate fruit and flower. The second of the advancing females holds in her right hand a

fruit, in her left a flower of the pomegranate; the third holds up in her right hand an oviform object, thought to be an egg. The goddess to whom these figures advance may be Persephone, and the goddess behind them Demeter.

On the south side is a male deity seated on a throne, and holding in his right hand a pomegranate flower, before whom stands a smaller draped figure offering a cock. Behind this smaller figure a draped male figure, holding a staff in his left hand, advances, accompanied by a hound. Behind the seated deity two draped female figures advance; the foremost of these holds in her left hand a pomegranate fruit. The small figures at the angles carried off by the Harpies have been thought to be the daughters of the Lycian hero, Pandareus. Another conjecture is that these figures represent the souls of mortals snatched away by untimely death. The subjects of the reliefs on the four sides of this tomb have all probably a funereal import, but archæologists differ widely in their explanations.

Along the north and south sides of the room are arranged ten seated figures, a lion and a sphinx, brought from the Sacred Way leading up to the temple of Apollo at Branchidæ, in 1858. These figures are among the earliest and most important extant specimens of Greek sculpture in marble. Their date probably ranges from B.C. 580 to B.C. 520. On the back of the lion is an inscription in five lines, written *boustrophedon*—that is, with the lines beginning alternately from right and left—and in very ancient characters, containing a dedication of certain statues as a tenth to Apollo, by several persons who were probably citizens of Miletus. One of the seated figures represents, as we learn from its inscription, Chares, ruler of Teichioussa, who dedicated this statue of himself to Apollo. On another of the figures is part of the name of the sculptor who made it.

On the north side of the room is a block of marble with an archaic Greek inscription on two sides, recording a dedication of some work of art by the sons of Anaximander, and the name of the artist, Terpsikles. This is also from Branchidæ.

In the centre of the room is a stone chest from the top of a *stèle* or columnar tomb. On one side is a man stabbing a lion; on the opposite side are a horseman, a warrior on foot, and an attendant, in very low relief. At one end is a lioness fondling two cubs; at the other end a lion devouring a bull. From Xanthos in Lycia.

On the north wall are plaster casts of four metopes from two of the temples at Selinus in Sicily. The three complete metopes, representing a chariot group, Perseus cutting off the head of Medusa, and Herakles carrying off the Kerkopes, belong to the oldest of these temples. The fragment representing part of a group of Athenè overpowering a giant is from a later temple. Under these metopes is a marble frieze with reliefs of satyrs and wild animals, from Xanthos in Lycia; and a relief of female figures moving in a procession; from Teichioussa, near Branchidæ.

On the opposite wall is a marble frieze representing a procession of chariots, horsemen, and foot-soldiers; the gable end of a tomb, on which are sculptured two seated male figures facing each other, between whom is an Ionic sepulchral column surmounted by a Harpy; and other similar portions of tombs with figures of sphinxes in relief. Higher up on the wall is a narrow frieze with figures of cocks and hens. These sculptures are from Xanthos in Lycia. To this wall are also attached two plaster casts; the one from an archaic relief on the Acropolis of Athens, the other from a relief in the Villa Albani, generally known as the Leucothea Relief, which in style and subject resembles the reliefs on the Harpy tomb. Along the west side of the room are the following statues and heads:—A draped female torso from a temple at Rhamnus in Attica; a small figure of Apollo brought from the east by Percy Clinton, Viscount Strangford; another figure, perhaps also representing an archaic Apollo, from Greece; a statue of Apollo, of a somewhat later period, formerly in the Choiseul-Gouffier collection; an ancient copy of an archaic head of Apollo, from the Townley collection; four terminal heads of Dionysos and Hermes; fragments of reliefs found under the foundations of the temple of Diana at Ephesus, and supposed to have belonged to the older temple. At this end of the room are placed a plaster cast from the marble statue of Victory, by Paionios, and casts of two metopes from the temple of Zeus at Olympia. The figure of Victory was erected at Olympia to commemorate a battle either in B.C. 425, or between B.C. 456-452.

On the east side of the room are an archaic inscription from Sigeum in the Troad, written *boustrophedon*, recording a dedication by Phanodikos of Prokonnesos, and giving the artist's name Aisopos. This inscription was known to travellers for some time previous to its removal by Lord Elgin, and has been repeatedly published. An inscription from Halikarnassos, in the Ionic dialect, which contains a decree of the people of Halikarnassos and Lygdamis in their joint names, and having reference to the legal title to certain houses and lands of which the ownership was in dispute. The Lygdamis who is named as a party to this decree was probably the tyrant of that name



who ruled at Halikarnassos about B.C. 450. A rock-cut figure of calcareous stone, found near Smyrna in 1869.

On the east side of the room are an archaic inscription from Cape Taenaros in Lakonia, presented by Dr. Mullen, R.N., and recording the enfranchisement of a slave. An archaic inscription from Ephesus, relating to divination by the flight of birds. A bull, probably from the top of a sepulchral *stèle* at Athens. Presented by Lord Hillingdon.

On a shelf and in a case against the east wall are placed architectural fragments from the site of the temple of Apollo at Naukratis, discovered by Mr. W. Flinders Petrie, and presented by the Egypt Exploration Fund.

#### GLASGOW ARCHITECTURAL ASSOCIATION.

THE first lecture of the session was given on Tuesday, the 18th inst., by Mr. Thomas Gildard, president, on "Recollections and Reflections." The lecturer's experience of professional life dates back for some fifty years, when as an apprentice he entered the office of Messrs. David & James Hamilton, then among the first architects in Scotland, and well known by works of such importance as Hamilton Palace, Glasgow Royal Exchange, Western Club, &c. From their office came several who themselves earned reputations with designs which adorn the city. Of these were Mr. Charles Wilson, architect of the High School, Faculty Hall, Queen's Rooms, Free College, &c.; Mr. Richard, known by his Wallace Monument, Park Church, Bank of Scotland, &c. Reminiscences of these and many others were given, a comparison with present practice showing how great is the change. Their success must be appraised with a remembrance of the difficulties overcome, lack of travelling facilities, and the limited professional library at their disposal. The art of ancient Rome was then alone favoured, giving place later to a purer style, when the publication of such books as Stuart and Revett's "Athens" discovered the fount of Classic architecture. The still later change of popular taste—the revival of Mediævalism—disturbed yet again professional conservatism, and Mr. Gildard gave a review of the earlier efforts in the new style. The latter part of the lecture was devoted to a consideration of the principles which influenced the designers in these varied phases of art, and which should rule with their successors, even when an extended range of material, such as cast-iron and plate-glass, is called for by the altered social condition of our times. At the conclusion of the paper, after remarks by Mr. John Baird, architect, a former office companion of Mr. Gildard, a vote of thanks was passed to the lecturer.

#### EAST SHEFFOLD OLD CHURCH.

THE restoration of the quaint and interesting church of East Shefford has been carried out by Mr. Walter Money, F.S.A., who has furnished the following account to the *Reading Mercury*. The restoration, Mr. Money says, of this ancient building has been carried out in a most conservative spirit, the greatest caution having been exercised lest the history of the structure should be obscured, as that of many of the neighbouring churches has been, by ignorant innovations, or valuable remains of past ages be destroyed in deference to mere utilitarianism.

It may always be assumed, in default of proof to the contrary, that every Mediæval church stands on the site of a Saxon one, that almost every Saxon one occupies the site of a Romano-British church, and that every such church took the place of a heathen temple. That this was the case at East Shefford there is little doubt, and the repairs recently carried out have disclosed evidences of a much higher antiquity than the date usually assigned to it. There remains in the church a Norman font of stone, which at some time or other has been displaced, and fixed on a bed of brickwork. It was originally supported on a round pillar or stem in the middle with a small shaft at each of the corners. The central stem, which is perforated to act as a drain from the bowl of the font, has been discovered in the church. By a constitution of Edmund, Archbishop of Canterbury (A.D. 1226), fonts were required to be covered and locked when not in use, to prevent people obtaining the holy water for improper or superstitious uses, such as those of sorcery, and the supposed healing of diseases ("Fontes baptismales sub serâ clausi teneantur propter sortilegia." Lyndwood's "Provinciale," p. 247). On the font at East Shefford the remains of the hinges and staple to fasten the cover may still be seen.

A very interesting memorial, intimately connected with the consecration or reconsecration of the church has been brought to light in cleaning off the many coats of whitewash, viz., a consecration cross, incised into the stonework of the north pier of the chancel arch. The form is that known as the cross *pommée*, 3 inches by 2 inches in size. An important part of

the ceremony of consecrating a church, as it was practised before the Reformation, consisted in crosses such as these being marked upon the walls by the officiating Bishop with oil of chrism, at twenty-four different places, distributed equally throughout the building; that is, three crosses on the north, south, east and west walls respectively, both inside and out. It was the custom, both in England and on the Continent, to mark beforehand the places where the Bishop was to anoint the walls with chrism. This was done by crosses of various shapes and sizes being carved in stone, or modelled in plaster, or painted (generally in red), or lastly by metal crosses affixed to the walls. In some cases two of these methods were employed in the same cross. In churches that are built of rubble stonework with ashlar dressings, as is the case at East Shefford, the crosses are often to be found on buttresses, angle-stones and door jambs; places selected on account of the smooth dressed stone affording a better surface for painting or carving. In most cases, however, rough walling in Mediæval churches, whether inside or outside, was covered with stucco. Modern "restorers" generally cut this away, under the notion that bare stone walls are Mediæval, and many consecration crosses have been destroyed in this manner. There also remains on one of the quoin-stones of the aisle on the south side of the church what, most probably, was intended for a consecration mark, though it is not a cross. This kind of figure occurs so often in positions where we would expect to find a consecration cross, that it seems evident it was meant for one.

The exterior work done includes a sunk channel gutter round the church, lined with blue Stourbridge bricks, to carry off the water from the roof and walls, and thus keep the foundations dry; making good the defective tiling of the roof; new eaves and guttering; repair of walls of church and churchyard, and of the bell turret, with regilding and reparation of the weathercock, fixing wire lattice-frames over windows and door of chancel, to admit of their being left open for ventilation without the monuments being exposed to injury, and general attention where required.

In the interior the magnificent fifteenth-century alabaster altar-tomb, with recumbent effigies representing Sir Thomas Fettiplace and his wife, Lady Beatrix, who had previously been the wife of Gilbert Lord Talbot, has been most carefully repaired, and is now the great feature in the interior of the church. No inscription or coat-of-arms are to be found on this tomb, but it is supposed that a narrow fillet of brass, which bore the legend, has at some time been abstracted, or removed from round the verge of the slab bearing the recumbent figures. But it is worthy of remark that at this period monumental effigies of wealthy persons were frequently covered with a slight open frame of wood, brass, or iron, richly gilt, and furnished with lights, called a *herse*. It somewhat resembled the wooden ribs of a waggon cover, and was intended to support the pall, or herse-cloth. An example still remains in the Beauchamp Chapel, Warwick. Such a canopy as this may have been placed over the monument at Shefford, and fixed on the place where we usually expect to find the inscribed band on these altar-tombs. As some slight confirmation of this theory, a small piece of this plate, of latten, or brass, was found in repairing the monument, and, further, the letter "M" in Lombardic character of a never-completed legend has been detected in the hollow of the cornice, on the south side of the monument.

The very fine Purbeck marble tomb to John Fettiplace and Dorothy his wife (1524), on the north side of the chancel, has also received careful attention. There is no doubt, judging from the special features noticeable in its construction, that this tomb was used for the Easter Sepulchre. In the wish to be buried at some particular spot on the chancel's northern side, and in those injunctions for the architectural adornments of the grave to be so fashioned that "there might always be set the Easter Sepulchre upon the tomb," we meet with another proof of that eagerness in bygone times to be prayed for when dead which was felt by him who could have his wish fulfilled in the matter. While doing this, the owner of the soil, or the lord of the manor, sought to avail himself of those opportunities for getting his soul best remembered, which were afforded by the solemn and impressive Easter ceremonies of the ancient ritual, which once in every year were sure to bring all the people in crowds to the parish church. This highly interesting tomb is 8 feet high and 5 feet 9 inches wide, constructed so as to form a recessed altar-table, with a groined canopy, of the most elaborate and costly workmanship, the sides being filled in with rich tracery, surmounted by an enriched trefoiled entablature. Such a work as this represents a long period of patient labour, and the various architectural members are characterised by an elaborate richness, combined with the most elegant lightness. Few churches possess two more interesting monuments, which, by trouble and care, have in great measure been restored to their original beauty.

The floor of the chancel aisle has been raised to one uniform level, and the nave repaved on a bed of concrete, the ancient



encaustic tiles being relaid in their original position as far as practicable. The walls of the nave, which were in a ruinous condition, have been thoroughly repaired, and a dado in cement carried round to a height of 5 feet. The stone coffin-lid of an early date, bearing a triple cross, has been placed on four brick piers on the south-west of the nave, just parallel to where it was found on the outside of the wall. Many other small repairs have been carried out, which it is unnecessary to particularise in detail. The whole of the unsightly arrangement of high wooden pews, with the formidable "three-decker," the materials of all of which were for the most part in a state of utter decay from dry rot, have been removed, and it is proposed to substitute for them eight neat open seats and a lectern, which are required for funerals, the church being still used for this purpose, being surrounded by the old and only churchyard in the parish. Several repairs and improvements, moreover, are needed in the churchyard itself to put it in good and decent order.

It remains for me to say that the structural repairs have been well executed by Mr. Wooldridge, of Hungerford, and the reparation of the monuments has been effectively carried out by Mr. Pound, of Speenhamland, with a due regard to the demands of a truly conservative and antiquarian sentiment.

### THE SURVEYORS' INSTITUTION.

At a meeting of the Fellows of the Surveyors' Institution resident in Lancashire and Cheshire, lately held in Manchester, the question of the formation of a provincial committee of the Institution for the two counties, on the basis of the scheme for the local organisation of members throughout the provinces, was considered. The Secretary of the Institution explained the constitution of the new committees and the objects the Council have in view in their formation. Mr. John Cross was elected chairman of the committee for the ensuing year, and it was resolved that the committee be designated "The Provincial Committee of the Surveyors' Institution for the Counties Palatine of Lancashire and Cheshire." The committee then proceeded to consider the arrangements for the preliminary examination for the admission of students to the Institution, to be held at Manchester under the auspices of the committee on January 22 and 23 next. Messrs. J. Holden, T. Silk Wilson, E. J. Bridgford, and T. A. Dickson were appointed moderators for the purpose.

### A LEANING STEEPLE AT COVENTRY.

THE following particulars concerning the steeple of St. Michael's Church have been published in the *Coventry Herald* by Mr. Andrews, one of the city councillors:—

In the year 1818 the upper 24 feet of the spire was taken down and rebuilt. The builders at that time must have known that the steeple was out of perpendicular, for they rebuilt the 24 feet exactly upright, so that previous to the present restoration there was a bend in the spire where the portion which had been rebuilt joined the old work. Yet it would appear that all knowledge of this had perished, for the discovery by the contractor at the commencement of the present restoration that the tower was not upright came upon us as a surprise. It will be recollected that when the discovery was made, I at once suggested that the steeple should be plumbed from the summit, so as to ascertain the total deviation from the perpendicular. A wire was suspended without delay, and an account of my observations was published in the local press about three years ago. Now that the work is approaching completion, and the steeple settled upon its new foundations, it seemed to me that fresh measures of the leaning should be made before the scaffolding was removed, in order to hand down to our successors an exact knowledge of the extent to which the steeple leans from the perpendicular. We, therefore, suspended a fine copper wire from the centre of the spire at the apex of the hollow, 267 feet above the floor of the church. A sixteen-pound iron weight was hung at the bottom of the wire, and suspended in a bucket of water in order to prevent it swaying with the wind. Measures were made by myself and the clerk of the works (Mr. Webster), with every precaution to avoid error, on two calm days in July. On one of these days the weathercocks indicated an E.S.E. wind (or *with* the leaning of the steeple), and on the other day a N.W. wind (or *against* the leaning of the steeple). A mean of the measures gives the following results:—

	Out of perpendicular.
Centre of lead floor at octagon . . . . .	23 inches.
Centre of steeple at 267 feet . . . . .	38½ "
Base of weathercock at 290 feet . . . . .	41½ "

In order to test these results I had the wire suspended from the centre of the lead floor in the octagon (132 feet from ground) to measure the leaning of the tower only, and sets of measures were taken upon several calm days both in July and also in the present month, and these were finally verified by the

city surveyor (Mr. Purnell). No sensible difference was found between these measures and those made when the full length of wire was used. St. Michael's steeple, therefore, is 3 feet 5½ inches out of perpendicular. It is proposed to place two marks upon the pavement inside the tower, one of which will be in the centre of the tower, and the other exactly under the weathercock. They will of course be 3 feet 5½ inches apart.

It does not, however, require any measuring to see that the steeple is not upright. The leaning is visible to the naked eye. From the far end of Grey Friars' Green, where the steeples of Christ Church and St. Michael's are nearly in a line, it is easily seen that St. Michael's leans to the left, whilst from Ford Street, near the City Mill, it is seen to lean to the right. The direction in which the steeple leans is 37 degrees N. of West, or towards the Free Library.

The lean of St. Michael's steeple as given by the *Herald* above is nearly identical with that of the Belfry in Bruges—a deflection from the perpendicular which is very perceptible from the northern points of the city.

### TESSERÆ.

#### Building Accounts of Westminster Abbey.

SIR G. G. SCOTT.

AS Westminster Abbey is about the earliest work of its style in this country, and as the building of the first portion of it by Henry III. extended over a space of twenty-four years, *i.e.* from 1245 to 1269, it becomes important to ascertain how early in this period the style of its architecture can be proved to have been defined. Now a single entry in the fabric rolls has for ever settled this point. I have before stated that the most advanced part of the work as to style is the chapter-house, as that contained traceried windows of four and five lights in a very developed form; the tracery is not confined to circles, but containing great quatrefoils, and the heads of the lights being trefoiled, which is not the case in the church. Now it would be most useful to know the exact date of these windows, for though Matthew Paris gives 1250 as the year of commencement of the chapter-house, it may have spread over an indefinite length of time, and the windows have belonged to twenty years after that date. Let us look then to the bills. Here we find, in a roll bearing date 37th Henry III., or 1253, and expressly called the eighth year from the beginning of the work, an item of "300 yards of canvass for the windows of the chapter-house," followed immediately by items for the purchase of glass, showing that the windows in question were completed in 1253, which I see was the year before the king, in company with St. Louis visited the Sainte-Chapelle at Paris, which was then scarcely completed, and the style of which indicates exactly the same degree of advancement. I find also that during the same year the beautiful entrance or vestibule to the chapter-house was erected. The church itself was by this time—indeed, as early as 1249—in a state of rapid progression, so that the architecture must, in the main, have been quite settled from the time of its commencement. The entries are, for the most part, of a somewhat general character; but it is stated in the Pipe Rolls that further particulars have been sent in to the Treasury. These bills of particulars have it is feared been for the most part lost, but Mr. Burtt has succeeded in finding one complete one for about half a year (probably 1253), which is a perfect bill of quantities of the work done during twenty-five weeks, giving the names and measurements of every moulding and every detail of the work. It forms a very curious and interesting illustration of the architectural nomenclature of the period. Attached to it are two amusing little letters from the quarry master at Purbeck, promising shiploads of marble, and begging for speedy orders on the ground of other pressing business. The notices I have adverted to in the fabric rolls of the works, from Edward III.'s time onwards, are also very detailed, and give curious particulars as to the mode of employing men at that time. They appear to have been fed and clothed by the employer, and the clothing would appear to be by no means to be complained of. In one year we have an entry of 15s. (equal to 8s. or 10s.) for a fur robe for the chief mason; but another year nothing is entered for his robe, because this independent gentleman "refused to receive it on account of the delay in its delivery." Going back to the earlier accounts, I may mention that extensive works appear to have been going on at the same time in the palace and its chapel, including a great deal of decorative painting; also that the belfry of the abbey was being built, which I think stood somewhere westward of the church, and of which I believe that some remains existed at a somewhat recent date. The outlay upon the abbey during the first fifteen years of the work would, if translated into our money value, considerably exceed half a million.

#### Finger-Rings in Antiquity.

S. SMIRKE, R.A.

The love of ornament which distinguishes all Eastern nations at the present day seems to have equally prevailed



among the ancient Assyrians, of whom representations are for the first time brought before us in the remains discovered by Layard. Very few female figures occur, but scarcely a male figure is represented, whether priest or warrior, without large earrings, and most of them have necklaces, bracelets and armlets. It is to be remarked, however, that not a single case occurs, amidst all this display of personal jewellery, of a finger-ring; the entire absence of this ornament in sculpture, wherein details of this nature are so elaborately and carefully attended to, leads to the unavoidable conclusion that the finger-ring was an ornament unknown to the Assyrians. I am not about to digress into any question of the antiquity of finger-rings, an inquiry for which I am not competent. I will only take occasion to say that much of learned disquisition as there has been on this subject, the question remains to be answered. I think there has been much confusion produced by the vague use of the word ring, and the too ready assumption that when rings are named, finger-rings are intended. Signet-rings may have been, and were, worn suspended from the neck or attached to a chain. There are in the Book of Esther and in Jeremiah very clear allusions to finger-rings, but the earliest Classical authority that I am at present aware of is Pausanias, who says that he saw on the walls of a temple at Delphi a painting by Polygnotus of Phocis, represented with a ring on his left hand. Polygnotus flourished about 422 years before Christ. It is, however, very remarkable, if it be true, that there is no example known of a Greek statue with a ring on the hand.

#### Mediæval Tie-Beams.

R. BRANDON.

In the churches of the Middle Ages a perfectly horizontal tie-beam is of extremely rare occurrence. Where a tie-beam is used, we almost invariably find it cambered, as are also the collar-beams; even the hammer-beams will be generally found, on close inspection, to incline upwards from the walls. The disagreeable effect of a straight tie-beam was often further counteracted by having curved braces framed from its underside, connecting it with the wall-pieces, thus forming an arched support for it, as at Outwell Church, Norfolk. In roofs of higher pitch the builders still endeavoured, with varied success as to effect, to retain the arched shape in conjunction with the tie-beams. A curious specimen exists at the church of St. Mary the Virgin, Pulham, Norfolk, where the beam literally divides the arch in two. As the Perpendicular period drew towards a close, tie-beam roofs of very low pitch were of general occurrence; in fact, they were frequently almost flat, with no more rise to throw off the wet than could be obtained by the camber of the beams. These roofs were oftentimes profusely ornamented, as in that over the north chapel of Wellingborough Church, Northamptonshire. In this instance, the eastern bay, as was very frequently the case, is panelled, while the others are left open to the rafters.

#### Leon Baptiste Alberti.

C. R. COCKERELL.

When searching for manuscripts in 1416, Poggio Bracciolini discovered a copy of Vitruvius, "covered with dust and rubbish, in a tower not fit to receive a malefactor," he says, "at the monastery of St. Gall, at Constance." Copies of this happy revelation were spread amongst the learned until the invention of printing, in 1445, multiplied them amongst the great architects of the day—Brunelleschi, Cæsariano, Bramante, and others. The magnificent Alberti was one of the chief of these, but not finding in Vitruvius sufficient to inform and fire the student's mind, he composed that work which all competent judges have esteemed the most masterly compilation in the art extant. "Seeing," he says (lib. vi.), "that of all antiquity Vitruvius alone has reached us, that such chasms and imperfections appear in his work, that his help is insufficient: his language, too—Greek to the Romans, and Latin to the Greeks—leaves so much unintelligible, I thought it the duty of an honest and a studious mind to free this science from ruin; though the rehearsing without meanness, reducing to a just method, writing in an accurate style, and explaining perspicuously so many various matters—so unequal, so dispersed, and so remote from the common use and knowledge of mankind—certainly required a greater genius and learning than I can pretend to," &c. But he did not confine himself to the theory of his art. As a scholar, a mathematician, a Platonist, and of a noble family, he associated with all the greatest spirits of his day, and was intimate with the living masters and the progress of their works. Whatever comes from him, therefore, is generous, moral, philosophical, practical, and elevating: he proves himself truly of the order of cavaliers; he mounts you upon his horse, which quickly you find a Pegasus; he raises you above the vulgar cares and labours of this nether world, and in his airy flight he shows you all the kingdoms of the world and their handiworks; and then he sets you down, cheered, instructed, delighted, and exulting in your profession. The only English edition is that of Leoni, 1755. The spirit of that day deemed art a primary instrument of civilisation; it became

the least and the occupation of the little courts of the rival states of Italy; literary societies, discussions, and conversations, discovered and refined upon the true principles of poetry and of fine arts; and a Bembo, Sadolet, Annibal Caro, Castiglione, Aretino, and a host of literary stars, all contributed their zeal and means to the æsthetical intelligence of artists. Architecture became the field of poetical imagination: and we have the *Υπνοτερομαχία*, "The sufferings of love in a dream," by the learned friar, Colonna, in which the wonders and delights of the art, and of its theories (full of original and beautiful conception, the source from whence the artists of the day drew continually), are accompanied with the romantic and amorous adventures of blighted love, of which the author was the victim.

#### The Sculpture of Wells Cathedral.

R. WESTMACOTT.

The sculpture which decorates Wells Cathedral is, of course, very rude in point of art; but it is of great interest, from the character of the designs, and from the date of its execution. It illustrates various subjects of scripture, history and acts in the life of our Saviour, besides recording, in statues of heroic size, the memory of saints, kings, queens, and others who were probably patrons and benefactors of the Church. Another circumstance of interest is that it seems to be the earliest example in this country of such sculptural enrichment exhibiting a connected series of scripture illustrations; but its importance may be still greater if, as has been conjectured, it is the first specimen of the kind known to exist in Western Europe. Its origin, then, becomes a question of some importance. It is not improbable that some of the earliest Italian practitioners may, in their wanderings, have penetrated as far as England; but the style of the sculpture certainly does not resemble that of the Italian artists who undoubtedly were employed on the tombs of Edward the Confessor and of Henry III., and, therefore, it is not so easily associated with the art derived from that source. Flaxman, admitting this, was disposed to think it was derived from the East, conceiving that, as it was not Italian, it might have been founded on examples seen by the Crusaders, a speculation which has little probability to recommend it. That the Crusaders influenced the civilisation of Europe must be conceded, inasmuch as many of the ingenious Eastern arts became known and were introduced by those who returned from those wars; but it scarcely can be likely that any light could be thrown on sculpture by the practice of the Eastern nations. No writer seems to have allowed himself to think it possible that the English could have been capable at any period of their history of producing such art as was required for the decoration of their sacred and other edifices, even of the rude and primitive kind under consideration, and therefore all have taxed their ingenuity and invention to give the honour of it, such as it is, to any rather than their own countrymen. The preponderance of the foreign element in the Courts of the sovereigns of England, and the little knowledge of, or feeling for, art in the higher classes, have always tended to depress or ignore the attempts of native artists to do at home that which the artists of Italy, France, and Germany effected for the credit of their respective countries; and on all occasions, till a comparatively late period, foreign painters and sculptors were preferred and employed. Want of opportunity and want of practice, all-sufficient causes in themselves of inferiority, were assumed too often by those but little competent to judge to be proofs of national incapacity; and till Christopher Wren vindicated the honour of his country in architecture it seemed never to have occurred that an Englishman could make himself worthy to take the position of a real artist.

#### Flexure of Wrought-iron Plates.

E. CLARK.

If we take a wrought-iron plate of considerable length in proportion to its thickness, or use it as a pillar lengthwise, and imagine its dimension varied, we have to inquire what corresponding variation will take place in its resistance to flexure. We can only make it wider, longer, or thicker, and we will separately consider each such variation. First, if we make it wider its resistance to flexure will evidently be proportionate directly to its width. If we make it, for instance, twice as wide, each half exerts the same resistance to flexure, whether they are separated or united; and consequently, doubling the width is merely doubling the amount of material to be curved, or doubling the strength. Secondly, if we make it longer, it will follow from the laws of pillars that its strength will be inversely proportionate to the square of its length; for the strength of a pillar varies inversely as the square of its length. The plate may be considered as a number of square pillars placed side by side, the deflection being merely confined in direction by their junction, but the resistance of each pillar to flexure remaining unaltered, and consequently the resistance of the whole. Thus an inch plate, 12 inches broad and 12 feet long, is evidently the same thing as regards its bending under these circumstances as twelve separate pillars each 1 inch square and 12 feet long, placed side by side and bending in a similar direction.



## NOTES AND COMMENTS.

THE forthcoming session of the Architectural Association will be opened on Friday evening, October 5, by a *conversazione* at the Westminster Town Hall. The first ordinary meeting will be held on the 19th prox., when the president, Mr. H. D. APPLETON, F.R.I.B.A., will deliver the inaugural address. A good programme of lectures has been arranged, which will be delivered at the usual fortnightly meetings, as follows:—"Elizabeth and Victoria," by Mr. J. A. GOTCH; "Arches and Vaulting," by Mr. A. T. WALMSLEY; "The Development of Irish Architecture from the Early Celtic Work to the Eighteenth Century," by Mr. J. L. ROBINSON, A.R.H.A.; "Symbolism," by Mr. DOUBLEDAY; "London Street Architecture as it is and as it might be," by Mr. FRANCIS MASEY; "The Architecture of Support and the Architecture of Equipoise," by Mr. E. RADFORD; "Artificial Illumination," by Mr. J. SLATER, B.A.; "The English Classic Revival of the Seventeenth and Eighteenth Centuries," by Mr. J. M. BRYDON; "The Life of an Old Parish Church," by Mr. J. T. MICKLETHWAITE, F.S.A.; "Architecture in Oxfordshire," by Mr. W. A. PITE; "Sussex and its Architecture," by Mr. LACY W. RIDGE; "Wrought-iron Door Furniture—Ecclesiastical," by Mr. J. STARKIE GARDNER; and "The Travelling Student's Notes," by Mr. D. J. BLOW.

MDLLE. ROSA BONHEUR does not lose courage with the advance of years. The painter, who made a name in England by her *Horse Fair*, as time runs on appears to seek more ferocious animals than horses and cows. Mdlle. BONHEUR recently requested permission to paint in the menagerie of M. HAGENBECK, the JAMRACH of Hamburg, but that gentleman courteously offered to send some of his specimens to the artist's studio, with a keeper to insure safety. Mdlle. BONHEUR selected three panthers to start with, and when they serve their turn as models M. HAGENBECK will supply any others which may be desired.

WE give this week some extracts from the Guide to the British Museum published this year, and these should show that visitors to our great national collection of antiquities will find therein all the information they can desire concerning the objects exhibited for their instruction. But to derive practical benefit, such a guide should be read at leisure prior to a visit or visits to the museum in a preparation for study of the collections *seriatim*. The compilers of the guide have done their part ably, and have given more information and have expended more time and labour on the compilation than is usual in such publications. Guides are chiefly valuable for library use. Few would wish to see the British Museum, or any of our other museums, turned into lecture-halls. The lecturer is, as a rule, out of place in a museum, where the visitor or student should be allowed to see its contents for himself, and in quiet. He can think over the subject, or, if need be, refresh his memory from such a guide-book, or from his own notes, or, indeed, as in the case of some museums, a brief question would elicit from the attendant a reply, both courteous and to the point, about any particular object under his care. This is a different thing entirely to the typical beef-eaters or to lecturers discoursing to an admiring following of rustics and 'Arries. That such attendants as those we have in mind are to be found is proved by the fact that they exist in the great museum at Naples. All who have visited that noble collection will remember what a fund of information the custodians of the various galleries there were able to impart when such service was asked of them, and of how useful a character it was.

FRANCE was never more eager to erect memorials of her worthies than in the present time. Scarcely a month passes without an announcement of a project for a work of that class. The latest comes from the literary and artistic society of the department of Lot, and has for its object the erection of a memorial of CLÉMENT MAROT, the poet, who was born in Cahors in 1495. His life was one of vicissitude. He was brought up as a page in the French court. After the battle of Pavia, he shared the imprisonment of FRANCIS I. On returning to France his heretical opinions

brought him to a dungeon in the Châtelet. Finally he died of want in Turin. MAROT, in the sixteenth century, was the representative of that *bon sens* which is supposed to be the characteristic of French literature, and from his wit he was competent to hold the office of court jester. BOILEAU recognises his "elegant badinage," but it is not to be expected that people will care to give much study to his works, and accordingly there is more need for something to keep his memory from oblivion. The designs for the memorial are the work of MM. CALMEN and RADALOSSE. The structure is to be Renaissance in style, and will be placed on a site near the street in Cahors which bears the name of the poet.

THE Corporation of Nottingham have just presented to Mr. FELIX JOSEPH a beautifully illuminated address of thanks, enclosed in an elaborately carved oak album. This presentation was made through Mr. Alderman RENALS, J.P., chairman of the Castle Museum and Art Gallery Committee, as an expression of their gratitude for the loan of his splendid collection of old Wedgwood ware, and for the many rare and valuable gifts made to this institution since its opening in 1878 by the Prince and Princess of WALES. The entire work, which is an excellent example of local talent, was carried out under the personal supervision of Mr. GEORGE HARRY WALLIS, F.S.A., the curator of the museum, the carving being done by Mr. MIDDLEBROOK, and the illumination by Mr. ARTHUR MARSHALL, A.R.I.B.A.

It must be regretted that obstacles should be put in the way of the project of the committee who have been willing to expend trouble and time, in addition to money, for the purpose of preserving Kirkstall Abbey for the country as well as for the district. The honorary secretary of the committee, Mr. GEORGE HILL, however, now shows that difficulties have arisen. After stating that negotiations had been opened for the purchase of the estate, and that one of the members of the committee had engaged to advance the necessary money if terms of purchase could be agreed upon, he added that the committee was anxious that the abbey and grounds should not fall into the hands of speculators for any purpose, and had determined to take upon itself the entire risk of not being able to effect a transfer of the estate to the town of Leeds, or to some other disinterested trust. With these objects in view, the committee made a formal offer to purchase the abbey and grounds, on terms, conditions, and restrictions suggested by the vendors. In reply the committee has now been informed, on behalf of Lady CARDIGAN, that its "offer cannot be entertained, but that the abbey will shortly be offered by auction." In conclusion he says the committee regrets that Lady CARDIGAN has determined to submit what her ladyship recently described in the press as "the ruins of her grand old abbey" to the risks of a public auction.

THE latest instance of the *entente cordiale* between Russia and France is rather odd in form, being neither more nor less than a paving-block. The officer who has charge of the finance of the Russian section for the International Exhibition, and who is also one of the Emperor's councillors, has sent a sample of the kind to Paris, and it is in consequence received with as much interest as if it were a diplomatic communication from the Russian Foreign Office. The block appears to correspond with one of the numerous substitutes for stone with which we are familiar in this country. It is said to be made up of powdered granite. Similar blocks were laid in the space around the cathedral of St. Isaac, in St. Petersburg, eighteen years ago, and have withstood all the traffic. It is also claimed that the paving is as noiseless under carriages as wood pavement. The Russian block is interpreted to be a token of sympathy by the Parisians, but business, not sentiment, is what is really sought. It is proposed that the Russian pavement should be tested near the Opera House, and if it should succeed there to be afterwards employed in the streets of the city. With all their enthusiasm for their new ally we can hardly believe that the Municipality would go so far to discover a material for pavement. Much cheaper blocks are obtainable in places nearer Paris than is St. Petersburg.









J. Phéné Spiers.

"INK-PHOTO" SPRAGUE & CO. 22, MARTIN LANE, CANNON ST. LONDON, E.C.

MOSQUE OF IBN TULOON, CAIRO.

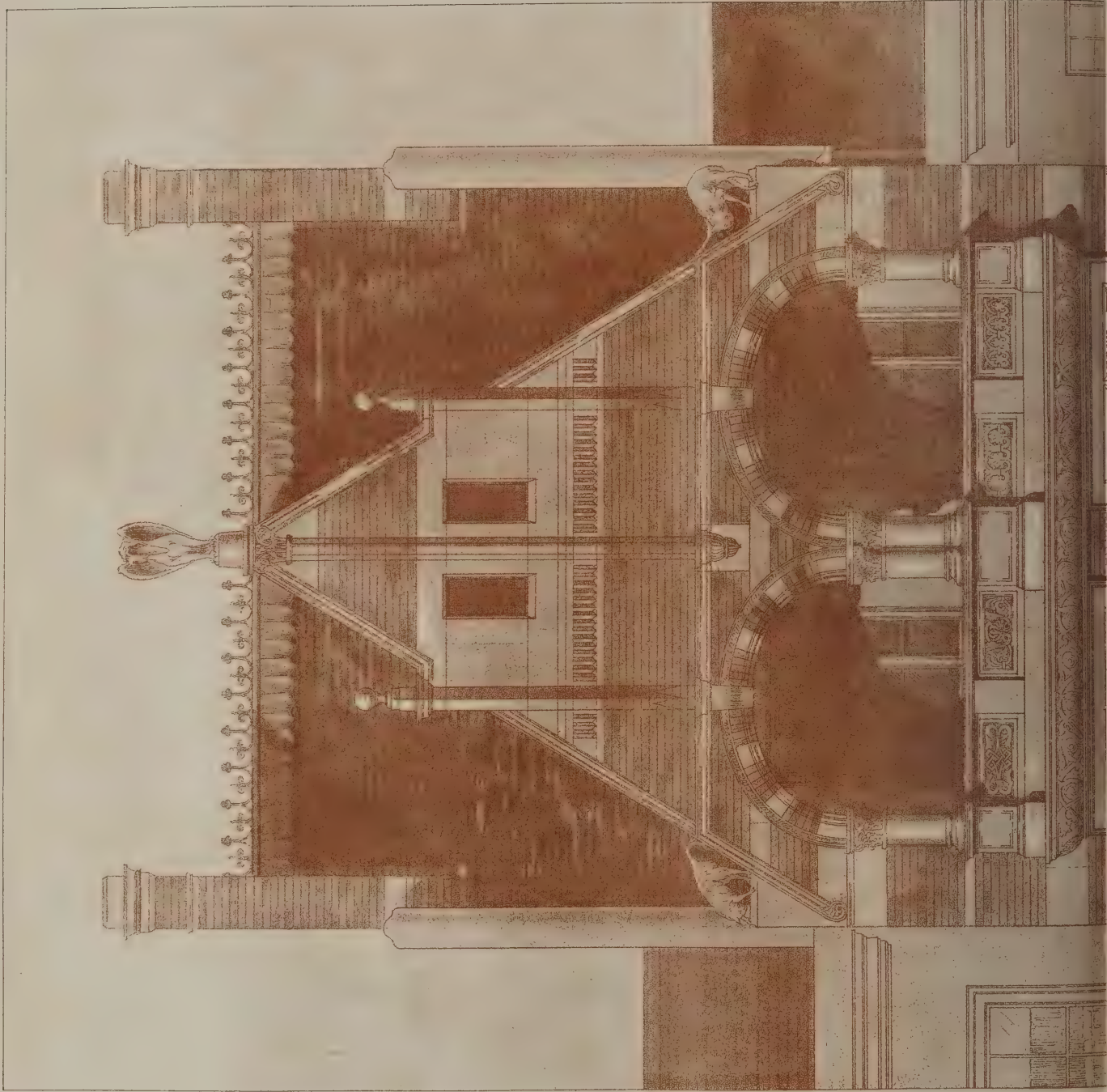
Drawn by R. PHÉNÉ SPIERS



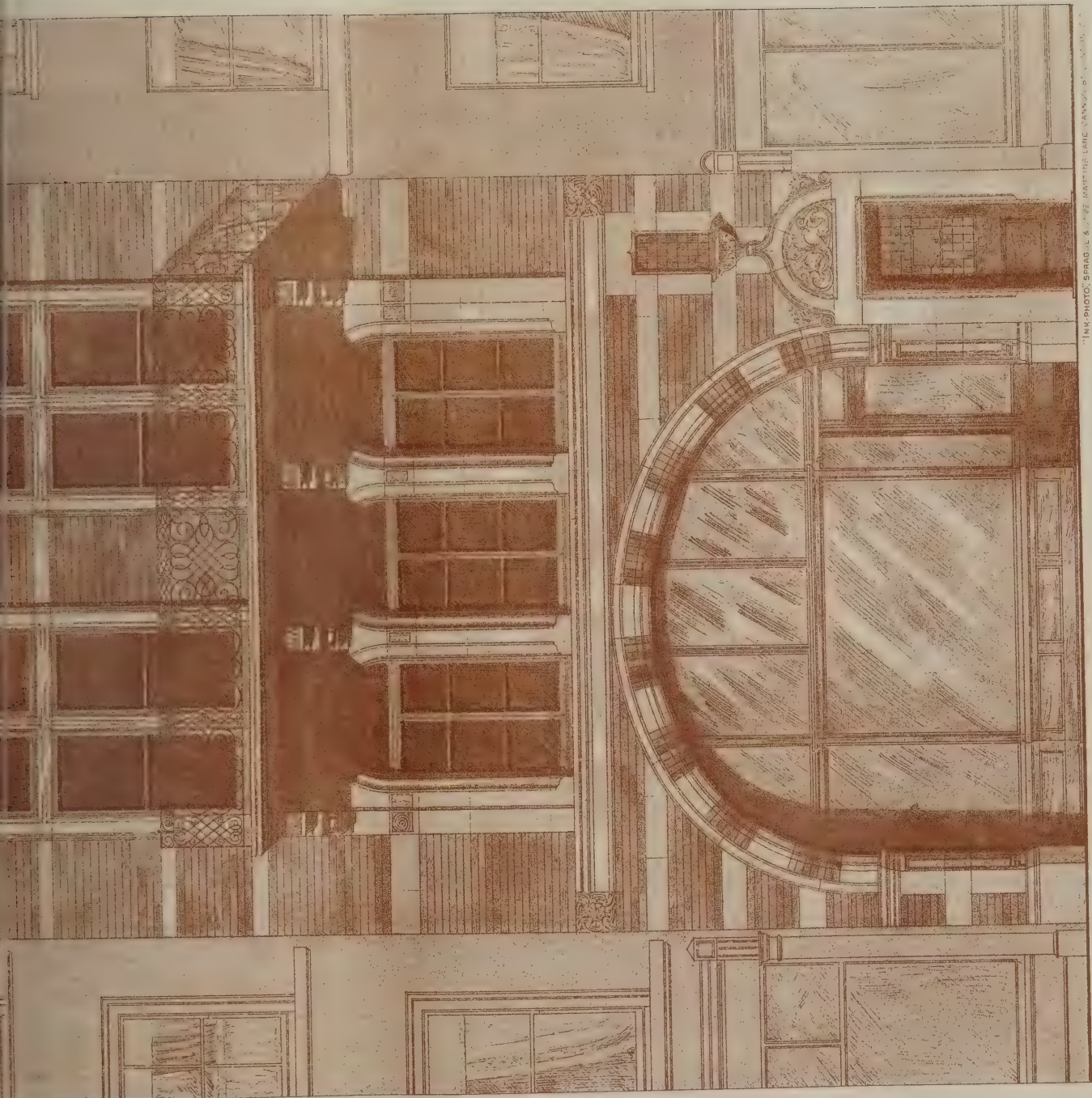




The Architect, Sept. 28<sup>th</sup> 1888.







BUSINESS PREMISES, GOLD STREET, NORTHAMPTON.

Albert D. Smith, Architect







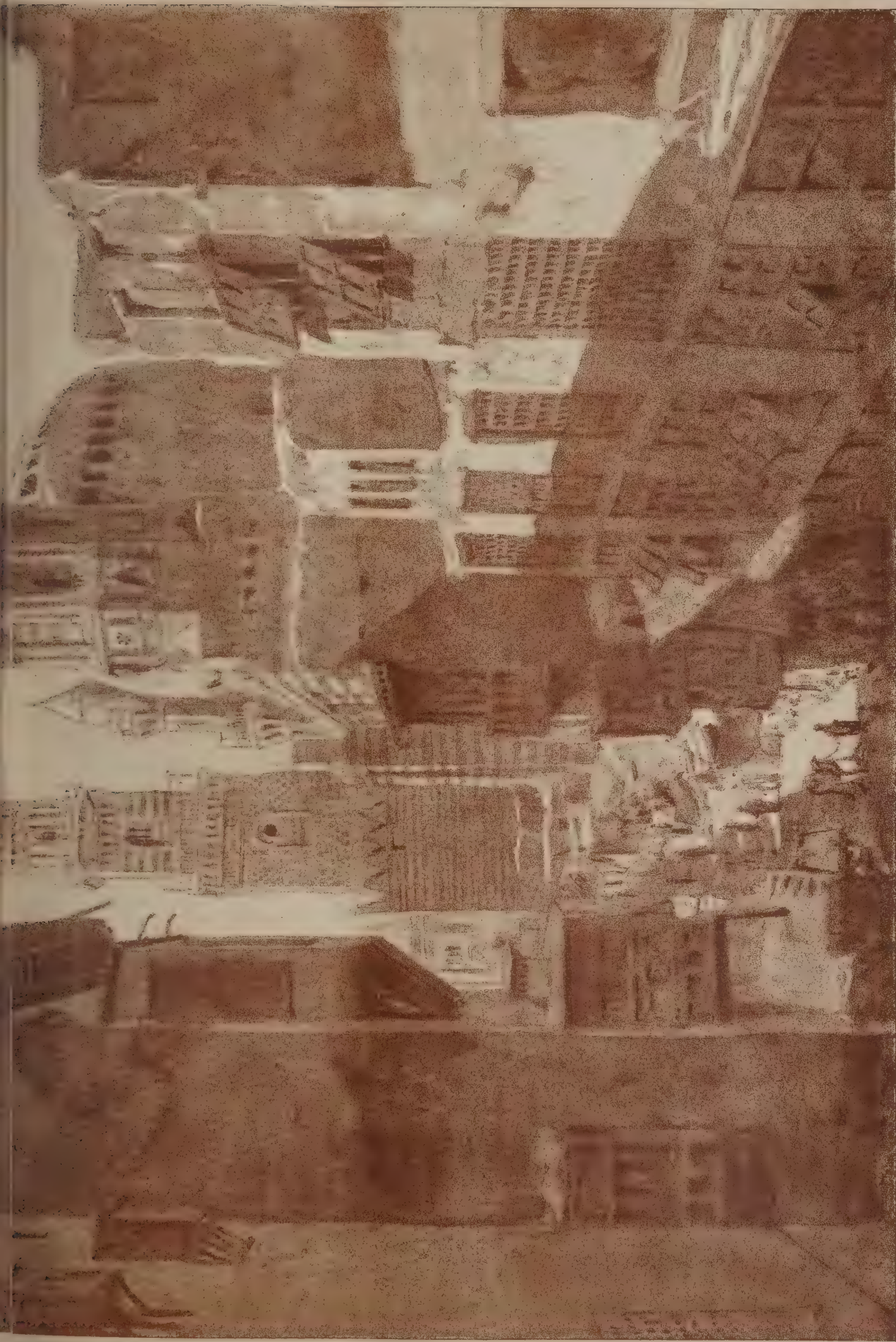




The Architect, Sept 28<sup>th</sup> 1888.







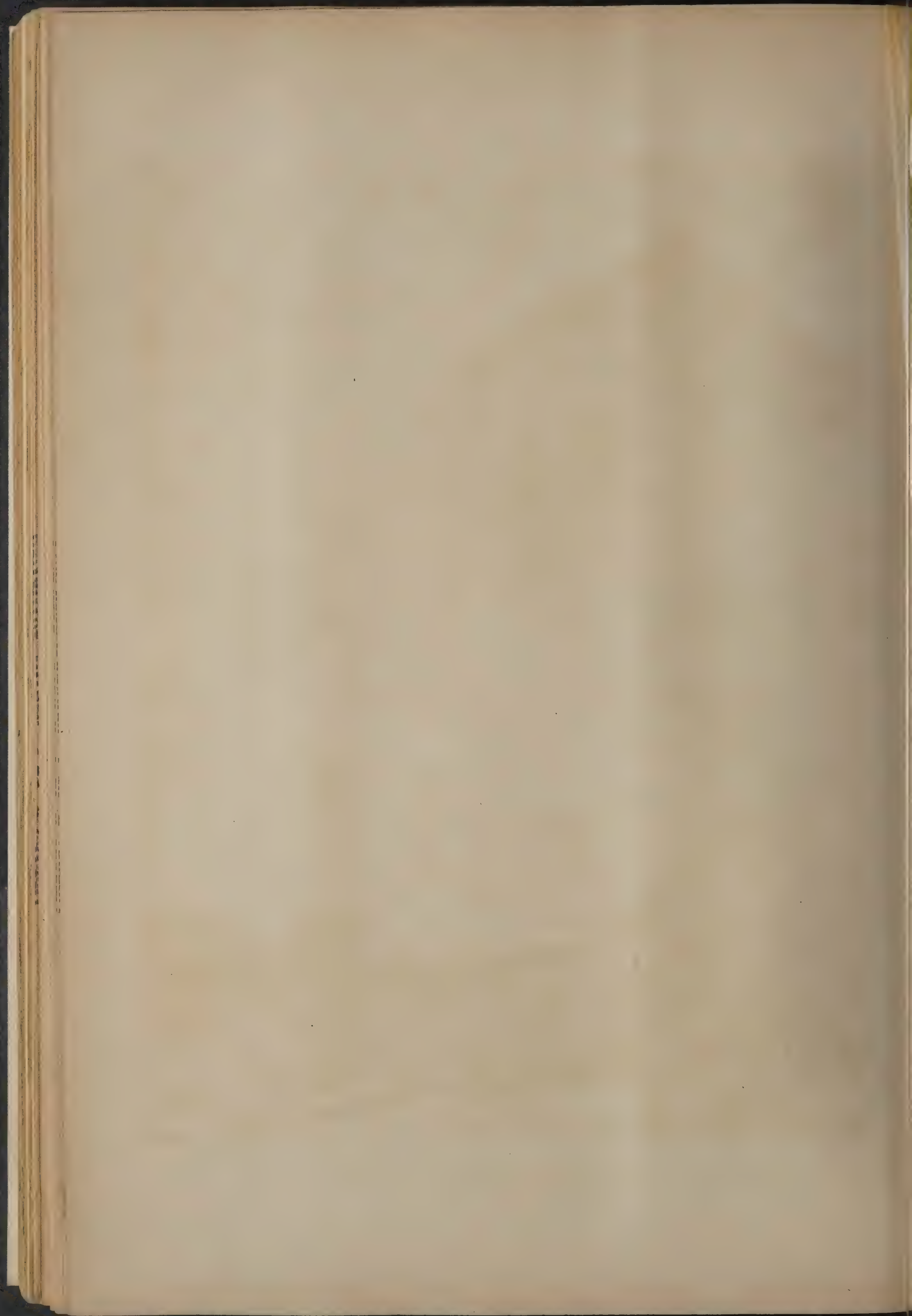
"INK- PHOTO" SPRAGUE & CO. 22, MARTIN LANE LONDON, E. C.

R. Phené Spiers

# STREET IN CAIRO. MOSQUES OF KALAOON, EL NASR, AND BERKOOK.

Drawn by R. PHENÉ SPIERS.







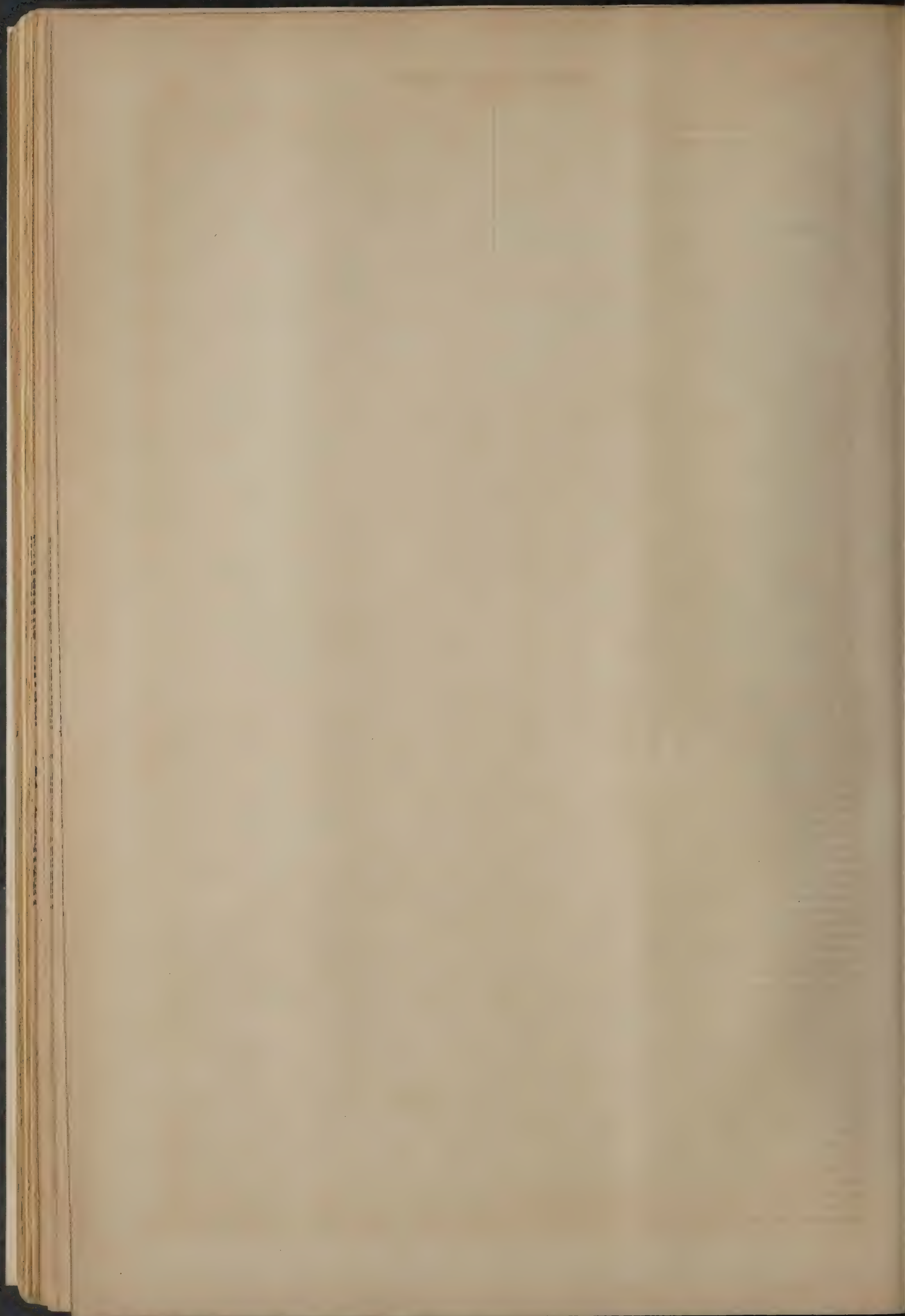


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SILK MERCERS' BAZAAR, CAIRO.

Drawn by R. PHENÉ SPIERS.







## ILLUSTRATIONS.

BUSINESS PREMISES, NORTHAMPTON.

THIS illustration of a building, by Mr. A. D. SMITH, of Westminster, is taken from a drawing that was exhibited this year in the Royal Academy.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.NO. 24.—STREET IN CAIRO. MOSQUES OF KALAOON, EL NASR,  
AND BERKOOK. [R. PHENE SPIERS.]

NO. 25.—MOSQUE OF IBN TOOLOON, CAIRO. [R. PHENE SPIERS.]

NO. 26.—SILK MERCHANTS' BAZAAR, CAIRO. [R. PHENE SPIERS.]

## EXCAVATIONS IN CYPRUS.

THE work of the Cyprus Exploration Fund, carried on by members of the British School at Athens during the past winter and spring, has been more than once referred to in these columns. We are now in a position, the *Times* says, to present our readers with a more detailed record, based upon the reports of Mr. Ernest Gardner, the director, and of Mr. R. Elsey Smith, the architect of the expedition.

A preliminary tour of exploration was made in December by Mr. Gardner and Dr. F. H. H. Guillemard, who visited the ancient sites of Cerynia, Lapithus, Soli, an early Phœnician temple on the Limniti river, Polités Chrysokhon (probably Arsinoë), and new and old Paphos. On a later occasion Mr. Gardner also visited Amathus and Curium. Various circumstances delayed active operations until February, when Mr. M. R. James conducted the excavation of a hill called Leontari, near Nicosia, containing traces of early houses and walls, deep cuttings in the rock, a massive fort, and archaic tombs. No decisive evidence was forthcoming as to the date of the massive walls of the fortress, which are attributed by some competent authorities to Roman times, but are more probably Mediæval. The top of the hill, however, was occupied on the north by a network of primitive walls, mixed with early pottery and other objects pointing to a remote period, and by an early wall of fortification, replaced in later times by the massive one still extant. On the south of the hill lay tombs of an equally archaic period, which yielded about two hundred vases and other objects in bronze, lead, and silver. The rock of Leontari is a remarkable elevated tableland of sandstone formation, rising 130 feet above the surrounding plain, and 520 feet above the sea-level; it has a steep cliff at the top running all round the hill, which renders access difficult. The hill, having a circumference of nearly a mile, offers too long a line of defence for the men who could find refuge on it; advantage has, therefore, been taken of a narrow neck of land, which divides the hill into two unequal portions, to form an inner citadel of the smaller northern half. It is here that all the traces of building were found; the tombs all lie beyond the wall on the southern half of the hill. This arrangement recalls the general plan of the fortress of Tiryns, but at Leontari the inner citadel itself has a circumference of almost the same length as the whole fortress of Tiryns. Relying for the most part on the natural slopes of the hill for defence, the inhabitants only raised a wall across the isthmus at one exposed point. This wall, like all those in the northern hill, was built of small, unhewn stones, laid without mortar and carefully fitted. Nowhere, however, is there more than a single course flush with the ground. The wall was 6 feet broad, and had a large tower 60 feet square at its west end, and possibly another at the east. A few feet south of this wall are extensive remains of a far more massive structure, consisting, likewise, of two great towers and a curtain wall. The west tower, which is the most perfect, consists of a single chamber 32 feet by 57 feet, with walls 16 feet thick. The curtain wall is 10 feet thick. The inner lining of the towers consists of good ashlar work, while the outer facing of the walls, above a plain base, consists of very fine rusticated work, *i.e.* blocks having a raised centre panel with a broad chisel draught all round. The core is entirely of stone, set in a hard white mortar, and laid in courses about 2 feet high, containing here and there stones of the full height of the course, but mostly built of smaller stones. To sum up, we seem to have in Leontari Vouno traces of a very early settlement, as evidenced by the tombs, to which we may refer the slighter early walls, while the more massive walls belong to a later occupation, probably in Mediæval times.

The principal work of the season, however, has been the excavation of the great Temple of Aphrodite at Old Paphos. As one of the two or three great centres of worship in the ancient world, this site seemed almost certain to yield important results. It has never been excavated, although such an authority as the Central Archæological Institute at Berlin had

long held its excavation to be most desirable. Digging was begun upon February 3, and carried on without intermission until May 5. The actual site of the temple having been ascertained by the cutting of deep trenches in various directions, the whole of the accumulated earth was gradually removed, so that not only was the plan left clearly visible, but the inscriptions and other antiquities scattered about could not fail to be discovered. First, as to the temple itself. It is known to have been of great antiquity and of Phœnician origin, and it was apparently but little altered by the Greeks when they became the ruling power in the island, for nowhere on the site were found traces of any building at all resembling the usual Greek temple. In Roman times it was twice damaged by earthquake—in the early part of the first century and towards the close of the second. Each time it was restored with great magnificence, but although the Romans made important alterations and additions they do not seem to have wished to change the main character of the building, or even to any great extent the arrangement of the various parts. Coins exist of Roman times giving a view of this temple, and showing a tall central chamber or cella, with lower chambers or porticoes on either side, and a court in front enclosed by a wall with gates. A coin of Byblos, a town on the Phœnician coast, shows a temple of very similar structure, with a large court surrounded by a wall containing the sacred cone, and entered on one side through a lofty portico. We have a tolerably full description of one building—Solomon's temple at Jerusalem—which may practically be considered a Phœnician temple, though no doubt modified by the circumstances of its construction. In the main there is a strong correspondence between the temple at Paphos and the account of Solomon's temple given in the Second Book of Kings. In both we get a series of large outer courts; in both a lofty central chamber of small dimensions, flanked by lower ones. A diagram has been prepared showing the general plan of the buildings. Walls of a date earlier than Roman are indicated by dark bands, while the Roman work is shown by cross hatching. In each case the dark shading indicates such walls or fragments as are actually laid bare or found *in situ*, the dotted lines those walls or portions of walls for which there seemed to be sufficient evidence to warrant them being shown on the plan. Every part of the site which could be examined at all has been explored down to the rock level. The temple stands on a considerable elevation above the sea on ground which slopes gently seawards for some distance, and then dips suddenly down about a mile from the coast. This elevated ground is bordered on the west by the deep ravine of the river Bocarus, and on the east by a gorge which contains a river bed, usually dry.

The plan falls into two main divisions:—(1) the south wing, standing detached; (2) a quadrilateral enclosure, containing various halls and chambers. (1) The south wing seems to have been the earliest portion of which any traces remain. It consists of a large hall or court, bounded on the west by a fine wall of massive blocks, standing on a basement of rough stones, with a carefully-prepared upper bed. Between this court and the great quadrangle are remains of some irregular chambers and some pier bases; it seems probable that these bases may have been part of a triple avenue leading to the court, so that if this were the original shrine we should have an arrangement similar to that on the Byblos coin. (2) The rest of the site is occupied by buildings of later construction than the south wing, and probably added as the temple gained in renown and wealth. Taking the various parts of these later buildings as they occur on the plan, and commencing from the south, we find stretching across the whole width of the site a great hall or stoa, with a row of columns down the centre. Though the construction is Roman, there is good ground for believing that the general character of earlier buildings is here, as elsewhere, retained; of such earlier and smaller chambers sufficient traces remain to allow of fairly accurate restoration. The stoa was probably roofed, and entered from the south by a projecting portico. Running round the walls inside is a broad platform 2 feet above the general floor level; from the low wall which supported this platform project a series of small corbels to carry a seat. The floor at the lower level consists of a geometrical mosaic, carefully laid in marble of delicate natural tints. This was probably the portion of the temple to which worshippers would be first admitted, and would thus answer to the outer court of Solomon's Temple. Under this mosaic floor were found several inscriptions, the marble head of Eros, and various fragments of bronze and terra-cotta. North of the stoa comes the central hall, also of Roman construction, and so arranged that its south side is formed by part of the north wall of the stoa, from which no doubt it was entered direct. This hall was probably covered by a roof, and had a double line of columns, as in the great stoa on the Acropolis at Athens between the two theatres. But the walls as they stand are very imperfect. Both this hall and the stoa were of the Doric order, and some architectural fragments were recovered. The hall is of much smaller dimensions than the stoa, and seems on the north side to have



opened into a great court without roof. Here, probably, and in the hall stood many of the dedicatory bronze statues of which the bases were found buried in a large pit. The whole of the space east of the hall and court was occupied by a series of chambers of considerably earlier date, with walls much more regularly built of carefully-prepared stones of moderate size, generally laid without mortar. Owing to the curious angle at which the Romans set the south stoa to the earlier buildings, the southernmost chamber is of an irregular form. The central chamber is the most perfect. All the walls are of early date, though the south wall has been partly rebuilt in Roman times. Remains of a late stone floor are interesting as giving the probable floor level. Under it, besides fragments of a Cypriote and other tablets, were found a very fine bronze gilt pin and a crystal cylinder belonging to a sceptre. In default of direct evidence as to the position of doorways, the difference of floor level shows that there can have been no access to this chamber on the north side. The main entrance was probably on the east. North of the central chamber is a broad passage or chamber, with no wall to east or west. This may have formed a great entrance for special occasions, and might thus be identified with the central feature represented on the Cypriote coins as giving a view from the open court. Two large bases for piers actually exist at the east end of the passage where piers occur on the coins. The west end was probably open. The chambers north and south correspond to the lower buildings on the coin with the courtyard extending in front of them. These chambers were probably connected with the administration of the temple, or formed residences for the priests. Finally, along the north side of the open court, and overlapping part of the chambers, is the north stoa, of smaller dimensions than the south stoa, and with no columns in it. The floor is of mosaic, but much coarser than that in the south stoa. The walls are partly Roman, partly of earlier date. Outside this stoa, which apparently formed the north boundary of the temple site, occur detached fragments of walls and small courts of Roman date, belonging, no doubt, to residences or offices for the priests or attendants of the temple.

A brief account must now be given of the antiquities discovered at Kuklia and elsewhere. On the site of the temple itself the most numerous and important finds were the inscriptions, amounting to about 150. Three or four, more or less fragmentary, were in the Cypriote Syllabary. Two marble tablets call for especial mention, one containing a letter from Antiochus to Ptolemy Alexander; the other the list of contributors to the Elaiochristion, doubtless a feast connected with the ceremony of anointing the sacred cone. Another tablet bears an elegiac inscription recording that at the suggestion of King Nikokles the town was fortified; Nikokles conspired with Antigonos against Ptolemy in B.C. 310. But by far the greatest number of inscriptions were on the pedestals of statues dedicated in the temple in Ptolemaic times. The titles, both of the corporate bodies that dedicated them and of the officials in whose honour they were set up, throw much light upon the constitution of Cyprus during that period. Many of these bodies seem to have been military colonies established in the island. The officials usually bear the title *συγγενής του βασιλέως*, with commonly the addition *στρατηγός*. The offices of admiral or high priest are sometimes associated with that of military governor. Several other officials of the Ptolemaic service are mentioned, e.g. *τροφεὺς βασιλέως*, *ἀρχισωματοφύλαξ*, an officer described as of the great library at Alexandria, and a mysterious official called the *ἀρχιδέσποτος*, of whom we hear nothing more. Other antiquities were hardly so numerous as might have been expected, but were still of considerable importance. Naturally, on this site, there were found several rude images of Aphrodite of primitive form, but not a large number of the Cypriote statues and statuettes which have occurred on other temple sites in Cyprus. On the other hand, there have been found some important examples of purely Greek work—a small marble head, of later archaic style, about the beginning of the fifth century; and, above all, a marble head of a boy, about life-size, which may, perhaps, be known in the future as the Eros of Paphos. This is of the finest Greek work and in perfect condition. Various heads and other fragments were found; but perhaps second in importance comes a very richly worked gold hairpin, the top of which is adorned with four goats' heads and above them four doves. The whole is a beautiful specimen of goldsmith's work. The bulk of the tombs examined in the neighbourhood of Paphos had been rifled in ancient times, and even what was left was later than the date of the tombs. The pottery found in the few tombs undisturbed could not be assigned to a remoter period than the seventh or eighth century B.C. With this, however, were sometimes found vases of unmistakable Mycenæ type, seeming to show that the very remote epoch commonly assigned to these vases is to some extent erroneous. In later tombs a considerable number of glass vessels was found, some of them remarkable for their shape or colouring. On the whole, however, Kuklia is not a tomb-site—probably because its ancient fame and wealth have in all periods attracted riflers

who have left but little for the gleaners of to-day. The chief result, then, of the first season's work of the Cyprus Exploration Fund has been the plan of the great Temple of Paphos, built according to Phœnician traditions, and so adding to our most scanty knowledge of the Phœnician temple, as famous in the ancient world and as often mentioned in literature as any known to or built by the Greeks. Since the completion of active work Mr. Hogarth has been engaged in a careful archaeological survey of the island, and his report will help to guide the committee in future operations. In the meantime a site has already been decided upon for next season's work, which is confidently expected to yield a rich harvest of antiquities. The treasurer of the fund (Mr. Walter Leaf, Old Change, E.C.) will be very glad to receive contributions towards the cost of this and future undertakings.

#### EDINBURGH FREE LIBRARY.

ON Monday evening a meeting of the General Committee of the Edinburgh Public Library was held, Lord Provost Clark presiding.

The report of the Building Committee, which was adopted, stated that, on the recommendation of the architect, it was resolved to substitute Carmyllie stone for granolithic for the south-east staircase leading from George IV. Bridge to the Cowgate public entrance; that estimates of the extra cost had been submitted; and that it was agreed to have the work done for 227 $\frac{1}{2}$ l. The report further stated that the committee, having considered Messrs. Beattie & Sons' letter of the 18th inst., along with the report of the clerk of works of the 19th, and the report of the architect that in his opinion the iron contractors were not carrying on the works at such a rate as to insure their completion within the time specified, recommended that the General Committee should recommend the Lord Provost, Magistrates, and Town Council, with the approval of the architect, to give seven days' notice to the contractors, intimating that the committee would take the work out of their hands, and carry it on either by themselves or by other contractors, holding them and their securities liable in all damage and extra expenses arising from the delay or otherwise which had been, or might yet be, incurred.

Mr. Dunlop said that this had had its desired effect, and that matters were now proceeding with more rapidity. Still, they wanted the power craved. They expected to be ready for the roof soon, being already at the last storey of the building. If the contractors for the ironwork kept faith, he thought that by New Year's Day they would have the building covered.

#### ETCHING AND AQUATINT.\*

BY SIDNEY COLVIN.

ETCHING is the name of a variety of metal engraving which has been practised from times little less early than line-engraving. The main point in which it differs from line-engraving is that the lines, instead of being cut with a pointed tool into the surface of the metal plate, are bitten into that surface by the operation of an acid. The meaning of the word "to etch" is thus true to its derivation, which is from a Teutonic root signifying to eat or bite (German *ätsen*, Dutch *etsen*). The material regularly used in etching is copper, but experiments have been made, especially in the early days of the art, with plates also of iron or of zinc. The plate is first covered with a thin hard varnish—or ground, as it is technically called—composed of a mixture of wax, gum mastic, and bitumen, sometimes partly liquefied with oil of lavender. The surface of the grounded plate is next blackened by smoking, and on the ground thus blackened are traced the outlines of the design to be produced. The etcher then takes a straight sharp-pointed instrument or needle, and, holding it like a pen or pencil in drawing, scratches through the ground, to the surface of the plate, first the outlines and then the details and shadows of his design. The copper being thus laid bare in the lines which are to appear as black in the print, the plate is next put into a bath of acid. While the main surface of the plate is still protected by the ground, the acid bites into it wherever it has been exposed by the needle, and produces a sunk line, or network of lines. When the etcher has reason to think the biting has gone far enough for the places which he wishes to print lightest in his work, he removes the plate from the bath, "stops out" those places with wax, so that the acid cannot touch them further, and returns the plate to the bath in order that the lines still exposed may be bitten deeper, and so on until he has obtained the greatest depth which he requires. The ground is then melted off the plate, which is inked and cleaned (but not so

\* From the new "Guide to the Exhibition Galleries of the British Museum."



completely as in line-engraving), and impressions are then taken by means of a press.

This is the method of pure etching, but the name is also extended to include another way of work practised sometimes apart from, but oftenest in connection with, the biting process; the way, that is, of "dry-point." Dry-point consists of drawing or scratching with a needle directly on the surface of the plate, without the intervention of a ground or the use of acid. The lines so produced are rough about the edges, and this roughness is not removed with the scraper, as the roughness of the edges is removed in line-engraving, but left so as to hold the ink and print with the patchy or bloomy effect known as "burr." Many etchers finish certain parts of their work in dry-point, with the express view of obtaining this effect of "burr." Other devices for obtaining depth and softness of shadow are by leaving portions of the plate intentionally uncleaned, or but partly cleaned, so that the plate in these portions prints dark independently of the lines scratched or bitten into it.

The great point of the art of etching is its freedom and directness. The etcher cannot rival the line-engraver in purity, precision, and regularity of curve and hatching; but, subject to this restriction, his method gives him a far wider scope both in the rendering of the facts of life and nature, and in expressing his personal artistic instincts and predilections. From the airiest sketch by which he arrests on copper the momentary dip of a sail or gesture of an arm, to the most brilliant and subtly wrought effects of light and shade, the whole range of artistic suggestion and expression in black and white is open to him. Accordingly the art has been practised mainly, and that by some of the very greatest masters, as one of original design, and only in a secondary degree as one for interpreting the works of others.

*Aquatint.*—The practice of etching, together with the success of the mezzotint engravers, caused some artists in the eighteenth century to consider whether they could not devise a way of using acid to bite in broad tints and washes, instead of only lines, or lines with the burr attaching to them, as heretofore. Several more or less successful experiments in this direction were made in France, but the perfected method of aquatint seems to have been first worked out in England. The process is briefly as follows:—The plate is first varnished, or grounded, with a solution of resin in spirits of wine, which on evaporation breaks up into a multitude of minute and regular granulations. In the interstices of these the copper is exposed, so that if the plate were submitted in this state to the action of acid, and then inked and an impression taken, it would print of an even, dark grain all over. The business of the artist, therefore, having transferred his design to the surface of the plate thus grounded, is to protect from the action of the acid those parts of it which he does not wish to print dark. This he does by painting on them with a brush dipped in turpentine and lampblack, or turpentine and oxide of bismuth. First he covers up, or as it is called "stops out," with this material the parts of the design which are to remain quite white; which done, he gives the rest of the plate a first biting with acid, of such strength as to corrode the copper sufficiently for the palest shadows of the design. The places where the shadows are to remain thus pale he then stops out as before, and gives the plate a second biting for the next darker shadows, and so on for the next, in a series of successive bitings and stoppings-out, until the deepest darks are reached. The ground is then melted away, and the plate is finished and ready to be printed from.

With reference to the origins of etching, the practice of biting-in designs with acid upon metal is said, probably with truth, to have been practised by the Mediæval armourers, and from them to have been adopted by the goldsmiths, or goldsmith painters, who began in the fifteenth century to engrave plates for the purpose of yielding designs on paper. Impressions both from dry-point and from bitten plates appear in the Low Countries towards the close of the fifteenth century. These first-fruits of the art are not here represented, and this section of our exhibition opens with the work of the great Nürnberg master, whom we have already met as a designer on wood and an engraver in line.

Albrecht Dürer in the course of his career made several experiments in etching, most of them, it is thought, on plates of iron; but none are so successful as these two apparently companion pieces of a *Holy Family with Saints* and a *St. Jerome*. Even of these the plates only yielded very few good impressions; those exhibited are fair, neither very strong nor as weak as they most commonly are. A follower of Dürer, Albrecht Altdorfer of Ratisbon, worked alike as architect, painter, goldsmith, line-engraver, etcher, and designer on wood, and was the first artist in Europe to treat landscape independently for its own sake. He used etching exclusively for landscapes and designs of cups, jugs, &c., for jewellers. An example in each of these two kinds is given, but both are weak in impression. Two other artists of the same country, working during the second quarter of the sixteenth century, and influenced much by Dürer, and yet more by Altdorfer, are Hirschvogel and Lautensack; both understood

the methods of biting better than Altdorfer, and produced work less skilful than his in design, but more effective in appearance, though still mainly conventional and confined to little more than outlines. Hirschvogel is represented by three landscapes and two quaint hunting scenes, Lautensack by a landscape, a Bible scene, and a portrait. At Augsburg during the same period the several members of the family of Hopper were extremely prolific in the production of Bible and emblematical subjects, and used chiefly, probably by reason of its facility, the method of etching, which Daniel Hopper is sometimes erroneously said to have invented; an elaborate example of his work is given. Jost Amman, whose style as a designer on wood we have seen already, was also an etcher: he is represented with a composition of emblematic geography and figures, besides a spirited piece representing a discharge of fireworks at Nürnberg in honour of Maximilian II. So far, our examples have been all by artists of the schools of Nürnberg, Ratisbon, Augsburg, or the adjacent parts of Germany. Passing now to the Low Countries, our first example is furnished by a Fleming who struggled hard to be Italian, Frans Floris, with an ineffective enough piece, adapted probably from an antique sarcophagus relief of Minerva and the giants, and designed to commemorate the victory of Lepanto. More genuine and home-grown phases of Netherlandish art are represented by Cornelis Teunissen, with a Fall of the Tower of Babel quaintly realised according to his Dutch imagination, and the eldest Brueghel ("Peasant Brueghel") with a scene of village sports, entirely in the spirit of his pictures, spiritedly drawn and vigorously bitten on a plate of unusual dimensions.

Passing now to the schools of Italy, we find etching little, if at all, made use of in that country until the middle and later half of the sixteenth century; from which time onwards its facile methods (facile at least to use amiss) proved very tempting to the enervated artistic spirit of the race, and partly superseded, and partly helped to deteriorate, the severer skill of the line-engraver. The *Holy Family*, by Andrea Medolla, is designed in the over-suave spirit of the time, and printed with effects of burr and inking that may probably be accidental. Battista Franco etches a well-known composition of Titian in a manner hardly to be distinguished from that of careless line-engraving; then come two anonymous etchings after the same master, one of a *Virgin and Child with Saints*, another of a landscape with shepherds driving a flock beside a stream: both formerly, but quite wrongly, attributed to Titian himself. The Italian series is here interrupted in order to bring into comparison with this Venetian landscape those etched, in a manner perhaps suggested by similar examples, by the Italianised Fleming Paul Bril and the Dutchman Abraham Bloemart. Following next the influence of the Italian Renaissance into France, we find subjects of saints, with landscape backgrounds, etched by anonymous masters of the Fontainebleau school, and by Etienne du Pérac, with more both of sentiment and vigour than is common about the same time in Italy itself. Witness the examples which follow of the four famous academical masters of Bologna, Lodovico and Annibale Carracci, Guido Reni, and Guercino: all devotional pieces of the slightest kind, and without the degree of academical power and accomplishment which the same masters showed undeniably in their pictures. A much humbler German etcher of the same time, that is the turn of the sixteenth and seventeenth centuries—Bartholomäus Reiter—handles similar subjects with more conviction and expression; and a Neapolitan painter of Spanish origin, Ribera, shows in them a certain real vigour both of ascetic sentiment and of artistic touch.

We have now arrived at the period when men of genius, born about the close of the seventeenth century or in the opening years of the next, arose to give new value and significance to the etcher's art. First among these comes Vandyke, with four examples, in various states, of his famous and brilliant etched portraits of contemporary artists, and two elaborate subject-pieces handled in a manner of less freedom and directness, and more resembling that of a line-engraver who uses etching for the preparatory labour of his plates. Next Claude Lorraine, who in his etched designs of classic landscape and architecture succeeded in expressing, though with a comparatively tentative and uncertain hand, much of the same perfect feeling for the composition and relation of forms and masses, and the gradations of light and shade, as inspired his pictures. A French contemporary of Claude who shared his feeling and imitated his effects, but in a dryer and more academic fashion, was Gabriel Perelle: the sterner view of Roman classic landscape characteristic of Gaspar Poussin is represented next. Among native Italians, the chief etcher in the first half of the seventeenth century was Stefano della Bella, who died young, but not before he had produced a vast number of plates executed with an unsurpassed dexterity and lightness of hand. Airy studies of character and costume, and grotesque or graceful decorative fancies, compose almost the whole of this master's work: while Callot, who had wandered young from Lorraine into Italy, combined with an equal adroitness and vivacity of touch on a minute scale a far greater reality of theme



and grasp of human character and expression. The serious side of Callot's talent is represented by four subjects from the Passion of Christ; the burlesque side by the well-known riotous travesty of a *Temptation of St. Antony*. Only second to the influence of Callot in spreading a taste for etching throughout Europe in the seventeenth century was that of a French artist of a very different temper, Abraham Bosse, who, besides producing a number of careful plates, was the author of a treatise on the technicalities of the art. Directness of effect and expressive freedom of touch were not the chief points of etching as conceived by Bosse: he aimed rather at rivalling the effects of the line-engraver by mechanical regularity of handling and brilliancy of light and shade, so that it is often hard to tell whether or no his plates have been finished with the burin. A similar aim, attended by a similar ambiguity, prevails in much of the multifarious work of Hollar, a Bohemian who settled in England and laboured here during the Commonwealth and Restoration period with inexhaustible faithful industry and scanty reward. Our specimens of Hollar's work include costume and portrait pieces, natural history, and illustrations of poetry and fable. Immediately after them are placed a group of fable and animal subjects by English artists who etched under the influence of Hollar, in a similar precise and graver-like manner, namely, Richard Gaywood, Francis Barlow, and Francis Place. The designs for most of these subjects are furnished by Barlow, who was a prolific though clumsy enough draughtsman.

From this point we go back to take up the history of etching in the Low Countries, where throughout the seventeenth century the art was practised assiduously by many masters, and by one, Rembrandt, with incomparable power. Among Dutch artists of Rembrandt's day but senior to him, Jan Van de Velde handled the needle somewhat dryly, having greater skill as a line engraver, and Antoine Waterloo produced innumerable studies of forest scenery, sometimes, as in the present instances, animated with Scriptural or Classical figures, and technically not ineffective, though wearisome by reason of their conventional monotony of character and design. At this point follow our examples of Rembrandt himself, who exceeded all other etchers in mastery alike of human gesture and expression, and of the forms and features of landscape, and was incomparably skilled in conveying the effect he desired, whether by an economical device of the fewest and most expressive strokes, or by a combination of the richest and most elaborate effects of shading, biting, and printing. His work in Bible illustration, in portraiture, and in landscape is all represented here with good, although not the very rarest or most brilliant, examples. Ferdinand Bol stands alike as a painter and etcher for the group of Rembrandt's immediate pupils and followers in Holland.

Returning now to Italy, we find a popular seventeenth-century painter of animal and Scripture subjects, the Genoese Benedetto Castiglione, influenced as an etcher by the examples of Stefano della Bella and of Rembrandt almost equally. Salvator Rosa follows, with four large Classical and emblematic subjects technically mere outline sketches on the copper, and less characteristic of his powers than his usual pictorial motives of beggar-and-bandit-haunted landscape. The succeeding examples illustrate the various uses of etching by Italian artists of the latter half of the seventeenth century. The spirit of the antiquarian draughtsman is represented by Galestruzzi, with his plate from the bas-relief of the *Apotheosis of Homer* now in the British Museum; that of the facile and fashionable devotional and decorative painter, working experimentally with needle and copper, by Luca Giordano with his *Woman taken in Adultery*; that of the ordinary craftsman in etching and engraving, by Biscaino and Lorenzini.

Then we return again to the fresher inspiration and more spirited handiwork of the Dutchmen; and first of those Dutch pastoral painters whose native instincts were modified during a sojourn in Italy by the influences of Roman scenery and tradition. Of these, both Jan Both and Berchem were prolific and skilful etchers. They are followed here by other Dutch masters who lived at home and escaped the fascinations of the south; Ruysdael, the great master of woodland romance and mystery, whose etchings, however, are tame beside his pictures; and Bakhuyzen, one of the most diligent students of his native shores and seas. Next comes a group of the lovers, both Dutch and Flemish, of homely and grotesque humanity. First Andries Both, who despite his travels in Italy, and even in saintly subjects like these, never lost his rude spirit of caricature; next, the great Antwerp painter of peasant life and tavern humours, Teniers, and then the scarcely less famous Haarlem painter of similar themes, Adriaen van Ostade, with his weaker follower Cornelis Bega. All these masters express themselves by means of the needle and copper-plate with vigour and originality, though none with anything approaching the powers and resources of Rembrandt. A relatively equal measure of skill in etching was attained by two of the purely native pastoral painters of Holland, Paul Potter and Adriaen Van de Velde, who close the series of the famous Netherland

masters of this age. Following them are placed examples of two German artists, J. H. Roos, who worked in the Italian romantic pastoral vein with great applause in the third quarter of the seventeenth century; and Ridinger, who continued through a considerable part of the eighteenth to etch subjects of forest life and sport.

The seventeenth century was pre-eminently (leaving our own generation out of account) the great age of etching. Passing to the eighteenth, we find the art less practised, and that generally in a more trifling, imitative, and amateur fashion. Our next two examples are French, and represent the transition from the one century to the other. Claude Gillot initiates that style of treating Pagan mythologic and decorative themes which we shall find practised later, with an exquisite alertness of fancy and of hand, by Eisen and Fragonard. The many-figured scene of court ceremonial by Pierre Brissart is an example of a widely different use to which etching was frequently turned at this time and afterwards. In Venice the art was deftly practised throughout the greater part of the century by both the elder and younger Tiepolo: the former of whom (Giovanni Battista) etched chiefly trivial Classical or fancy subjects, while the great devotional and decorative paintings with which it was his main business to adorn the churches and palaces of Venice were reproduced on copper by his son Giovanni Domenico, known as Tiepoletto. A versatile and accomplished, but purely imitative and unoriginal German artist, Dietrich, who was technically the most skilful etcher of his time, follows with a Scriptural subject and two landscapes. After the airy outline sketches on copper of Eisen and Fragonard already mentioned, follow the contrasted efforts of a French amateur, Marcenay de Ghuy, to obtain the utmost finish and brilliancy of effect by minute burin-like shading, perhaps actually finished with the burin, and next to these come specimens of portrait work by the Englishman Worlidge, a sedulous copyist and tolerable imitator of Rembrandt. The two great Continental illustrators and vignette designers of the eighteenth century, the Germanised Pole Chodowiecki and the Frenchman J. M. Moreau, follow—the former with two sets of illustrations to Shakespeare, brightly designed on a minute scale: the latter with two etched title-pages and a frontispiece. Then comes Captain William Baillie, skilled alike in mezzotint, stipple and etching, but best known by the liberties he took with Rembrandt's finest plate in its state of ruin; he is here represented by two heads after Salvator Rosa and Frans Hals respectively. The landscape and pastoral work of the time is illustrated next, with pleasant examples by the Swiss-German poet, scholar and artist, Solomon Gessner, and one by the elder George Barret, a good landscape painter, especially in water-colours, according to the broad and generalising manner of that day in England, but possessing no power, as an example shows, over the technical resources of etching.

At this point a new technical method makes its appearance, that namely of aquatint, practised sometimes in combination with and sometimes apart from the ordinary method of etching with incised and bitten lines. First come examples of the imperfectly successful experiments of St. Non and Le Prince, and then of the method as perfected in England by Paul Sandby. Next, some small landscapes in mixed etching and aquatint by the German pastoral painter Kobell. Another German, Balzer, follows with a *Virgin and Child*, treated in the same mixed method and with an unusual depth of biting and force of effect. In France aquatint became very popular among the designers of social types and scenes in the days of the Revolution, the Directoire, and Consulate: foremost among whom was Debucourt. By way of contrast with his scene of festivity in the Café Frascati, is placed a large plate of the Fall of the Bastille, etched in the ordinary manner by Thévenin. Then we pass to the Classic landscape work of the time, as practised at Rome or under Roman influence by artists from the north, in ordinary etching by the German dies, and in aquatint by the Scotchman Richard Cooper. A French etcher of great power, who worked in the regular manner towards the close of the eighteenth century, with a leaning now to the example of Rembrandt and now rather to that of Abraham Bosse, was J.-J. de Boissieu. Next to his work comes a solitary and very rare example of etching from the hand of the great French painter, Ingres; and in the quality of pure and expressive draughtsmanship on copper, without regard to effects of atmosphere and mystery, this portrait is among the very first masterpieces of the art. A very different branch of French taste and practice is illustrated in the clever aquatint by Jazet after Horace Vernet's design of a *Mameluke and his Horse*. The powerful and cynical Spaniard, Goya, comes next with one original plate and one after Velasquez.

Returning now to the home art of England—in the opening decades of this century we find etching practised for the rendering of architecture and landscape by the two chief painters of the Norfolk school, Cotman and Crome, with a characteristic fine feeling for the quality of their subjects, but little technical command over the resources of the art. Work more effective from this point of view was produced about the



same time by inferior men, such as Cuitt and Cave. But it was among artists of the Scotch school alone that etching was in these days practised, especially in figure subjects, with real understanding of its means and vigour of effect. Andrew Geddes equally in portrait and landscape shows himself an apt student both of Rembrandt and of nature; and Wilkie etched subject-pieces forcible alike in character and chiaro-oscuro. In the meantime an obscure drawing-master of Salisbury, D. C. Read, was etching the scenery of his native county with a skill and feeling for the true effects of the art which were hardly equalled by more famous men, and won for him the warm praise of Goethe. The last English etcher represented is Samuel Palmer, the painter, who practised diligently in this medium with the same rare feeling as is shown in his water-colours for Classic and poetic forms of landscape, and for the conflict of stormy darkness and sunset light.

Turning to the work of the foreign schools during the first half of the century, we find the Swiss landscape painter, Calame, making etchings, with no great mastery, from his native scenery, while the Düsseldorf J. W. Schirmer composes forest and lake views with some learning and power, but without the directness and freshness which this art requires. The real great revivers of etching in this century were the French, of whom we first encounter Méryon, the sailor turned artist, whose intense and at last crazed imagination was seconded by a hand of extraordinary power, and whose studies of architecture, especially the architecture of old Paris, are unrivalled. Next follows the still surviving veteran Jacque, who has been for many years of his life a versatile and brilliant etcher, and is here represented by two studies of animals and landscape. By the great painter of peasant life and labour, Millet, are two etchings which show little care for the technical niceties of the art, but express adequately and with directness his extraordinary instinct for the expressive and monumental qualities of grouping and gesture in labouring figures. With a large and powerful storm-landscape by the painter Daubigny the series closes; leaving us on the threshold of that active and fruitful revival of the etcher's art, for the purposes alike of original expression and of the reproduction of pictures, which has taken place during the last thirty years both on the Continent and at home.

#### HOLYROOD ABBEY.

AN article on the abbey of Holyrood, which was founded in 1128 by King David I., appears in the *Scotsman*, from which the following is abstracted:—

At the time of the Reformation its annual revenue consisted of 442 bolls of wheat, 640 bolls of barley, 560 bolls of oats, 500 capons, 2 dozen hens, 2 dozen of salmon, 12 loads of salt, in addition to a number of swine and a sum of 250*l.* sterling. The canons had extensive jurisdiction in the Canon-gate and vicinity of Edinburgh, and erected mills upon the Water of Leith (which still bear the name of Canonmills), in North Leith and other quarters. The ecclesiastical annals of the abbey, like the charter of the city of Edinburgh, are extremely meagre. From King James VI. to James VII. the building was occupied as a parish church by the inhabitants of Canon-gate, who appear to have used the ground to the east as a burial-ground. Within the walls of the abbey itself were placed the remains of distinguished individuals, as well as those of Royal blood. For twenty years during the successive reigns of James VI. and his son Charles, the English liturgy was read in the church, but the very strong antipathy which the people then entertained to Episcopalian forms led to a change. In 1659 the Marquis of Hamilton, at that time Royal Commissioner of Holyrood House, had an intimation sent him from the citizens that if he continued to make the attempt to have the liturgy read, the officiating clergyman would be assuredly murdered. The marquis abandoned the idea of having it read. It is right to state in this connection that prior to 1633, Edinburgh had been created a bishopric by King Charles I. He annexed to the new see the church or abbey of Holyrood House, and appointed its minister to be one of the prebendaries of St. Giles's. The charter granted by him was ratified by King Charles II. King James VII.—who, as Duke of York, had for a considerable time his abode within the palace—conceived the idea of converting the church into a chapel royal, and providing it with a throne for the Sovereign, and stalls for the Knights Companions of the Order of the Thistle. In 1687, on his order, the magistrates of Edinburgh delivered up the keys to the Lord Chancellor, the Earl of Perth, and great improvements were effected on the internal appearance of the building. The church was provided with a mosaic floor of marble, a throne was erected, and stalls were provided; while a splendid organ, beautifully decorated with armorial and artistic devices, served the purpose for which it was designed by its royal projector. But when the populace became aware that High Mass was performed therein, their fury knew no bounds; they overpowered the military guard,

tore to shreds the costly ornaments, set fire to everything that was of an inflammable nature, and left nothing behind but the bare walls. Not content with wrecking the abbey, their mad infuriated zeal caused them to commit further atrocities in tearing open even the coffins of David II., James II., James V. and his second son, and of King Henry (Lord Darnley). The abbey, so destroyed at the time, remains a wreck at the present day. No great use has been made of it since the Revolution, except as a burial-place for the illustrious dead of Scotland. The last one of the Scottish nobility who found his grave there was the recently deceased Earl of Caithness. The building, however, still continues as a chapel royal.

The abbey at one time consisted of cloisters, dormitory, refectory and other comfortable adjuncts; only the nave, which appears to have been the western part of the conventual church, appears to have survived the Earl of Hertford's hostile irruption in 1544, to which future reference will be made. It seems to have been the nave of the original edifice which James VII. repaired and converted into the chapel royal. It would not be surprising if the original abbey covered nearly all the ground upon which the Palace of Holyrood now stands, as well as the grounds afterwards known and appreciated in sanctuary times as St. Ann's Yards, which it is believed were originally a place of sepulture in connection with the abbey. The conventual church was originally on the north side of the abbey. It was of a crucifix form. There are still some remains of the transept, which formed the north and south ends. In the line of the transept was a square lantern tower, which rested on four large pillars with lofty connecting arches. The centre and side aisles of the nave were divided by a row of nine clustered piers on both sides, supporting eight equilateral pointed arches. The gallery was over the side aisles. The roof was of vaulted construction, similar to ancient Gothic ecclesiastical edifices. The buttresses and canopied niches and pinnacles were in exquisite taste, and some of these are still in admirable preservation; but many of them have been destroyed in consequence of the somewhat coarse usage which the stupid and misdirected zeal of the mob brought to bear upon them. So far back as 1332 the gold and silver vessels of the abbey were despoiled. The English soldiers of the period manifested too plainly an eager desire to plunder and destroy the ecclesiastical edifices of the time. Three years thereafter the Abbey of Holyrood was burnt to the ground by King Richard II. It has never been ascertained when the abbey was rebuilt after having been burnt down, but it was embellished and made available for useful purposes by the Abbot Crawford, Lord High Treasurer of the kingdom, who died in 1483. In April 1544 the Earl of Hertford invaded Edinburgh, when the Abbey and Palace of Holyrood were almost reduced to ashes. The choir, transept, and lantern tower were destroyed, and only the nave was left. A brazen font, of rare value, from which the royal infants were usually baptized, was borne away by Sir Richard Lea, captain of the English Pioneers, who presented it to the church of St. Albans.

After the battle of Pinkie in 1547, Protector Somerset, fired with an intense hatred of Catholicism, sent two of his generals to pillage the abbey. The monks, however, had fled with their valuable treasures, and so the invaders for the time being had to content themselves with stripping the lead off the roofs of the church and palace, taking down the bells, &c. Twenty years thereafter, viz., on June 18, 1567, only two days after Queen Mary's first imprisonment, Lord Glencairn was instructed by the governing party in the nation to destroy the abbey. This he did most thoroughly by ridding it of what was regarded as the monuments of idolatry, because he utterly destroyed its altars, pictures, and statues. In a very ruinous condition did the edifice remain, although it was utilised for church purposes, until the year 1633, when it would appear, from an inscription above the west door, that during the reign of Charles I. important repairs were effected. It was probably at that time that the large window to the east, which bears traces of being somewhat modern, was built. In 1758, the state of the chapel royal having been brought under the attention of the Barons of Exchequer—a Scottish Court now for a long period obsolete—their lordships contracted with a tradesman to have the chapel re-roofed. The contracting party, instead of supplying a slate roof, provided it with a flag roof, which proving too heavy for the walls, the enormous load fell in the winter of 1768, bringing away with it not only the roof, but also the upper stone gallery.

In 1795, the mullions and tracery of the east window having become loose through the force of a severe storm, the window fell to the ground. This was afterwards repaired by the Barons of Exchequer in 1816, and other improvements were effected to prevent its dilapidation.

When George IV. visited Edinburgh in 1822, it was thought desirable to bring under his attention the miserable condition of this venerable edifice. The King directed the complete renovation of both the palace and the abbey. To accomplish this object the sum of 4,000*l.* yearly was, for a



period of six years, appropriated out of the Crown revenues of Scotland. The palace of Holyrood House has been restored; but the abbey stands now as it did then—fit companion for either Abbotsford or Melrose, or the ruin of Linlithgow Palace, which Lord Rosebery recently designated "the Windsor of Scotland."

### CHURCH BUILDING AND RESTORATION.

**Epworth.**—The memorial-stones of the Wesley Memorial Chapel at Epworth have been laid. The memorial will be disposed in the form of a quadrangle, with chapel, schools and proposed manse on three sides, and a marble statue of John Wesley in the centre. The chapel and schools will be in the Early English-Gothic style, built of brick, with Shipley stone facings and Ancaster stone dressings, and will seat about 400 in the body and fifty in an end gallery, which is reached by a staircase in the tower. The latter, with a spire, will be erected to a height of 80 feet. There are two aisles, with a couple of shallow transepts, organ chamber and chancel. The school has a separate entrance from the quadrangle and consists of a large room, well lighted, with accommodation for 200 persons, together with classrooms, &c. The contract price for the work is 2,742*l.* Mr. Charles Bell, F.R.I.B.A., is the architect, and Mr. H. Kelsey, of Epworth, the builder.

**Leytonstone.**—In April last plans for the Wesleyan Methodist schools and chapel extension were invited in competition from six architects, and on the advice of the referee those submitted by Mr. George Baines, 4 Great Winchester Street, E.C., were selected. Since this decision the committee have purchased an adjoining house, and propose to carry out a much larger and more comprehensive scheme in sections, from the designs of the above-mentioned architect. Tenders for the main schoolroom and chapel extension have been accepted, the work to commence on the site, March 1 next.

### SCHOOL BUILDINGS.

**Beith.**—The Spier school, erected about half a mile from Beith, has been formally opened, having been built and endowed from funds left by the late Mr. Spier, of Marshalland, as a secondary or higher grade school established under the scheme of the Scottish Endowment Commissioners. Mr. Sellars, of Glasgow, the architect, has in the design, while adapting it for its special purpose, reproduced some of the features (particularly in the tower and the large gable in front) of the ancient College of Glasgow. In the north end of the buildings are situated a series of four classrooms, which will accommodate about ninety girls. The most prominent feature in the elevation is the tower, which rises to a height of 105 feet. The main entrance is through the lower part of this tower, which forms a vestibule about 12 feet square, and here is erected one of the marble tablets belonging to the Trust. The classrooms for boys are six in number, and will accommodate about 180. Three of these rooms are on the ground floor, and three in the second floor, and all are well lighted and ventilated. On the first floor is a large apartment called the common hall, where all the pupils can assemble on occasion; and entering from this hall is an apartment, formed in the tower, which is named the monument-room, and which is intended for the reception of some memorial busts of the Spier family. The heating is by hot-water pipes. There is also a house for the head-master, and accommodation for boarders is afforded here. The cost of the building, including laying-out of grounds, is estimated at 12,000*l.*

**Lanark.**—The grammar school has been reopened, after being enlarged and remodelled. Originally it was constructed for nearly 400 pupils. It is now capable of taking in 549. The plans of the restoration were prepared by Mr. Murray, of Heavyside, and the tradesmen all belonged to Lanark. The total cost of the work is about 2,200*l.*

### GENERAL.

**Mr. H. D. Appleton, F.R.I.B.A.,** president of the Architectural Association, is to deliver an address on "The Affiliation of Architectural Student Societies" to the members of the Birmingham Architectural Association on November 20.

**A Portrait,** painted by the late Mr. Frank Holl, R.A., was presented to Lord Brassey, on Wednesday, at Normanhurst Court.

**Competitive Designs** are sought by the Edinburgh Town Council for the proposed statues of Wallace and Bruce, to be erected in Princes' Street Gardens.

**A Fragment** of masonry on Tuesday fell from the top of the Monument. An examination is to be made, and meanwhile it is stated that iron girdwork filled with sand will be placed round the column to intercept any of the stonework in case it falls.

**Memorial Stained-glass Windows** of the late Mr. John Pearson and Mr. Thomas Knowles are proposed to be placed in the church of St. Mary, Ince-in-Makerfield.

**Mrs. Andrew Carnegie** has given 900*l.* to the building fund of the free library at Grangemouth, N.B., the foundation-stone of which Lord Zetland has undertaken to lay on the 1st prox.

**The Artists' Rifle Corps** have received sanction from the War Office to remove their headquarters to the spacious building erected by the corps in Duke's Road, St. Pancras.

**The Walsall Science and Art Institute,** erected from the designs of Messrs. Dunn & Hipkiss, of Birmingham, was opened on Monday by Sir Charles Forster, M.P.

**An Ornamental Lake** for boating purposes is proposed to be constructed at Dundee, by extending the Esplanade wall so as to enclose an area of 37 acres. It is stated that it can be made without great cost, and would have 6 feet of water at low tides and 12 feet at spring tides. A committee has been appointed to report on the scheme by the Police Commissioners.

**A Faculty** was granted on Tuesday in the Liverpool Consistory Court to pull down the old church of St. Anne, Stanley, and rebuild it on an enlarged site. The cost will be defrayed by Mr. T. F. Harrison, shipowner, of Liverpool.

**The Finance Committee** of the Liverpool Corporation have made a recommendation to advertise that premiums of 100*l.* and 50*l.* respectively will be offered for designs and plans for erecting shops and other business premises upon the land situate at the corner of Church Street and Parker Street.

**At a Meeting** held in Grantham last week it was decided to erect a drinking fountain, surmounted by a statue, to the memory of the late Hon. F. J. Tollemache, of Ham House, Petersham, Surrey, from a design by Mr. Charles William Smith, architect, of Buckminster, Grantham.

**The Ecclesiastical Commissioners** have approved of plans for the erection of a church containing about 600 sittings and to cost 4,000*l.*, upwards of 2,000*l.* of which has already been obtained, for the Newtown and Marsh Green districts of the parish of Pemberton, near Wigan.

**A Meeting** of inhabitants was held on Monday, in Poplar, at which it was resolved to urge upon the Metropolitan Board of Works, and, if necessary, upon the Home Secretary, the importance of proceeding without delay with the construction of the Thames Tunnel for vehicular traffic.

**The Old Church** at Garston, rebuilt in 1715 by Edwar Norris, has recently been taken down, and from the foundations have been taken carved stones from the older church, showing capitals of pillars, pieces of the shafts, window tracery, jambs and sills, the copings of battlements, cornices, gutters, and gargoyles, also the fragments of what may have been a richly panelled late Gothic mortuary chapel of the Norris family. It is intended to retain some of these fragments, but many of them are being recut to build the boundary wall of the churchyard.

**The Tower** of the parish church at Berkeley, Gloucester, is to be restored, from plans by Mr. B. H. Ransford, surveyor to Lord Fitzhardinge.

**The Norwich Town Council** has favourably received a memorial to take steps to free Carrow Bridge. The existing mortgages amount to 3,459*l.*, and a new bridge, it is stated, will have to be constructed at no distant time.

**At a Public Meeting** held in Aston on Friday last, it was decided to take steps for the building of a hall and recreation-room, the total cost of which is put down at about 3,000*l.*

**A New Chancel,** organ chamber, and vestries are to be added to the church of St. Luke, Darlington, from the designs of Messrs. Clark & Moscrop.

**A Paper** on "Light Railways" will be read by Mr. William Lawford at the meeting of the Society of Engineers on Monday.

**The Fleming Hospital for Sick Children,** erected on the Moor Edge at Newcastle, at the sole cost of Mr. John Fleming, solicitor, of Newcastle, was on Thursday opened by Lord Armstrong, of Craigside.

**The Hospital** erected from the designs of Messrs. Bottle & Olley in Great Yarmouth, at a cost of 10,000*l.*, has been opened.

**The Winsford Local Board** have decided to obtain a portrait, to be placed in the Free Library, as a memorial of the late Mr. Robert Verdin, M.P.

**The Programme** of lectures for the forthcoming session of the Birmingham and Midland Institute has been issued. In the archaeological section, of which Mr. Timmins is president and Mr. J. A. Cossins honorary secretary, papers are to be read by Mr. W. A. Cotton, the Bromsgrove antiquary, on "The Regal Mints of Tamworth, Warwick, and Coventry"; by Major-General Phelps, on "The Cave Architecture of Western India"; and by Mr. T. W. Camm, on "Old Stained Glass." Mr. Matesdorf is to lecture on "The Cartoons of Raphael" and on "The Educational Value of Art."

**CRIMINAL PROCEEDINGS,** under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, SEPTEMBER 28, 1888.

## CONTRACTS OPEN.

ABERDEEN.—Oct. 1.—For Building Concrete Engine Seat at Cults Steam Pumping Station. Mr. W. Boulton, Burgh Surveyor, Town House, Aberdeen.

ABERDEEN.—Oct. 2.—For Building Workmen's Cottages at Culter Paper Mills. Messrs. Jenkins & Marr, Architects, 16 Bridge Street, Aberdeen.

ALTOFTS.—Oct. 1.—For Building Detached Residence. Mr. G. H. France, Architect, 8 Barstow Square, Wakefield.

ANCOATS.—Oct. 3.—For Building Police Station. The City Surveyor, Town Hall, Manchester.

BLAENAVON.—Oct. 3.—For Additions to Endowed Schools. Mr. E. A. Lansdowne, Architect, 25 High Street, Newport, Mon.

BOURNEMOUTH.—Oct. 4.—For Wrought-iron Unclimbable Fencing with Gates, &c. Mr. G. R. Andrews, Surveyor, Town Hall Chambers, Bournemouth.

BRADFORD.—Oct. 9.—For Building Shops and Business Premises, Kirkgate. Messrs. Empsall & Clarkson, Architects, 55 Tyrrel Street, Bradford.

BRENTFORD.—Oct. 2.—For 9-inch Brick Wall (230 feet), with Coping and Railing. Mr. Lacey, Surveyor, Clifden House, Boston Road, Brentford.

CANTERBURY.—Oct. 2.—For Reparation of Butter Market. The City Surveyor, 8 Watling Street, Canterbury.

EAST HALTON.—For Building Wesleyan Chapel, School-room, &c. Mr. Richard Coulson, Architect, 5 Bishop Lane, Hull.

EXETER.—Oct. 2.—For Building Two Dwelling-houses. Messrs. Packham, Croote & Stuart, Architects, 93 Paris Street, Exeter.

FERNDALE.—For Building Five Houses. Mr. Thomas Thomas, Dolywern Cottage, Ferndale, Wales.

GRANTON.—For Providing and Laying Cast-iron Pipes, &c. Messrs. Niven & Haddin, C.E., 131 West Regent Street, Glasgow.

GUILDFORD.—Oct. 10.—For Building Cookery Classrooms to Two of the Board Schools. Mr. W. G. Lower, Architect, 12A High Street, Guildford.

HEREFORD.—For Building Eye and Ear Hospital. Mr. E. H. Lingen Barker, Architect, 146 St. Owen Street, Hereford.

HINCKLEY.—Oct. 4.—For Cast-iron Socket Pipes (13½ miles). Messrs. T. & C. Hawkesley, C.E., 30 Great George Street, Westminster.

H.M. OFFICE OF WORKS.—For Repairs, &c., during three years to Buildings, Chester, Preston, Warrington, Leeds, and Hull. Mr. W. H. Primrose, Secretary, 12 Whitehall Place, S.W.

HORNSEY.—Oct. 8.—For Supply of Rolled Iron Joists. Mr. T. de Courcy Meade, Surveyor, Southwood Lane, Highgate, N.

HOYLAND NETHER.—Oct. 1.—For Building Police Station. Mr. J. Vickers Edwards, West Riding Surveyor, Wakefield.

KILBURN.—For Completing Houses. Mr. William Eve, Architect, 10 Union Court, E.C.

KILLARNEY.—Sept. 29.—For Restoration of Protestant Church, Building Organ, and Heating Chambers. Mr. J. F. Fuller, Architect, 179 Great Brunswick Street, Dublin.

LEYTONSTONE.—Oct. 2.—For Repairs, &c., to School. Messrs. A. & C. Harston, Architects.

PENMAENMAWR.—Oct. 6.—For Rebuilding Parish Church of Dwygyfylchi. Mr. E. M. B. Vaughan, Architect, Cardiff.

SANDOWN.—Oct. 4.—For Construction of Sea Wall and Esplanade. Mr. J. Newman, Engineer to the Local Board, Sandown, Isle of Wight.

SOUTHALL.—Oct. 1.—For Underground Rain-water Tank (50,000 gallons). Mr. J. Bedford, Guardians' Offices, Northumberland Street, W.

SOUTHEND-ON-SEA.—For Building Five Shops and Houses. Mr. E. Wright, Architect, High Street, Southend.

SUTTON.—Oct. 3.—For Boundary Walls, Gate, Lodge, &c., St. Finton's Graveyard. Mr. T. H. Atkinson, Clerk to the North Dublin Guardians, North Brunswick Street, Dublin.

WANDSWORTH.—Oct. 3.—For Repairs to Infirmary. Mr. E. H. Taylor, Union Offices, New Wandsworth.

WINDSOR.—Oct. 4.—For Sludge-pressing Room and Sludge Store Tank at Sewage Works. Mr. T. V. Davison, Borough Surveyor.

YORK.—Oct. 9.—For Building Mortuary at Fever Hospital. Mr. E. G. Mawbey, City Surveyor.

## TENDERS.

### BIDEFORD.

For Widening Quay. Mr. HENRY CHOWINS, Borough Surveyor, Bideford.

Hill & Co., Plymouth	£6,967	9	4
Duke, Plymouth	6,657	8	4
Reed, Plymouth	5,953	0	0
Sidethall & Co., Merthyr Tydvil	5,497	0	0
Taylor, Westward Ho	5,250	0	0
Seldon & Slee, Barnstaple	5,188	0	0
Glover & Co., Abbotsham	5,125	0	0
E. Ellis, Bideford	4,775	0	0
Prior & Co., Bideford	4,740	10	0

### BOSCOMBE.

For Construction of Pier, for the Boscombe Pier Company, Limited.

#### Approach.

Head, Wrightson & Co., Westminster	£3,254	10	0
Dorset Iron Co., Poole	2,000	0	0
J. White, Bournemouth	1,950	0	0
McWilliam & Son, Bournemouth	1,850	0	0
E. Howell, Poole	1,532	10	0
Heenan & Froude, Manchester	1,434	0	0
Jenkins & Son, Bournemouth	1,272	0	0
M. Loader, Bournemouth	1,082	0	0
J. EDWARDS, Southborne (accepted)	938	14	0

#### Pier.

Dorset Iron Co., Poole	4,209	0	0
Head, Wrightson & Co., Westminster	4,162	6	8
Heenan & Froude, Manchester	3,891	7	8
E. HOWELL, Poole (accepted)	3,813	6	0

#### Extra Spans of 40 Feet.

Dorset Iron Co., Poole	397	0	0
Heenan & Froude, Manchester	385	0	0
Head, Wrightson & Co., Westminster	346	0	0
E. HOWELL, Poole (accepted)	330	0	0

#### Landing Stage.

Heenan & Froude, Manchester	1,847	0	0
Head, Wrightson & Co., Westminster	1,860	6	8
E. Howell, Poole	1,293	15	0
Dorset Iron Co., Poole	979	0	0

No tender accepted for Landing Stage.

### BRIDLINGTON QUAY.

For Extension to Gasworks. Mr. J. EARNSHAW, Architect, Carlton House, Bridlington Quay.

#### CLARK (accepted).

### BURNHOPE.

For Building Primitive Methodist Chapel at Burnhope, County Durham. Mr. W. T. C. HALLAM, Architect, 56 Westgate Road, Newcastle-on-Tyne.

G. Craig, Sacriston	£599	4	2
W. H. Pace, Sunderland	582	17	2
Weddle Bros., Ponteland	560	5	0
J. Routledge, Armfield Plain	559	18	0
J. D. Carr, Tow Law	540	0	0
J. PYBUS, South Benwell (accepted)	521	0	0



## CROYDON.

For Classroom for Fifty-six Scholars and Additional Class-rooms and Lavatories to the Junior Department, Beulah Road School. Mr. R. RIDGE, Architect. Quantities by Architect.

Monckton . . . . .	£707	0	0
Bryan . . . . .	580	0	0
Coleby & Co. . . . .	575	0	0
Jones . . . . .	550	0	0
Henley & Co. . . . .	540	0	0
Batley & Linfoot . . . . .	538	15	1
Pearson & Co. . . . .	538	0	0
Docking . . . . .	531	0	0
J. & C. Bowyer . . . . .	519	0	0
Mid-Kent Building and Contracting Works . . . . .	499	10	0
Ockenden . . . . .	497	0	0
Pearce . . . . .	490	0	0
Smith & Sons . . . . .	465	0	0
Hole . . . . .	459	0	0
Verrall . . . . .	455	0	0
Knight & Bennett . . . . .	450	0	0
Caplen & Redgrave . . . . .	447	4	0
WINBURN (accepted) . . . . .	435	0	0

For Additional Cloak-rooms and Lavatories, Girls' and Infants' Departments, South Norwood Schools, for the Croydon School Board. Mr. R. RIDGE, Architect. Quantities by Architect.

Monckton . . . . .	£430	0	0
Henley & Co. . . . .	391	0	0
Bryan . . . . .	369	0	0
Docking . . . . .	358	0	0
Jones . . . . .	354	0	0
Pearson & Co. . . . .	350	0	0
Batley & Linfoot . . . . .	323	19	8
Ockenden . . . . .	321	0	0
J. & C. Bowyer . . . . .	311	0	0
Verrall . . . . .	305	0	0
Winburn . . . . .	295	0	0
Smith & Sons . . . . .	287	0	0
Caplen & Redgrave . . . . .	286	0	0
Pearce . . . . .	279	0	0
Mid-Kent Building and Contracting Works . . . . .	277	10	0
HOLE (accepted) . . . . .	240	0	0

## CARDIFF.

For Construction of Sewer in Tintern Street, Canton, Cardiff. Mr. P. PRICE, Surveyor.

J. Rich, Cardiff . . . . .	£160	0	0
J. Robbins, Cardiff . . . . .	150	0	0
R. Day, Cardiff . . . . .	147	0	0
J. C. Pearson, Cardiff . . . . .	146	10	0
J. Allan, Cardiff . . . . .	145	15	0
J. Rees, jun., Ely . . . . .	142	5	0
F. S. Lock, Cardiff . . . . .	116	5	0
G. SMALLRIDGE, Cardiff (accepted) . . . . .	105	0	0

## CORK.

For Works for the Killard River Drainage Scheme. Mr. L. L. PURCELL, Engineer, 53 Grand Parade, Cork.

Donoghier, Clonakilty . . . . .	£887	0	0
Flanny, Glosheen . . . . .	880	0	0
Gorr, Cork . . . . .	789	0	0
Mocossy, Crosshoven . . . . .	760	0	0
Walsh, Killeens, Cork . . . . .	749	0	0
FINN, Charleville (accepted) . . . . .	667	0	0
Engineer's estimate . . . . .	660	0	0

## DARTMOOR.

For Erection of Dwelling-house at Princetown, Dartmoor, near Horrbridge, Devon, for Mr. A. Rowe. Mr. JAS. HARVEY, M.S.A., Architect, Plymouth. Quantities supplied.

A. R. LETHBRIDGE & SON, Plymouth (accepted) . . . . .	£753	0	0
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## FARNHAM.

For Building Police Station, Farnham. Mr. C. H. HOWELL, Architect.

Harris & Sons . . . . .	£3,127	0	0
Colls & Sons . . . . .	3,030	0	0
Leslie & Co. . . . .	2,995	0	0
W. Johnson . . . . .	2,960	0	0
Goddard & Sons, Farnham . . . . .	2,850	0	0
TOMPSETT & KINGHAM, Farnham (accepted) . . . . .	2,700	0	0

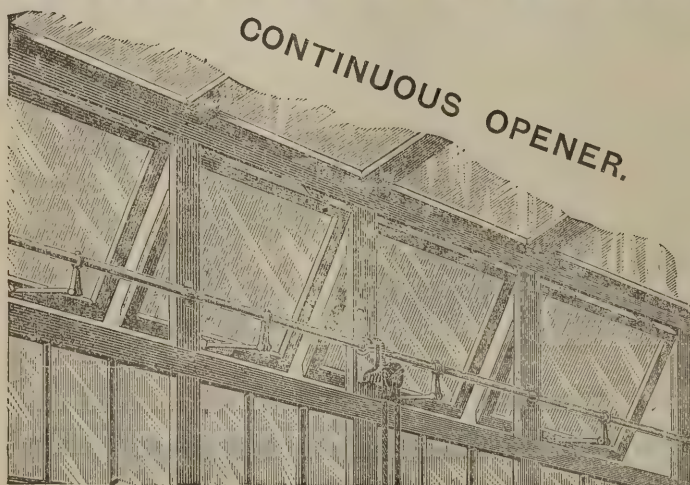
## Caterham Police Station.

Colls & Sons . . . . .	2,427	0	0
Goddard & Sons . . . . .	2,337	0	0
Ward . . . . .	2,320	0	0
Leslie & Co. . . . .	2,295	0	0
W. Johnson . . . . .	2,291	0	0
Taylor . . . . .	2,270	0	0

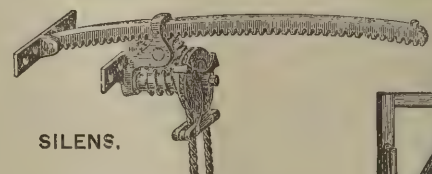
## CONTRACTORS TO H.M. GOVERNMENT.

INTERNATIONAL HEALTH AND OTHER EXHIBITIONS—MEDALS AWARDED FOR

## LEGGOTT'S PATENT ADJUSTMENT



CONTINUOUS OPENER.



SILENS.

THE SILENS, for Fanlights, Skylights, &c. Is admitted to be the best ever put before the Public. Can be adapted to any kind of window. Size and height of window no object.

From 4/3 each.

The WILMOS is worked with a rod or endless cord. It is extremely neat, and can be fixed to open either top or bottom, inwards or outwards; no cutting away of frame required. When worked with a rod is most efficient for Public Buildings, as the key can be loose. For Price Lists, Illustrations, and Testimonials, write as below.

For Continuous and other Lights, Estimates given.



WILMOS.

NO CUTTING AWAY OF FRAME REQUIRED.

## TESTIMONIAL.

SIRS,—I have pleasure in testifying that I have used Leggott's Silens Adjustments for various buildings to high skylights, fanlights, and top parts of windows, and in every case they gave satisfaction.

They are secure in whatever position, whether the window is open or closed, and are quite simple and workable in their action. I prefer them to any other that I have seen or used for the above-mentioned purposes.

Messrs. W. & R. LEGGOTT, Bradford.

I remain, yours obediently,

R. DAVIES, Architect.

BANGOR: N. Wales: Sept. 14, 1885.

Considerably Reduced Price List, November 1, 1887.

ALL WORK ENTRUSTED TO US GUARANTEED SATISFACTORY.

W. & R. LEGGOTT, General Brass and Ironfounders and Finishers, Makers of Patents and Specialities,  
235 HIGH HOLBORN, LONDON, W.C.;  
109 HOPE STREET, GLASGOW; SILENS WORKS, BRADFORD.

TELEGRAPHIC ADDRESS—"SILENS BRADFORD."



ESTON.

For Construction of Main Sewer, South Bank, Eston. Mr. W. STAINTHORPE, District Surveyor.		
J. T. Dixon, Preston-on-Tees	£864	15 9
I. Atkinson, Eston	861	19 0
J. Hope, Stockton-on-Tees	776	8 5
W. Ginger, Middlesbrough	694	10 0
G. MARSHALL, Darlington (accepted)	693	4 0
Surveyor's estimate	876	13 9

FLAMBOROUGH.

For Wesleyan Chapel and School, Flamborough. Mr. J. EARNSHAW, M.S.A., Architect, Wellington Road, Bridlington Quay.		
Rennard, Bridlington Quay	£2,250	0 0
Mainprize, Bridlington Quay	1,950	0 0
Good, Hull	1,840	0 0
Bailey, Bridlington Quay	1,800	0 0
GRAY, Bridlington Quay (accepted)	1,450	0 0
Fell, Scarborough	1,407	0 0

GORE FARM.

For Engineering Work in connection with the new Hospital for Convalescing Small-pox Patients, Gore Farm, near Dartford, Kent, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. No quantities.		
Sugg & Co. (Limited)	£8,490	0 0
Bailey & Grundy	7,920	0 0
Clement, Jeakes & Co.	6,828	0 0
Goddard, Massey & Warner	6,643	0 0
Fraser & Fraser	6,397	0 0
Bradford & Co.	6,310	0 0
W. J. Fraser & Co.	6,290	0 0
Watford Engineering Works	5,885	0 0
Summerscales & Son	5,876	0 0
F. Bird & Co.	5,800	0 0
Stidder, Davis & Co.	5,771	0 0
Easton & Anderson	5,710	0 0
Jenkins & Son	5,500	0 0
Porter & Co.	5,465	0 0
G. & F. May	5,400	0 0
BENHAM & SON, Wigmore St., W. (accepted)	5,250	0 0

HERTFORD.

For Construction of Flood Gates and Overflow Weir, and Repairs to Sluices and River Banks, River Beane above Molewood Mill, Bengoe. Mr. RUSSELL AUSTIN, Engineer, 11 Fore Street, Hertford.		
W. Gray, Hertford Heath	£531	2 0
G. Bell, Tottenham	505	11 0
J. CORK, Spalding (accepted)	481	0 0
For Construction of Stoneware Pipe Outfall Sewer (700 yards) with Manholes, Ventilators, Flushing Tank, Sewage Outfall Tank, Little Amwell. Mr. RUSSELL AUSTIN, Engineer.		
J. Cork, Spalding	£741	0 0
G. Bell, Tottenham	634	0 0
G. R. Rackham & Co., Colchester	593	0 0
T. ADAMS, Kingsland (accepted)	583	5 0

LEICESTER.

For Works in connection with the Cutting of a New Canal and River Channel, and Widening and Deepening the Union Canal, the making of Wharves, New Roads, &c., for the Flood Works Committee of the Corporation of Leicester. Plans, Specification, and Quantities by the Borough Surveyor, Mr. J. GORDON, M.Inst.C.E.		
W. Webster, London	£59,519	0 0
G. Parkinson, Manchester	49,050	10 0
S. Pearson & Sons, London	45,248	17 2
Whitaker Bros., Leeds	39,842	17 10
Holme & King, Liverpool	39,285	8 7
L. Foster, Radcliff-on-Trent	37,632	7 2
G. Bell, London	36,754	4 8
J. Dickson, St. Albans	35,210	19 10
J. Evans, Ealing	34,251	9 6
J. Biggs, Birmingham	33,995	10 3
E. TEMPEST, Leicester (accepted)	31,973	11 9
For Building Boot and Shoe Warehouse, for Messrs. A. Tyler & Sons, Leicester. Mr. JAMES FRANK SMITH, Architect. Quantities by Architect.		
Tyers & Yates	£1,820	0 0
Duxbury & Son	1,780	0 0
Mason	1,722	0 0
T. Bland	1,720	0 0
J. F. Price, Nottingham	1,715	0 0
H. Bland	1,660	0 0
T. Hutchinson	1,655	0 0
Clark & Garrett	1,653	0 0

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Unrivalled for Quality, Colour, and Durability.

Highest Award, Gold Medal from the International Exhibition, London, 1882.

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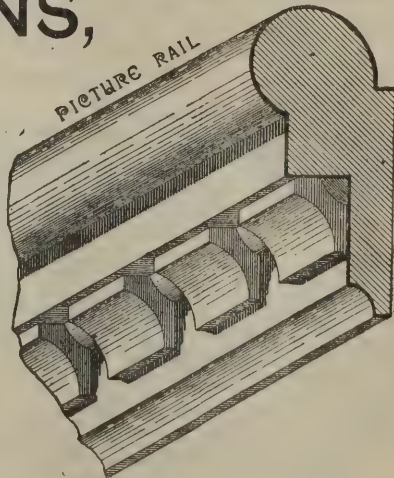
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## JOHN EEDE BUTT & SONS,

### ENRICHED MOULDINGS.

"Clean and smooth workmanship. . . . Well suited for architectural purposes. . . . Great scope for originality in ornamental treatment, because of the variety of design that can be applied to architects' sections."—*The Architect*.

YELLOW DEAL,  
PITCH PINE,  
KAWRIE PINE,  
OAK,  
WALNUT,  
MAHOGANY,  
&c.



STEAM MOULDING WORKS,  
BRIGHTON & LITTLEHAMPTON.



## LEYTONSTONE.

For Extension of Wesleyan Methodist School and Chapel,  
Leytonstone. Mr. GEORGE BAINES, Architect, 4 Great  
Winchester Street, E.C.

## Extension of Church.

S. J. Scott	£859	0	0
North Bros.	808	0	0
H. L. Holloway	760	0	0
F. & H. F. Higgs	740	0	0
J. Catley	727	0	0
J. Hearle & Son	700	0	0
George J. Hosking	690	0	0
George Dobson	690	0	0
R. G. Battley	676	0	0
James Morter	671	0	0
F. J. COXHEAD (accepted)	563	18	6

## School.

F. & H. F. Higgs	2,998	0	0
J. Catley	2,899	0	0
H. L. Holloway	2,874	0	0
J. Hearle & Son	2,770	0	0
George J. Hosking	2,759	0	0
R. G. Battley	2,722	0	0
S. J. Scott	2,721	0	0
James Morter	2,705	0	0
George Dobson	2,635	0	0
North Bros.	2,588	0	0
F. J. COXHEAD (accepted)	2,369	7	0

## Infants' Room and Kitchen, &amp;c.

R. G. Battley	546	0	0
F. & H. F. Higgs	439	0	0
J. Hearle & Son	420	0	0
George J. Hosking	410	0	0
J. Catley	399	0	0
James Morter	398	0	0
H. L. Holloway	393	0	0
North Bros.	390	0	0
S. J. Scott	369	0	0
George Dobson	363	0	0
F. J. Coxhead	346	15	0

## Library, Church Parlour, Vestry, &amp;c.

H. L. Holloway	£670	0	0
F. & H. F. Higgs	630	0	0
J. Catley	620	0	0
J. Hearle & Son	607	0	0
George J. Hosking	597	0	0
North Bros.	595	0	0
James Morter	585	0	0
R. G. Battley	575	0	0
S. J. Scott	553	0	0
F. J. Coxhead	536	15	0
George Dobson	530	0	0

## Boundary Wall, Fence, and Gates.

R. G. Battley	110	0	0
North Bros.	106	0	0
S. J. Scott	105	0	0
F. & H. F. Higgs	86	0	0
H. L. Holloway	83	0	0
George Dobson	80	0	0
F. J. Coxhead	76	7	0
J. Hearle & Son	75	0	0
George J. Hosking	73	0	0
James Morter	70	0	0
J. Catley	69	0	0

## LONDON.

For New Stabling and Dwellings, &c., at St. Helena Gardens,  
Rotherhithe, for Mr. E. W. Robinson. Mr. J. W. STEVENS,  
Architect and Surveyor, No. 21 New Bridge Street, E.C.

W. A. Rhodes, Kensington	£1,580	0	0
W. & H. Castle, Southwark	1,370	0	0
J. T. Peppiatt, Hoxton	1,235	0	0
S. Chafen, Rotherhithe	1,195	0	0
Prestige & Co., Pimlico	1,185	0	0
A. White & Co., Rotherhithe	989	0	0

For Building Shop and Premises, Blackfriars. Mr. THOMAS

F. SHAW, Architect, Harlesden, N.W.			
W. H. Ashford & Co., Kensington	£1,780	0	0
F. Farrant, Camberwell	1,454	0	0
W. Oldrey & Co., Westbourne Park	1,379	0	0
Ward, Clark & Co., New Cross Road	1,333	0	0
G. Parker, Peckham	1,325	0	0
Holloway Bros., Battersea	1,311	0	0
Chiswell, Brixton	1,230	0	0
Hollingsworth, Peckham	1,220	0	0
BALAAM BROS., Old Kent Road (accepted)	1,150	0	0

## HOLDEN &amp; CO.'S ZINC &amp; COPPER ROOFING

UPON THEIR PATENT AND IMPROVED PRINCIPLES,

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## H. W. COOPER &amp; COMPANY, LIMITED,

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Manufacturers of Cooper's Glass, Revolving, Circular, and Sliding  
Ventilators (H. W. Cooper, Sole Inventor).

Improved Glass Louvre and Venetian Ventilators, for Private and Public Buildings, Churches,  
Halls, and lights of every description. Improved Iron, Copper, Brass, and Gun-Metal Casements,  
New Hopper Ventilators for Skylights, &c. Medal awarded to H. W. Cooper from Glass Sellers'  
Company Exhibition, London, 1876. Diploma of Merit, Sanitary Institute of Great Britain  
Exhibition, Glasgow, 1883. Diploma of Merit, National Health Society Exhibition, London, 1883.  
H. W. COOPER, Sole Inventor of the Circular and Sliding Ventilators;  
also of the Metal Casements and Hopper Ventilators.

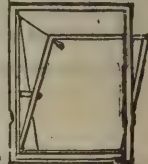
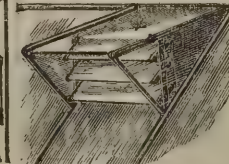
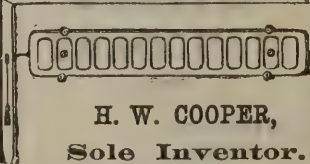
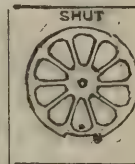
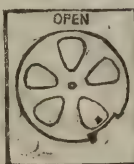
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MEDAL AWARDED, 1876.



Improved Casement. Circular Glass Revolving Ventilator.

H. W. COOPER,  
Sole Inventor.

Glass Sliding Ventilator.

Improved Hopper for Skylights.

Hopper Ventilator.

Casement.

Steam Works: Little Queen St., Upper  
George Street, Edgware Road, W.

Office: 28a UPPER GEORGE STREET,  
EDGWARE ROAD, W.



LONDON—continued.

For Building St. Columb's Mission Church, Notting Hill, for the Rev. Canon Trench. Mr. E. P. LOFTUS BROCK, F.S.A., Architect.

Sabey & Co.	£1,690	0	0
Avis & Co.	1,670	0	0
Batchelor	1,620	0	0
Mattock Bros.	1,597	0	0
Dove Bros.	1,575	0	0
Phillips & Son	1,570	0	0
Oldrey & Co.	1,527	0	0
Peters	1,520	0	0
Naylor	1,493	0	0
Allen & Sons	1,395	0	0
Kynoch & Co.	1,395	0	0

For Rebuilding Nos. 117, 119, and 121 Newington Causeway, and Four Houses in Rockingham Street, S.E. Mr. F. A. POWELL, Architect, 200 Kennington Park Road, S.E.

Gregory & Co.	£6,241	0	0
J. Tyreman	6,203	0	0
W. Smith	6,169	0	0
Holliday & Greenwood	6,140	0	0
W. Downs	6,003	0	0
Burman & Sons	5,951	0	0
A. White & Co.	5,769	0	0
W. & F. CROAKER (accepted)	5,463	0	0
W. & H. Castle	5,462	0	0

For Construction of 2,200 feet Pipe Sewers, with Manholes, Ventilators, Gullies, &c., for the Plumstead Board of Works. Mr. W. G. FORDER, Surveyor.

Burrill, Little Ilford	£1,435	0	0
West, Deptford	834	0	0
G. Neal & Co., Wandsworth	768	0	0
Rogers, Notting Hill	710	0	0
Woodham & Fry, Greenwich	675	0	0
Farmar & Gregory, Plumstead	656	0	0
G. Bell, Tottenham	600	0	0
Cattley, London	598	0	0
Rackham & Co., Colchester	577	0	0
Surveyor's estimate	550	0	0

For Decorations to Staircase and Reception-rooms at No. 2 Mansfield Street, for Mr. Morris. C. HINDLEY & SONS, Oxford Street (accepted).

LONDON—continued.

For Construction of Foundations of Proposed New General Post Office North, St. Martin's-le-Grand, E.C.

Shillitoe & Son	£39,838	0	0
Pearson & Son	39,682	0	0
W. Webster	39,670	0	0
Armitage & Hodgson	38,635	0	0
G. Bell	37,690	0	0
Holme & King	36,353	0	0
Stephens, Bastow & Co.	35,977	0	0
Kirk, Knight & Co.	35,900	0	0
P. H. Dawes	35,830	0	0
W. Stubb	35,693	0	0
Martin, Wells & Co.	35,000	0	0
S. & W. Pattinson	34,725	0	0
Killby & Gayford	34,300	0	0
Mowlem & Co.	33,890	0	0
Higgs & Hill	33,840	0	0
A. J. Beaven	33,500	0	0
Perry & Co.	32,987	0	0
M. Gentry	32,675	0	0
Lawrence & Sons	32,250	0	0
J. T. Chappell	32,243	0	0
H. Lovatt	31,995	0	0
Kirk & Randall	31,764	0	0
N. Fortescue	31,051	0	0
BRASS & SON (accepted)	29,555	0	0

For Repairs, Alterations and Renovation of the Town Hall, Old Street, E.C., for the Vestry of St. Leonard, Shoreditch.

W. Bax, Highbury	£1,331	9	6
T. Winter & Co., Brixton	1,250	0	0
W. Thomason & Son, Hackney Road	1,025	0	0
H. Foulger, Kingsland Road	929	10	0
Barrett & Powell, Hackney	915	0	0
H. Chubb, Southgate Road	877	10	0
G. Flaxman, Southgate Road	860	0	0
J. W. Sawyer, Clapham Road	845	0	0
C. J. Sherwood, Leytonstone Road	845	0	0
C. A. Heinneman, Balham	841	14	0
Crow & Sylvester, Chiswell Street	790	0	0
W. G. Lilley, Pall Mall	737	0	0
Ellis & Turner, Aldersgate Street	700	0	0
Shearing & Co., South Kensington	658	0	0
G. Foxley, Regent Street	523	0	0
W. DUDLEY, New Southgate (accepted)	493	0	0

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## HYDRAULIC RELIANCE

(STEVENS & MAJOR'S PATENT).

LOW PRESSURE,  
HIGH PRESSURE,  
HORIZONTAL CYLINDERS  
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VERTICAL CYLINDERS.

May be seen at Walsingham House, Marlborough Mansions, St. Ermin's Mansions, Meistersingers' Club, Prince's Chambers, Arundel Hotel, The Hummums Hotel, Surrey and Mowbray Houses, Cromwell Mansions, Civil Service Co-operative Society's Stores, &c., &c., London; Mont Dore Hotel, Bournemouth; Imperial Hotel, Liverpool, &c., &c.

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# ARCHD. SMITH & STEVENS,

QUEEN'S ROAD, BATTERSEA.



## LONDON—continued.

For Building Stables for Fifty Horses, with House, Office, &c., for the Fulham Vestry. Mr. JAMES G. NORRINGTON, Architect. Quantities by Mr. F. H. Hardcastle.

Temple & Graham, Fulham	£7,200	0	0
Longley, Crawley	6,965	0	0
Henly & Co., Moorgate Street	6,924	0	0
Woodhouse, Woodford	6,576	0	0
Foster & Dicksee, Rugby	6,333	0	0
Voller, Wood Green	6,320	0	0
Higgs & Co., Loughborough Junction	6,250	0	0
Richardson, Peckham	5,919	0	0
Ashfold & Co. Fulham	5,580	0	0
T. Nye, Ealing	5,417	0	0
A. Brickell, Fulham	5,249	0	0
A. R. Flew & Co., West Kensington	5,158	0	0

For Steam-heating Apparatus for the Wards of Chelsea Infirmary, Cale Street, Chelsea, for the Guardians. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. No quantities.

Clements, Jeakes & Co.	£1,055	0	0
R. Crane	988	0	0
Bradford & Co.	981	0	0
J. F. May	891	10	0
Benham & Son	882	0	0
Summerscales & Son	877	0	0
POTTER & SON, South Molton Street, W. (accepted)	862	0	0

For Alterations and Shop Fittings at No. 80 Queen's Road, Bayswater, for Mr. Edwin P. Joyce, of No. 354 High Road, Kilburn, N.W. Mr. WILLIAM A. BURR, M.S.A., Architect, 65 Chancery Lane, W.C.

Bray & Pope	£329	0	0
Young & Co.	299	0	0
Larke & Son	296	0	0
STEVENS BROS. (accepted)	257	10	0

## MONMOUTH.

For Erecting a Market Cross in St. Thomas's Square, Monmouth, for Mr. Charles H. Crompton-Roberts. Mr. F. A. POWELL, Architect, 200 Kennington Park Road, S.E.

H. WALL (accepted)	£70	0	0
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## MONMOUTH—continued.

For Addition to Hospital, Monmouth. Mr. F. A. POWELL, Architect, 200 Kennington Park Road, S.E.

Simmons	£185	0	0
C. Morgan	160	0	0
D. Roberts	144	0	0

## ROMFORD.

For Sanitary Fittings and Drainage Works at the Romford Workhouse. Mr. C. J. DAWSON, Architect, Barking.

R. P. Beattie, Pimlico	£1,341	0	0
Dover, Wood & Co., Stamford Hill	1,015	15	0
W. Roscoe, 27 York Street, W.	982	8	6
C. Lewis, Witham	846	14	6
D. Argent, Barking	786	0	0
J. Drake, Barking	712	16	0
W. WATSON, Ilford (accepted)	680	0	0

## ROTHERFIELD.

For Building Cottage at Rockingham, Rotherfield. Mr. TEULON, Architect.

Edwards, Tunbridge Wells	£348	0	0
Wickens, Crowborough	269	0	0
Moon & Son, Rotherfield	215	0	0
Ralph	210	0	0
H. Harman	200	0	0

## SHEFFIELD.

For Works required in Connection with the Manor School, for the Sheffield School Board. Messrs. WIGHTMAN & WIGHTMAN, Architects, Sheffield.

J. Robertson, Sheffield	£1,800	10	0
J. Morton, Sheffield	1,799	0	0
J. Spink, Sheffield	1,730	0	0
W. Bisset & Sons, Sheffield	1,695	0	0
J. Chambers & Son, Sheffield	1,682	0	0
G. Longden & Sons, Sheffield	1,680	0	0
J. Holmes, Sheffield	1,564	10	0
J. Wilson, West Retford	1,560	0	0
M. Davison, Sheffield	1,540	11	0
C. Chadwick, Sheffield	1,539	0	0
Ash, Low & Biggin, Sheffield	1,490	0	0
J. Harrison, Sheffield	1,379	0	0
J. LISTER, Aston, Rotherham (accepted)	1,420	0	0

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For the Erection of Church Institute, Twickenham. Messrs. GEORGE LANSDOWN & HARRISS, Architects, Warwick Street, Charing Cross.

Messom . . . . £1,662 0 0  
W. Downs . . . . 1,660 0 0  
Lane . . . . 1,589 0 0  
H. & E. Lea . . . . 1,554 0 0  
Oldridge . . . . 1,511 0 0  
I. Tyerman . . . . 1,470 0 0  
I. F. COLLINSON (accepted) . . . . 1,408 0 0

WIGAN.

For Building Sanatorium, Wigan.

W. Knowles, Wigan . . . . £3,955 0 0  
D. A. Ablett, Wigan . . . . 3,775 0 0  
J. Preston, Wigan . . . . 3,596 0 0  
W. WINNARD, Wigan (accepted) . . . . 3,571 0 0

YARMOUTH.

For Alterations and Additions to Board School, Northgate, Great Yarmouth. Messrs. BOTTLE & OLLEY, Architects, Yarmouth.

J. P. Knights, Yarmouth . . . . £3,145 0 0  
R. Davy, Yarmouth . . . . 2,878 0 0  
R. Kemp, Gorleston . . . . 2,842 0 0  
G. H. Springall, Yarmouth . . . . 2,780 0 0  
Cork & Beech, Yarmouth . . . . 2,666 0 0  
J. Leggett, Yarmouth . . . . 2,595 0 0  
T. Howes, Yarmouth . . . . 2,584 0 0  
Rand & Cooper, Yarmouth . . . . 2,569 0 0  
Grimble & Walls, Yarmouth . . . . 2,520 0 0  
G. S. Cooper, Yarmouth . . . . 2,475 0 0  
R. Eastoe, Yarmouth . . . . 2,444 0 0  
T. G. Leggett, Gorleston . . . . 2,443 0 0  
J. H. HAWES, Yarmouth (accepted) . . . . 2,440 0 0  
J. F. Bray, Yarmouth . . . . 2,184 0 0

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For Construction of Roads and Sewers on the Cottage Estate, Wellingborough. Mr. E. SHARMAN, Surveyor, Wellingborough.

Clayson Bros., Cogenhoe . . . . £595 0 0  
R. Marriott, Wellingborough . . . . 409 0 0  
G. Henson, Wellingborough . . . . 400 0 0  
T. Wilmott, Rushden . . . . 390 0 0

TRADE NOTES.

MR. E. H. SHORLAND, of Manchester and London, has just supplied his patent Manchester grates and stoves to the new Catholic schools, Normanton, Mr. E. Simpson, of Bradford, being the architect.

IT is proposed to construct an open swimming-bath, about 90 feet long and 60 feet wide, in the Ivy House Recreation Ground, Leeds.

MR. FENWICK, C.E., of Leeds, the arbitrator in cases of land taken by the Halifax High-level Railway Company, has awarded 1,738*l.* to Messrs. Henry and Walter Holroyd Oates, the amount claimed being 3,500*l.*; and 1,018*l.* to Mr. Henry Oates, whose claim was 1,350*l.*

A MEETING of the Midland Iron and Steel Wages Board was held in Birmingham on Monday, when it was resolved to re-establish the sliding scale on the basis of the inclusion of all classes of iron, except charcoal-iron, according to the prices ascertained from the books of twelve mutually-selected firms instead of on the price of bar iron only, as formerly. The question of an advance of wages asked for by the operatives, it was decided should be submitted to arbitration.

THE *Halifax Courier* says that since the beginning of 1886, the Sowerby Bridge Local Board have passed 139 plans of houses, all of which have been erected, or are rapidly progressing toward completion. Several were in blocks of from four or five to twice that number, and in three instances the lots exceeded a score, and the rate of increase is being maintained; arrangements are being made for commencing another block of twenty-one in the upper part of Tuel Lane, in which direction extension has been marked of late years. At

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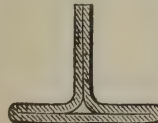
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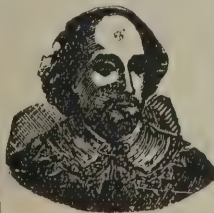
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Sowerby New Road, also, masons, joiners, and plasterers have long been busily employed, and the erection of a further block of six dwellings will shortly be entered upon there. These works are all the result of private speculation and individual enterprise, apart from the operations of the local building companies, who own a good deal of land for future development.

THE Leith Town Council, at a special meeting last week, approved of the Water of Leith Drainage Scheme adopted by the joint committee of the Corporations of Edinburgh and Leith. The cost of carrying out the scheme is estimated at about 65,000/.

ON Friday last the Stratford-on-Avon Rural Sanitary Authority decided to call in Mr. E. Willcox, C.E., of Colmore Row, Birmingham, to report on the means of obtaining an adequate water supply for Kineton.

AT the fortnightly meeting of the East Cowes Local Board a letter was read from Mr. J. Meader, of West Cowes, stating he was at a loss for a reason for their not accepting his tender for constructing the sewers at Adelaide Grove, and the outfall, his being the lowest tender, and, as he was a large ratepayer in the town, he thought it was very unfair. The business of the meeting was then proceeded with.

AN important public scheme was initiated on Friday in Bilbao, to construct an outside harbour, or secondary port, at the entrance of the river Nervion, to be known as the port of Abra. The effect will be to supersede the existing dangerous entrance to the river, an open bar, which, especially with north-west winds, renders Bilbao one of the most dangerous and difficult ports on the Atlantic coast. The principal breakwater or mole is to start from the coast to the north-west of the small fishing village of Santurce, extending 1,000 metres across the bay towards Al Gorta, from which point it takes a southerly direction towards the entrance of the Bilbao river, extending about 500 metres in this direction. On the opposite coast a second breakwater, starting south of Al Gorta, extends in a westerly direction, 750 metres towards the first, but some 500 metres nearer the mouth of the river, the space between the two piers being 640 metres for the passage of vessels. The works are from the designs of the Spanish engineer Churrua; but these appear practically not dissimilar from those proposed some fifteen years ago by the English engineers, Sir John Cooke and Mr. Vignoles. The estimated cost of the works is thirty millions of pesetas, and they are to be completed in twelve years.

The Chertsey Rural Sanitary Board have adopted a report from the Weybridge Drainage Committee, recommending a system of drainage for Weybridge and Oatlands, to be carried out by Mr. R. P. Birch, C.E., at a cost of 15,000/.

THROUGH the liberality of an influential member of the Old Meeting Church, Birmingham, an important addition has been made to the interior of the building by the erection of a handsome oak reredos and side wings. The centre portion, or reredos proper, is divided into five panels by buttresses of a bold character, terminating above the structure in crocketed pinnacles. The panels thus formed are filled by recessed and moulded arches, with gables above supported by columns with carved caps, the space between the arches and gables being filled with carved spandrels and tracery. Three of the panels are further enriched by having the background gilded and illuminated with suitable texts, the smaller panels between being filled by a carved scroll cut in very high relief. The side wings, which run to the north and south walls of chancel, form an arcading with traceried panels, being finished along the top by a carved and moulded capping. The work has been carried out in a thoroughly artistic manner by Messrs. Jones & Willis, of Birmingham and London.

THE contract for the extension of the Ardwick and Ancoats Hospital has been let to Messrs. Neill, of Manchester. The cost of the new wing will be between 11,000/ and 12,000/.

A LARGE turret-clock, with Westminster chimes and four automaton figures, with fine bells, has been erected at the American Markets, Cardiff. It is a first-class clock, and was made at the works of Messrs. William Potts & Sons, clock manufacturers, Guildford and Cookridge Streets, Leeds, from the designs and plans of Lord Grimthorpe (formerly Sir E. Beckett, Bart., Q.C.), all whose latest improvements have been inserted, namely, the double three-legged gravity escapement, maintaining power, compensation pendulum, horizontal cast-iron bed frame planed perfectly flat, and all the bearings being of gun metal, screwed into the frame; the time is shown on a large external dial, with the hands, figures, and minutes gilt. The figures, which are life-size, represent an incident in Sir Walter Scott's "Ivanhoe." The centre figures represent Friar Tuck and Richard Cœur-de-Lion, who strike the hours alternately. The quarters are struck by Robin Hood and Gurth, the swineherd, at whose feet is a boar; there are four bells for the Westminster quarters, and one large bell in the centre for hours. The clocks, bells, and figures will no doubt

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form a great source of attraction in the town, as well as being a very useful ornament. The clocks at the Imperial Arcade, Birmingham, and Thornton's Arcade, Leeds, were made and fixed by the same firm. Mr. Richards, of Cardiff, is the architect for the markets.

At a meeting of the Barnsley Town Council on Tuesday there was laid before the Council the draft of an additional agreement with Mrs. Lambert, who had already promised by agreement to give 3,500*l.* for the erection of a hospital, by which that lady promises to give an additional 1,500*l.*, making a total of 5,000*l.*, which she has given for the erection of a fever hospital in Barnsley. The Corporation are to provide a site for the proposed hospital within six months, or the agreements lapse. It was stated that an arrangement to purchase the site had already been made, and only the consent of the Ecclesiastical Commissioners to the sale was needed to complete the transaction. A special meeting of the Corporation will be held, if necessary, to consider the plans for the proposed hospital, which will be built on land at present belonging to the rector of Darfield, at Measborough Dyke.

CONSIDERABLE additions have been made to the Eastern Counties Asylum, Colchester, the ventilation of which is carried out on the Boyle system, the vitiated air being extracted by the latest improved form of the self-acting air-pump ventilator.

THE Perth Town Council on Monday decided to claim 2,000*l.* from the Gas Commission for 1½ acres of ground at the Shore, to be given to the latter in connection with the erection of a new gas-meter, and for wayleave through the South Inch.

At the meeting of the Commissioners of Sewers on Tuesday at the Guildhall, a letter was read from the city architect stating that the whole of the property on the east side of Duke Street, Aldgate, had been rebuilt to the new line of frontage, and that the Commissioners might therefore take possession of the ground between the old and new line of frontage for the purpose of widening and repairing it. Relative to the suggested provision of a subway at the crossing of Queen Victoria Street, in front of the Mansion House railway station, the Streets Committee reported that the Commission had no power to make it, but would assist the railway company to obtain Parliamentary power for the purpose.

THE sixty-sixth session of the Birkbeck Literary and Scientific Institution will open on Monday next. Nearly two hundred classes meet weekly in commercial and technical subjects, mathematics, natural, applied, and mental science,

languages, history, literature, art, music, law, &c., &c. Special classes are arranged for university, Civil Service, and other examinations. The classes are open to both sexes. During the past session the students have gained great success at various competitions, and the prizes obtained will be distributed by H.R.H. the Duchess of Albany, in November next. On Wednesday evenings the usual lectures will be delivered in the large theatre of the institution. Amongst those who are already engaged may be mentioned Sir Robert S. Ball, Mr. Harry Furniss, Mr. Samuel Brandram, Mr. Max O'Rell, Mr. Charles Dickens, Professor Morley, Mr. J. T. Carrodus, Mr. Fred Villiers, and Mr. John Thomas.

A PLOT of ground at Folkestone, which the Government proposed to sell for 700*l.* for a Jubilee hospital site, was sold by auction for 3,425*l.* on Tuesday.

WE have received a copy of the first volume of the new series of the *Electrical Engineer*. This publication is invaluable to all interested in electrical engineering, by its record of the steps that are continually being made in the practical application of electricity as a servant-of-all-work in so many directions. It will, moreover, prove most useful in the library for reference as a history of the progress and practice of electric science. In addition, it contains excellent engravings and portraits of notable men.

COAL has been found at Cotwall End, between Sedgley and Himley, and already shafts are being sunk. The borings, it is stated, prove the coal to be of excellent quality, and likely to be of the ordinary thickness of the South Staffordshire seam, viz., 10-yard thick coal.

The Bristol Docks Board have just completed building an enormous granary on Canon's Marsh. The building will accommodate over 60,000 quarters of wheat, and its construction, together with the machinery, has entailed an expenditure of just 60,000*l.* The machinery is of an elaborate character, and when worked at its utmost capacity is capable of receiving and delivering about 300 tons per hour. There are four elevators capable of lifting 75 tons per hour, and the four can be worked at the same time.

THE freehold land and buildings at Soho, Birmingham, known as the Woodford Ironworks, lately in the occupation of Messrs. Morewood & Co., with the roofing and nail-sheet plant with which they were not many years ago fitted up, and which was advertised as being able to turn out 250 tons of sheets weekly, have been disposed of by auction for 23,500*l.* It

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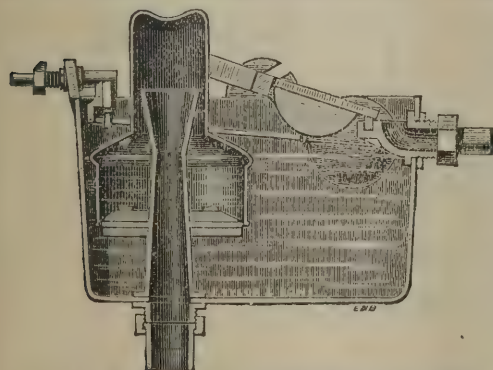
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THE CHIEF ADVANTAGES are—(1) the direct-acting method of charging the siphon, by which the full flush is obtained at once; (2) simplicity of construction; (3) no valve in the bottom of the cistern to cause leakage; (4) no tight-fitting parts to corrode or get out of order; (5) no waste incurred by fastening the "pull"; (6) insures a rapid and regulated flush without holding down the pull.

SOLE MAKERS—

PRICES AND PARTICULARS ON APPLICATION.

## J. TYLOR & SONS.

SANITARY AND HYDRAULIC ENGINEERS AND BRASSFOUNDERS,  
2 NEWGATE STREET, LONDON, E.C.



includes three pairs of 120-horse horizontal condensing engines by Davy Bros. & Withinshaw, five small engines, six pumps, sixteen boilers, four patent economisers, one 22-inch forge-train, seven 22-inch sheet-mills, two three-ton shingling hammers, thirteen pairs of powerful steam-bar, cropping and sheet shears, weighing-machines, overhead traveller, eight gas-producing puddling furnaces, three ball-furnaces, ten heating and gas-producing furnaces, nine annealing-furnaces. The building embraces a sheet-warehouse, a lathe-shop and dynamo-house, a range of smiths' and millwrights' shops, a fitting-shop, a foundry and the necessary offices and other stores. The land is 6 acres in extent. The works were purchased for the purpose of selling them again in lots.

A SUM of 250*l.* is to be spent on improving the bells of the old thirteenth-century parish church of Wilmslow.

THE *Tyldesley Chronicle* says:—Mr. and Mrs. John Grundy of Tyldesley, had again their "family party" of the old folks of Tyldesley on Wednesday evening, when the proceedings passed off as pleasantly and happily as usual on these interesting occasions. Like the township of Tyldesley itself, the "family" seems to increase in number or size each succeeding year, as there were over 600 who were on this occasion the recipients of Mr. Grundy's bounty. Mr. Caleb Wright occupied the chair, and his appropriate opening remarks gave the key to the speeches which followed, the burden of which was the progress—material and moral—which had been made "since we were boys together."

At the meeting of the Court of Common Council last Friday the contract was sealed between the Corporation and Mr. W. Webster, for the construction of the southern approach to the Tower Bridge for 38,383*l.*

AN artesian tube-well is at present being bored adjoining the new reservoir at Ealing, by Messrs. Le Grand & Sutcliff, hydraulic engineers, London. After passing through 249 feet of London clay and 72 feet of Woolwich and Reading beds, chalk has just been struck at 321 feet below surface. The total depth at present penetrated is 350 feet, and already there are indications of a supply, as the water has risen up 265 feet, or to within 55 feet of the surface.

THE dedication of a new reredos in terra-cotta, the gift of Sir Henry Doulton, will take place at the parish church of St Mary, adjoining the Archbishop's Palace, Lambeth, in conjunction with the Harvest Festival to-day. The design of the reredos is by Mr. J. Oldrid Scott.

#### A NEW DEPARTURE.

ARCHITECTS will readily admit the difficulties experienced in specifying the various materials and fittings used in building, amongst which may be mentioned the trouble in getting designs and ideas followed by manufacturers scattered all over the country; the delay in consequence, and, most important of all, the difficulty of inspection before a final specification is made. It would be a decided improvement if the architect could find a dépôt containing the specialties of the principal firms and the most modern inventions, at the manufacturers' own prices; in other words, an agency in which, directly, manufacturers would be represented.

The convenience of such a system in saving time and expense would be inestimable. The practical application of this idea originated with Messrs. S. Dixon & Son, of Leeds. The firm have had for some years the special agency for Yorkshire from the Wenham Co., Limited, and in consequence no part of the country is more thoroughly lighted. The necessity of providing showrooms for the Wenham Lamp, apart from their works, caused Messrs. S. Dixon & Son to think of extending the idea to include specialties used in every description of domestic fittings. Hence they acquired a whole block of buildings in Boar Lane, the principal commercial street in Leeds, with a splendid frontage. It is certain that no building for prominence and suitability could be found to excel it; and as to the stock within, there is not one more varied or choice to be found in the country. Messrs. S. Dixon & Son have adopted a wise plan in placing in their showrooms the very best goods that can be purchased, instead of confining themselves to individual firms. Their display of lamps, gas fittings, and chandeliers, for instance, is on this principle, for there are in this class several firms of the highest excellence, viz., Hinks & Sons, Defries & Sons, R. Winfield & Co., Hunt & Co., Messenger & Sons, R. Evered & Co., and Moore & Co., so that no visitor can fail to be suited or to have the benefit of comparison.

The wrought-iron work, of which there are a variety of beautiful specimens, is executed by Messrs. Strode & Co., London, Messrs. Verity Bros., London, and Messrs. Hoffer & Co., and consists of hall lamps, candelabras, chandeliers, brackets, &c.

The same principle of variety in manufacture applies to the stove department, which is replete with the most modern improvements in drawing- and dining-room stoves. They are

# JAS. WILLIAMSON & SON, VARNISH MANUFACTURERS, Lion Varnish Works, Lancaster.



Special Varnishes for Coach Builders.  
Special Varnishes for Railway Companies.  
Special Varnishes for Painters and Decorators.  
Special Varnishes for Cabinet Makers.  
Special Varnishes for Engineers and Machinists.  
Special Varnishes for Export to Hot Climates.  
Special Varnishes for Export to Cold Climates.  
Special Varnishes for Japanners.  
Special Varnishes for Paper Stainers.

THE ABOVE VARNISHES ARE TESTED BY PRACTICAL PERSONS BEFORE BEING SENT OUT AND THE QUALITY IS WARRANTED.

SAMPLES AND LIST FREE ON APPLICATION.



advantageously placed round the showrooms so that they can easily be inspected. The first to be noticed is a dining-room stove, with highly artistic frieze work on the newest principle, and filigree work in brass. The mantelpiece is of Brocatelle marble. The next specimen was a slow-combustion stove, with Crossthaite's patent marble canopy, fitted with Scales's fire-back, and the mantelpiece a new design in Brocatille. An imposing, massive drawing-room mantelpiece fixes our attention. It is of the St. Anne's pattern, with carved black marble panels. The frieze is 21 inches in depth, the width of the jamb is 18 inches, and the shelf is 4 inches thick. The grate is slow-combustion, and matches in elaborate design with the mantelpiece. The fender—a very massive one—gives an excellent effect. It is made of copper and brass—colours which give quite a charm to the suite. Crossthaite's patent "Union" stove, slow-combustion, the marble mantelpiece being rouge and black, is very effective. A handsome bronzed brass dining-room stove, with hand-painted tiles, set in a St. Anne's marble mantelpiece, is bright and artistic. Another very pretty stove, with copper and brass interior, is fitted with a massive rouge dining- or drawing-room mantelpiece, with black and green columns, a contrast in colour which is agreeable. A pair of Minton's panels increase the effect. The next stove is of quite new design, with copper and brass curtain work, and interior canopy, with hand-painted tile panels. The mantelpiece is appropriate, being of rouge antique and black marble. Next is a beautiful stove of best Sheffield make, with brass panels and curtain, a handsome design in copper deposited on the brass. The mantelpiece is of pure black marble, with green columns, and massive carved trusses and friezework. The shelf is 18 inches wide and 6 inches thick.

Perhaps the most elaborate and effective object in the showrooms is a magnificent mantelpiece in Italian Griotte marble, with green columns and green and black trusses, and shelves and massive black mouldings. The value of this mantelpiece is 50%, which will convey an idea of the workmanship and material. The stove is one of the best Sheffield make, with handsome brass mouldings and real bronze panels and canopy. The value of the stove is 30%. The fender is a splendid specimen of brass and real bronze, and having a massive bronze figure at each end. Space does not allow of further detail in this department. But there are many more stoves unmentioned, particularly several bedroom specimens; and what have been described will give an idea of their superior quality and the variety in design. Any modern im-

provement can be inspected in an assortment which is representative of the best work of the leading manufacturers.

A space is allotted to sanitary goods, baths and fittings, specialities manufactured by Messrs. Morrison, Ingram & Co., for whom Messrs. S. Dixon have the sole Yorkshire agency; and another to an exhibit of the Leeds patent floor-warming stoves, Wilson's gas fires, and Fletcher's fires and cookers.

Decorative work is represented by some beautiful specimens of pottery of the Burmantofts Company, Limited. Electric bells and numerous domestic appliances are also *en évidence*. We should not omit to mention a multitudinous variety of smaller domestic requisites, such as gay fire-screens, Austrian filigree work, door fittings, &c.

In nearly every instance Messrs. S. Dixon are placed, as far as price goes, in the position of the manufacturers, for they are the sole agents for Yorkshire, and all orders in that district must come through them. The firm, for instance, have the sole Yorkshire agency for the Wenham Lamp, and its popularity is so great that a special staff of skilled workmen do nothing else but fit up these lights, and success is invariable. This system of actually undertaking the work should commend itself to architects. The electric Wenham Lamp for outside lighting is a very improved light, and is now in great demand. The light and its method of application can be seen at Messrs. Dixon & Son's showrooms, or rather exhibition, for the goods are so well arranged and on a scale which few firms could emulate; so that practically Messrs. Dixons' showrooms form a permanent building exhibition.

#### REMINGTON STANDARD TYPEWRITER.

WE have received a circular descriptive of the Remington Standard Typewriter from Messrs. Wyckoff, Seamans & Benedict, of 100 Gracechurch Street, E.C. Several forms of typewriters have been invented, as is well known, but we cannot call to mind hearing much about any typewriter except the "Remington." This, it may be said, occupies the field among typewriters, as Pitman's system holds the field among processes for shorthand writing. Experts in the use of typewriters have written in detail on the merits and demerits of typewriters, and their critiques can be read by those desirous of more information. Here it is only necessary to point out that what is mainly to be looked for in such an apparatus is that it must give us the means of writing legibly with speed and with ease, and this the "Remington" does. Another

# MOORE & HUNTON,

*Wholesale and Export Cabinet Makers and Upholsterers,*

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TELEGRAPHIC ADDRESS,  
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ESTABLISHED OVER 150 YEARS.

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840.



THIRTY SHOW-ROOMS, CONTAINING THE LARGEST SELECTION OF FURNITURE IN THE TRADE.  
NEAR TO MOORGATE STREET, BROAD STREET, AND LIVERPOOL STREET TERMINI.  
NEW ILLUSTRATED CATALOGUE SENT POST FREE.



important point is that it can by no possibility bring on writer's cramp. A speed contest was held recently between the Remington Standard Typewriter and the Caligraph Writing Machine at Cincinnati, New York and Toronto, in which the Remington Standard Typewriter came off with flying colours as follows:—Remington, 97 words per minute; Caligraph, 77 words per minute. At Chicago Mr. McGurkin, being blindfolded with a handkerchief, wrote on the Remington Standard Typewriter, from new matter, from dictation, 125 words in a minute, with but three errors, the matter being properly punctuated. One of the merits of such an instrument, as is justly stated, is undoubtedly speed, but in this term should be included the important power to maintain speed, and it is eminently in this latter point that the construction of a machine tells. Foremost amongst the elements that contribute to the speed of the "Remington" machine is the compactness of its keyboard—one-half the size of the "Caligraph." The latter machine has seventy-two keys, but only fifteen of them are used in writing this particular sentence, "This is a song to fill thee with delight," and an examination of the keyboard will show that these fifteen keys are all located in the centre of the keyboard; so that a record thus attained demonstrates nothing beyond the fact that a compact keyboard is indispensable for high speed—a conclusive argument in favour of the "Remington." The difficulty that "Caligraph" operators experience in ordinary work—retaining in the mind the location of seventy-two keys, and reaching a great distance for them—was thus avoided. In the circular of the caligraph an extract is given from the *Toronto Evening News*, apropos of the contest between the "Remington" and the "Caligraph," in which it is stated that the only means by which the comparative merits of the instruments employed can be judged is, not by writing usual connected matter, but by repeating on the machine again and again a single short sentence.

#### CONSTANT WATER SUPPLY.

At the meeting of the Court of Common Council last week, the chairman of the gas and water committee, Mr. H. Mead, presented a report from his committee on the question of a constant water supply. The reference to the committee was to examine and report on the petition of the vestry of the parish of St. Giles's Without, Cripplegate, praying the Court to take the necessary steps to call upon the water companies supplying the City of London with water to make arrangements for a con-

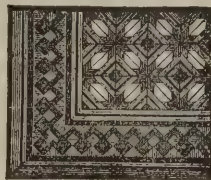
stant supply thereof. The committee communicated with the company, who expressed their willingness to confer with the special sub-committee through the company's superintendent, Mr. Collins, and the committee were subsequently attended by that gentleman, whom they heard with reference to the various details connected with a constant supply of water, and who informed them that the company were perfectly willing to give a constant supply if called upon to do so, provided the regulations prescribed by the Metropolis Water Act, 1871, were previously complied with. Mr. Collins stated that the company had lately been called upon to provide a constant supply to the parish of St. Pancras, and he estimated that an average cost of at least 5% would be incurred by each owner or occupier of premises in providing the requisite fittings, and the expense in the City, owing to its exceptional circumstances, would probably be considerably more. In addition to this, if a new lead pipe from the main to the house were required, the expense would be considerably more, and the occupier would not only have to pay this, but the expense of pulling up the pavement. The committee were also informed that in case of a constant supply being provided all existing fire-plugs would have to be removed, and it was estimated by Captain Shaw that the number of hydrants would in such case have to be doubled, involving a large expenditure. Mr. Archibald Dobbs, a gentleman who has taken a great interest in the water question, wrote to the committee stating that he felt very strongly that the citizens would regret it if the petition in favour of a constant supply were granted; and subsequently, at an interview with the committee, Mr. Dobbs expressed his opinion that if cisterns could be dispensed with a constant supply would no doubt be of advantage, but he pointed out that, although the Act does not require it, it is necessary for occupiers to retain cisterns for their own protection, so as to store sufficient water for, say, twenty-four hours' consumption. If the cistern were dispensed with, serious inconvenience would be suffered by the occupier in case of any repairs to the pipes being required, the water in such case being turned off without notice. The committee then ascertained that out of the 112 parishes of the City only 15 had expressed opinions on the subject. Of these 15 parishes 6 had sent in resolutions in favour of a constant supply, 4 against, and 4 had passed resolutions in favour of a constant supply which had not been received by the committee. Having thus obtained full information on the subject, and having given the matter every consideration, they conclude it is not expedient, in the interests of the petitioners and the

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RIGA INCH OAK FLOOR BOARDS.  
Tongued and Grooved, VERY CHEAP.  
Immense Stock always ready for Laying.



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(Turpin's Patent). 3-16 inch thick, prepared on deal back laminations, equal in wear to inch Solid Parquet. Used for Veneering old existing deal floors, and is susceptible of removal at pleasure. See Construction.

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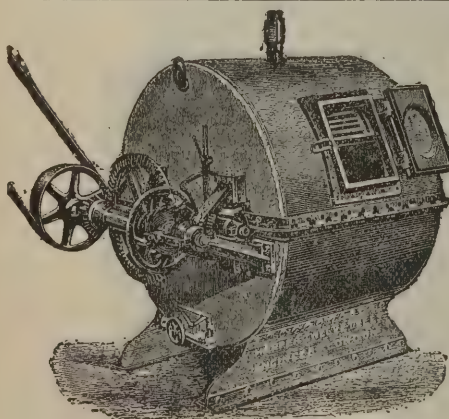
All Styles executed for the Trade at Special Rates. Skilled Artisans sent to all parts of the country.  
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ORNAMENTAL  
PARQUET.  
DEAL  
BACKING.



## HARPER TWELVETREES'

### · New System of Washing Machinery

For PUBLIC INSTITUTIONS, HOTELS, SCHOOLS, & MANSIONS,

As used in Her Majesty's Laundry, Devonport Steam Laundry, Rangoon Steam Laundry, Suez Steam Laundry, Whitechapel Infirmary, Mont Dore Hotel (Bournemouth), &c., &c.

Is specially recommended to Architects as the most perfect and economical.

Plans and Specifications for completely furnishing Hand or Steam Laundries given to Architects and Engineers; together with Prospectus of Washing, Rinsing, Boiling, Wringing, Drying and Iron Machines, Hydro-Extractors, Drying Closets, Stoves, Engines, Boilers, and all Laundry requisites.

**STEAM LAUNDRY ENGINEER,**  
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**WOOD BLOCK FLOORING.**  
**WALKER & ALLIOTT** (late of GEARY & WALKER),  
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**BLOCKS IMMOVABLE.**  
Being "Keyed" to Substructure by  
**METAL KEYS,**  
And by an  
Adhesive & Preservative Mastic  
Speciality: OAK AND DARKENED OAK.



citizens generally, to take any steps in the direction indicated. The committee add that, "It must not be lost sight of that the memorials presented to the Corporation from various vestries do not ask that the constant supply may be given to their respective parishes only, but that it may be extended to the whole of the City. Several parishes, however, having expressed opinions adverse to the system, it would be obviously unfair to apply it to the City generally, and we would suggest that, if it be decided to adopt a constant supply in the City at all, it should be applied only to those parishes which have expressed a desire for the same." Mr. Mead, in moving the adoption of the report, said that, looking at the enormous cost—estimated at 300,000*l.* or 400,000*l.*—which would be saddled upon owners in the City in making the necessary alterations of fittings, &c., they recommended that the Corporation should take no further steps in the matter. The report was adopted.

#### REGISTRATION OF PLUMBERS.

A LARGELY attended meeting of plumbers was held on Friday evening in the Burgh Court Room, Dundee, when addresses on the subject of technical education were delivered. A great number of the younger members of the craft were present. Mr. John J. Henderson, architect, presided, assisted by Professor Ewing and ex-Bailie M'Neill, and various district secretaries of the National Registration of Plumbers. Professor Ewing said that he thought the movement one of special interest, as being one initiated by the trade itself. Generally speaking, the matter of technical education had been put forward by persons outside the respective trades. But one sprung from within a trade was much more likely to succeed than one springing from without. He understood that the object of the meeting was to make a formal request that the subject of instruction for plumbers should form a portion of the course at the newly established Technical Institute at Dundee. The plumbers took the lead in this respect, and he should be surprised if the committee did not see their way to accede to their request. The establishment of classes of this kind involved two considerations—(1) the question of ways and means; (2) how they were to get teachers. As to the question of expense, he understood that the Worshipful Company of Plumbers in London had promised a grant in aid of the classes, provided an equal amount were subscribed locally.

The Clerk gave statistics of similar classes in various English towns, and at the conclusion between forty and fifty plumbers joined the classes.

#### MANCHESTER SHIP CANAL.

THE great basin which is to form the side of the locks at the Eastham Terminus has now assumed the appearance of a ravine 200 yards in width. It is computed that 1,500,000 cubic yards of earth have been moved on this section. In order to get rid of this amount of material, it has been found necessary to form what is practically new land in that vicinity. The hollows of Eastham near the shore have been filled up over an area of some acres. A large quantity of green-heart timber, a kind of larch, the most durable timber known for withstanding the action of water, has just arrived ready for the building of the great lock gates, which will be the largest in the world, excepting perhaps the gates constructed for the locks at Hull. These gates will be 80 feet wide. Three locks are to be built at Eastham abreast of each other. The smallest will be 150 feet by 30, the next 350 feet by 50, and the largest 600 feet by 80 feet. The difficult task of cutting a railway across Pool Bay is nearly completed. When finished the railway embankment will form the base of the outer wall of the canal. The number of men employed has been reduced to the winter staff, namely, 1,100, against 1,800 forming the summer staff. Nine steam navvies are constantly engaged excavating the canal for this important section.

#### WATER SUPPLY IN JAPAN.

IN a recent report, the Belgian Minister to Japan states that during the past year the Governor of Yokohama has had waterworks for that town constructed under the superintendence of General Palmer, of the Royal Engineers. In consequence of the success which has attended this undertaking, several other towns have applied for a similar water supply, and the subject is now being carefully studied. In Tokio, also, arrangements are about to be made for improving the supply, but it is not yet known whether the State will defray the prime cost or leave it to a private company. The difficulty at present consists in providing the funds, amounting to about a million sterling. The city has 1,300,000 inhabitants, and enough water

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**TUBULAR BELLS,**

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THE FINEST CATHEDRAL BELLS.

"The music of many tuneful bells, harmonious, ever changing, lending themselves to any simple air, easy of management, and mel-  
lowed as the sound of Cathedral bells. . . .  
Such music I have heard at Coventry."

PALL MALL GAZETTE, June 20, 1887.

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would have to be provided for 2,000,000. The question is a pressing one for Japanese towns, because the wells are for the most part fouled by reason of their proximity to the rice-fields. Under these circumstances, the Minister advises Belgian manufacturers to be on the alert. The Japanese Government have not adopted the system of tenders, and therefore it is necessary that agents should be on the spot, fully authorised to make proposals to the authorities, who have as yet arrived at no conclusion in respect to the further construction of waterworks. The British Consul in Yokohama, in his report, also refers to General Palmer's new supply for that town. The intake is about 25½ miles from the filtering-beds, and the construction of the works was rendered extremely difficult in various places by the rugged and hilly nature of the country, which necessitated the opening of a temporary road, the erection of several bridges, and the excavation of cuttings; but, in spite of all obstacles, the undertaking was completed within the specified time.

### ELECTRICITY FOR TRAMCARS.

AN account is given by the *Birmingham Post* of an electric motor which is to be tried on the Central Tramway Company's lines in Birmingham. The motor, together with the necessary dynamo machine and accumulators, has been manufactured by the Elwell-Parker Engineering Company, Limited, Wolverhampton, and the trial, or rather series of trials, for they will extend over several days, are likely to be of great importance. It is designed to demonstrate the advantages of electricity over steam, alike as regards efficiency, economy, and public convenience. The Elwell-Parker Company are constructing the motor for the Julien Company, London, who own the Belgian patents which go by this name, but the dynamo and accumulators are the Elwell-Parker Company's own patents. The motor is what is termed a small bogie engine, and in appearance is similar to the steam-tramway engines now employed on the Central Tramways. All the working parts are completely covered in by sheet-iron to a height of 5 feet, all that can be seen being a small portion of the wheels upon which the motor is mounted. A sheet-iron roof extends the whole length of the motor, giving perfect weather protection for the driver. The dimensions of the motor are 9 feet long, 5 feet 8 inches wide between the rails, and 9 feet 6 inches high. It is some four tons lighter than the steam-engines now employed, weighing 8 tons as against

12 tons, and it is of 40 horse-power capacity. The motor travels noiselessly, and the inventors state that it is much more under control than the present steam-engines. The accumulators for providing the motive power will be carried on the engine, and in order to be of equal power with the locomotives now employed by the company, which cover an average of some fifty or sixty miles a day, it is arranged that one charging of the accumulators shall be sufficient to enable a fifty-miles run in the working day at the same speed as at present. The whole machinery will be under the control of the driver, and a double set of driving-machinery is fixed on the motor, one set at either end, so that in making the return journey there is no necessity to turn the engine. The speed is controlled by a switch, which is covered by the Julien patent, and which allows of the power drawn from the accumulators to be so regulated that, without any waste, a uniform rate of speed can be maintained, whether the engine is travelling along an incline or a decline, or on a level road. The brake handle is placed to the right hand of the driver, who by one operation applies four powerful brakes, one to each wheel. It is estimated, as the result of previous experience of the Elwell-Parker Company with electric tram-motors built by themselves, that it will be found that in dry weather the car can be stopped on level ground in half a dozen yards, and in ascending a steep incline in half that distance; but in wet weather a considerable allowance would have to be made for skidding the wheels, the distance occupied in pulling up in that event being probably seventeen or twenty yards. Until the trials come off these distances must, however, be regarded as approximate only.

The accumulators, or battery cells, are arranged along the whole length of the floor of the motor on either side, and are also ranged on two shelves running above the level. They are placed in four rows of twenty-five each. Each cell consists of a small box a foot long and deep, and 7 inches wide, and containing thirty-seven accumulator plates. These plates are constructed alternately of lead of a spongy nature and peroxide of lead, and each is very carefully separated from its neighbour by indiarubber bands to prevent what the electricians term "short circuit"; in other words, to prevent the electric force from discharging itself in each cell and becoming wasted. The cells are filled with a solution of sulphuric acid and water of a specific gravity of 1.170, and each cell when so charged weighs 101 lbs. A fringe of about 2 inches wide of indiarubber projects over the surface of the cells to prevent the acid from spilling when the car stops or starts. The capacity of the

**NORTHERN**  
FIRE LIFE  
ESTAB<sup>d</sup> 1836  
**ASSURANCE COMPANY**  
HEAD OFFICES  
LONDON & ABERDEEN  
ACCUMULATED FUNDS (1888) £3,421,000.

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Awarded FIRST PRIZE by Royal Polytechnic Society, 1884.



A Warm Bath ready in 15 minutes, at a cost of one halfpenny. Easily fitted in any house. Price from £4 4s. complete, including fittings. Compare the cost of this with the ordinary method of fitting-up bath-rooms. No house should be without one.  
Sole Manufacturers:—ARDEN HILL & CO.,  
ETNA FOUNDRY, 14, 16, 18 Constitution Hill, BIRMINGHAM.  
Makers also of the Patent Acme Gas Range, Asbestos Gas Fires, and Acme Bath-Hearths.

**WHITE & SONS**  
WORKERS IN WROUGHT IRON  
ARCHITECTS' DESIGNS  
CAREFULLY CARRIED OUT  
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### OPPERMANN'S "EXCELSIOR" DYNAMOS.

Awarded Prize Medal, 1884.

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Telegrams—"Opmann, London."

PURCHASE HIRE SYSTEM.

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PATTERN BOOKS ON APPLICATION.



whole battery of 102 cells is 280 ampères, and it will be charged without removal from the motor from a dynamo machine fixed at one of the company's dépôts. This dynamo, which the Elwell-Parker Company have also supplied, will develop 18 units, which is equal to 24 electrical horse-power, or about 30 actual horse-power. It runs at 950 revolutions per minute, and gives off a continuous current. The steam-engine force which will be required to drive this dynamo is about 30 or 32 horse-power. To charge the battery, the operation consists in running the motor off the line into the company's shed or dépôt, when two copper wires are stretched from the dynamo to the battery, and, the negative and positive poles of each being connected, charging commences. Six or eight hours will be ordinarily occupied in this charging operation, after a day's work, the exact time depending upon the amount of power which has been expended on the previous day. Supposing the battery has been completely exhausted, the charging would occupy a period of ten hours; but this, it is estimated, would be a very occasional event, since it is never desirable to thoroughly exhaust the power on account of the excessive wear which results. The length of life of the accumulators depend upon how they are treated in this respect.

#### EAST LONDON WATERWORKS COMPANY.

In *The Architect* of last week it was reported that in the case of Johnson v. the East London Waterworks Company, Mr. Lushington had decided the question in favour of Mr. Johnson. A correspondent, writing to the *Times* under the signature of "A Lover of Justice and One who has Studied the Water Companies Acts," says:—At the hearing of the summons against the East London Waterworks Company on the 19th at the Thames Police Court, which resulted in the company being fined, the company's solicitor, Mr. Kebbell, informed the complainant that "he would be sorry he had won the case by the time it got to the House of Lords." Now, as a statement of this kind is likely to deter Mr. Johnson from defending proceedings in a superior Court, permit me to mention that water companies when contesting a point invariably intimate their intention of appealing from Court to Court, the consequence being that in nine cases out of ten the overcharged consumer caves in, after, perhaps, a short and feeble resistance; but public attention having of late been directed to the manner

in which water companies exercise their charging and other powers, the sooner Mr. Johnson's case is carried to the House of Lords the better. Consumers and ratepayers still continue to pay too highly for certain supplies, and it is to be hoped when the new county council is formed that the metropolitan water undertakings will either be bought up or controlled.

#### MEASURING OF TIMBER.

IN the Falkirk Sheriff Court, on Friday, Sheriff Scott-Moncrieff issued an interlocutor in a case of some importance to the timber trade relating to the measurement of a cargo of sawn timbers. The captain and owners of the barque *Rosa Bonheur*, of Liverpool, sued Messrs. P. & J. Wilkie, timber merchants, Grangemouth, for the difference in freight, calculated upon a measurement of a cargo of sawn timber made by the Custom House measurer at the request of the captain, and a measurement made by an ordinary sworn measurer employed by the merchants. The Sheriff in his note to the interlocutor says the difference between the measurements is small, but there is a principle at stake concerning which there has been much anxious contention. The defenders say that, according to the custom of the port of Grangemouth, the merchant is entitled to select his measurer, and to pay freight upon the measurement reported by him. Further, they contend that the expenses of the measurement are to be paid equally by the captain and the merchant, and accordingly they claim a deduction in the present case representing half the measuring fees. It cannot be seriously disputed that for many years back, in the majority of cases, the practice has been as set forth by the defenders. As to this, it seems to me that the weight of the evidence is unquestionably on the side of the defenders. A general practice, however, and a custom binding as a law are not exactly the same thing. In determining whether this practice is to be treated as a custom of such a nature as to be binding upon a foreigner protesting against it, certain considerations must be kept in view. In the first place, it is not unimportant to consider its probable origin. In the usual case the captain of a timber vessel is not a British subject, and is probably but imperfectly acquainted with our language. He may be totally ignorant of the port into which he has come. In these circumstances it is not unnatural that he should, without recognising any custom of port, acquiesce

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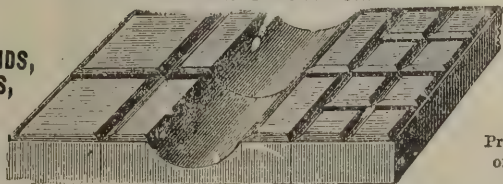
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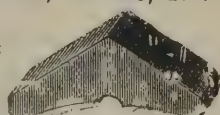
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in the selection of the measurer by the merchant, who is a local man. But even when not satisfied with such a selection, the dread of delay and possibly litigation in a foreign land may easily account for a waiving on his part of any objection. There is evidence to support this suggestion. Captains have protested and afterwards consented to the course followed by the merchant. A few have persevered and succeeded in their opposition to it. There seems to be some ground for holding that measurements at the instance of the captain have become more numerous in recent years. But the most important consideration in a case of this sort is the question of the reasonableness, or unreasonableness, of the alleged custom. That the captain should go for his measurement to a Custom House official is in the highest degree reasonable, and it is not unreasonable that he should decline to admit the nominee of the merchant. The Sheriff, after going into all the circumstances of the case as brought out in the evidence, finds that the defenders have failed to prove any custom of port in virtue of which the pursuers are bound to accept a measurement of the cargo made upon the defenders' instructions, and to pay one-half of the measuring fees; but, in consideration of the conflict between the measurers, he finds that the cargo must be estimated at the defenders' measurement, which is somewhat lower than that of the pursuers, and freight paid accordingly. The Sheriff also allowed the defenders a small sum for wood undelivered by the pursuers, and decreed against the defenders for the balance of freight, but found no expenses due by either party, as success in the action had been divided between them.

#### SEWER AND DRAIN VENTILATION.

PARTICULARS have been sent to us by Mr. Thomas P. Worthington, architect, of Blackpool, of a scheme which he has recently patented for the better ventilation of sewers and drains, and for the disinfection and destruction of the germs contained in the poisonous gases which may be thus drawn to the surface. Mr. Worthington's purpose, broadly speaking, is to make the gas-pillars which are to be found in every street perform this dual work. Obviously, to have free ventilators there must be free inlets and free outlets. Inlets without outlets are worse than useless. At present the surveyors think it sufficient to provide open manhole covers, or vent-grids in connection therewith, at the street or road level. These are

supposed to "ventilate," i.e., to aerate our sewers. In this system, gas-lamp standards, having considerable sectional area with free vent, are provided with large disinfecting and deodorising chambers in the lower parts, and funnel-mouthed extracting ventilators on the lamps at the top into which the heat from the gas jets passes. The temperature therein is more than boiling heat continuously, and it cannot fail to reduce the bacilli and other sewer germs and organisms to impotence from harm. The bottom of the standards must, of course, be in direct communication with the sewers they are intended to ventilate. The following advantages are set forward:—That the system is effective; it is not expensive; it can be adapted to all sewered streets and thoroughfares inexpensively; these standards will thoroughly aerate the sewers, offering the greatest facilities for numerous outlets, which will thereby do away with the congestion and accumulation of poisonous gases in sewers; it answers the purpose of a lamp as well as a ventilator and disinfectant; it has a double protection against the outlet of disease germs; it has no automatically-movable parts, and therefore cannot get out of order; it requires no further attention than the ordinary gas-lamps; the chemical disinfectants may be placed easily by any labouring man; so far as chemical disinfectants can be relied upon, the arrangement of the chamber compels the contact and consequent disinfection of the sewer air before it gets to the lamp, where it is burnt and discharged into the open air; it has the appearance of an ordinary gas-lamp post, and therefore does not indicate its unsavoury but necessary utility; it can be made plain or ornamental. Four of these lamps have recently been supplied to the Blackpool Corporation.

#### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

13282. Henry Harris, for "The filtration and purification of water for domestic usage by an automatic apparatus." (Complete specification.) September 14, 1888.

THE "PERFECTUM."



### "PERFECTUM."

In London the above are kept in stock by Messrs. GEORGE WRIGHT & Co., 155 Queen Victoria Street, E.C., who will be pleased to show and explain them to Architects and Contractors. On view at the Cardiff Exhibition, September and October, and at the Ironmongers and Metal Trades Exhibition, London, November 13 to 24, 1888.

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13377. Charles Tatam, for "Tatam's patent safety fire-escape ladder." September 17, 1888.

13393. Richard Hocking, for "Improved self-flushing apparatus for cleansing privies, sewers, and drains." September 17, 1888.

13398. Francis Weldon, for "An improved method of measuring distances." September 17, 1888.

13401. Charles James Henderson, for "Improvements in the construction, heating, and ventilating greenhouses, vineries, and other buildings." September 17, 1888.

13430. Clarke Merchant, for "Improvements in cowls for ventilation by chimneys." (Complete specification.) September 17, 1888.

13432. John Marshall Siddell, for "Improvements in fittings or devices to be used in connection with outside blinds for shop windows or for analogous purposes." September 17, 1888.

13433. Oliver Richard Butler, for "Improvements in bolts and bars." September 17, 1888.

13444. Norman Kelsey Morris, for "Improvements in the manufacture of white lead and in the means or apparatus employed therein." (Complete specification.) September 18, 1888.

13448. Archibald Caldwell, for "Improvements in apparatus for controlling or regulating the flow of water or liquids in dwelling-houses, factories, and other buildings." September 18, 1888.

13458. James Wilson McKinnon, for "Improvements in ventilators." (Complete specification.) September 18, 1888.

13484. William Phillip Thompson, for "Improvements in or relating to pulley or hoisting blocks." (Alexander M. Kerr, United States.) (Complete specification.) September 18, 1888.

13509. John Shanks, for "Improvements in siphonal cisterns for water-closets and the like." September 19, 1888.

13525. Walter Ralston, for "Improvements in wall-papers." September 19, 1888.

13526. John Twichin, for "Improvements in convertible window sashes." September 19, 1888.

13531. H. R. C. Sharman, for "Improved window-sash fasteners." September 19, 1888.

13539. George T. Wooldridge, for "Improvements in locks." September 19, 1888.

13540. Samuel de la Grange Williams, for "New or improved burners for heating lime-kiln, brick-kiln and other kilns

by the combustion of gas and for other like purposes." September 19, 1888.

13553. Franz Wenzel and Will Cronmeyer, for "A novel construction or arrangement of affixable table for draughtsmen, engineers, and general drawing-board supporting purposes." September 19, 1888.

13556. John Henry Will James, for "Improvements in apparatus for burning and cooling hydraulic lime and cement." (Complete specification.) September 20, 1888.

13561. James B. Gamlin, for "Improvements for chimney-pieces." September 20, 1888.

13562. John Hartford, for "Improvements in sewer-pipes." September 20, 1888.

13591. Herbert Garland and Richard Holdsworth, for "Improvements in fastenings for securing door and other handles, window-blind cord fittings and other like fittings on their spindles or bars." September 20, 1888.

13605. Henry Percival Monckton, for "Combined movable and adjustable lavatory basin and bath." Sept. 20, 1888.

PROVISIONAL SPECIFICATIONS ACCEPTED.

16061. Robert H. Reeves, for "Improvements in the construction and ventilation of soil-pipe, house-drains or other sanitary fittings." November 22, 1887.

8943. John Cridland Mollon and Richard Cridland Mollon, for "A self-acting condensed water exhauster and water-trap." June 19, 1888.

10409. Samuel Williams, for "Improvements in bolts for doors and other purposes." July 18, 1888.

10447. William Parkes and Charles Wakeman, for "An improved sectioning set square for drawing equidistant parallel lines and any direction of variable pitch." July 19, 1888.

10666. George Wooliscroft, for "A new system of decorating pottery, tiles and porcelain, by gold and other metals." July 30, 1888.

11181. Thomas Taylor, for "Improvements in cutting tools known as wheelcutters." August 2, 1888.

11219. William Perry and William H. Reed, for "Improvements relating to roofs or covers for ricks and the like, to scaffolding, and to means for raising and lowering the same." August 2, 1888.

11249. William Ross, jun., for "Improvements in syphon drain pipes and their connection." August 3, 1888.

11306. William George Howard, for "An improvement in window fastenings." August 4, 1888.

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9 Victoria Chambers, Westminster, S.W.  
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and given every satisfaction where I have used it.  
Yours, &c., JAMES WEIR, F.R.I.B.A.,  
To Mr. Grundy, 8 John Street, Bedford Row, W.C.

From ARTHUR W. BLOMFIELD, M.A., Esq., Architect,  
28 Montagu Square, London, W.

Mr. Grundy, of Tyldesley, near Manchester, has carried out  
his plan of warming in several churches built under my  
direction, and in each case it answers remarkably well, and has  
given great satisfaction.

From Professor W. B. ROBERTSON, M.D., West Dulwich, S.E.,  
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DEAR MR. GRUNDY.—I value your apparatus very highly  
indeed. I regard it as the greatest comfort I have in this house.

From Rev. A. FERGUSON SMYLY, Dean of Derry, The Deanery,  
Derry, September 16, 1887.

DEAR SIR.—I cannot refuse to give you a few words of com-  
mendation as to the apparatus you supplied for heating Derry  
Cathedral. Not only is the air of the Cathedral quite pure and  
pleasant to those attending the services, as it must be from the  
fact that most of the air heated is taken from the outside, but I  
find the building itself is so much benefited, as formerly it was  
damp and smelt damp, but now it is very dry and free from any  
musty smell. I find that, although the Cathedral is now much  
larger, the cost of firing is much less.  
To Mr. John Grundy, 30 Duncan Terrace, City Road, London.

From Hon. and Rev. G. G. C. TALBOT, M.A., Withington,  
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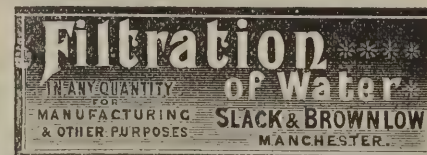
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11460. Charles A. Priestley and Sydney Gurney, for "Improvements in wood-block flooring." August 8, 1888.

11462. Bernard Cassidy, for "Improvements in and connected with corrugated sheet metal roofs." August 8, 1888.

11473. Jacob Davies, for "Improvements in the construction of kilns for burning bricks and other similar articles." August 9, 1888.

11536. William Verity, for "Improvements in means for operating window-sashes." August 10, 1888.

11796. Denis O'Halleran, for "Improvements in bell-pulls." August 16, 1888.

11805. George Salter, of G. Salter & Co., Birmingham, for "Improvements in sash-fasteners." August 16, 1888.

11914. J. W. Helps, for "Improvements in the method of and apparatus for disconnecting gas and water mains, and for effectually closing the ends thereof." August 17, 1888.

12541. John Bennett Cook, for "Improvements in water-closet apparatus." August 31, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

14554. Robert Bristowe Lee, for "Improvements in the manufacture of concrete and cement fireproof building materials and parts of buildings, bridges and other structures, safes, strong-rooms, slabs, blocks, baths, tanks, and other articles, parts, and receptacles." October 26, 1887.

14716. Alfred J. Hopkins, for "Improvements in means of and apparatus for fastening and securing blocks of wood and analogous substances in position when used for flooring and other purposes." October 29, 1887.

15355. A. Patrick, for "Improvements in brickmaking machinery." November 10, 1887.

372. William Gibbs, for "Improvements in glazing." January 10, 1888.

16093. John Sander Stevens and Charles George Major, for "Improvements in and connected with hydraulic lifts." November 23, 1887.

7669. H. P. Miller, for "A new or improved means of and apparatus for attaching sash-lines to window-sashes." May 25, 1888.

11271. C. P. Kinnell and Geo. Rothnie, for "Improvements in apparatus for balancing and opening sashes, casements, or ventilators." August 3, 1888.

#### PATENTS SEALED, SEPTEMBER 21, 1888.

12141. George Kelley, for "Improvements in locks and latches." September 8, 1887.

12765. Mark W. Samuel, for "Manufacture of a plastic compound and treatment thereof for the production of moulded and decorated tiles and other articles." September 20, 1887.

14229. Henry Harris Lake, for "Improvements relating to wood-paving." October 19, 1887.

1175. Jos. Arnold, for "Improved apparatus for deodorising and disinfecting sewer gases." January 25, 1888.

#### ABRIDGMENTS.

"Improvements in the construction and working of fireproof iron and other curtains or screens for theatres and large openings." No. 14556. 1887. John Stones, The Mills, Ulverston. The principal feature of this patent seems to be that corrugated sheets of iron or steel are used, to contain a padding of silicate cotton. These corrugations help to keep the silicate either from falling or shifting.

*Claim I.*—A fireproof curtain or screen, consisting of an open frame or combination of frames, covered on one side with corrugated sheets of steel or iron, and on the other side with plain sheet steel or iron, the intermediate or interior part or parts being padded or lined with silicate cotton substantially as described and shown.

*Claim II.*—A fireproof curtain or screen, of an open frame or combination of frames, covered on both sides with corrugated sheet iron or steel, the intermediate part or parts being padded with silicate cotton substantially as described and shown.

"Improvements in heating stoves." No. 10034. 1888. R. W. Boyd, ironmonger, 105 New Bond Street, London. This improved coke baking or heating stove is so constructed that the gills or plates of which the stove is formed project into the fuel chamber, so as to absorb all the available heat, and in their turn conduct such heat to the outer and corrugated surfaces for delivery to the room or space to be warmed. The draught is regulated by a sliding air-tight ashpit; the flue is controlled by a butterfly or other valve.

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Yours truly, MAXWELL & TUKE.

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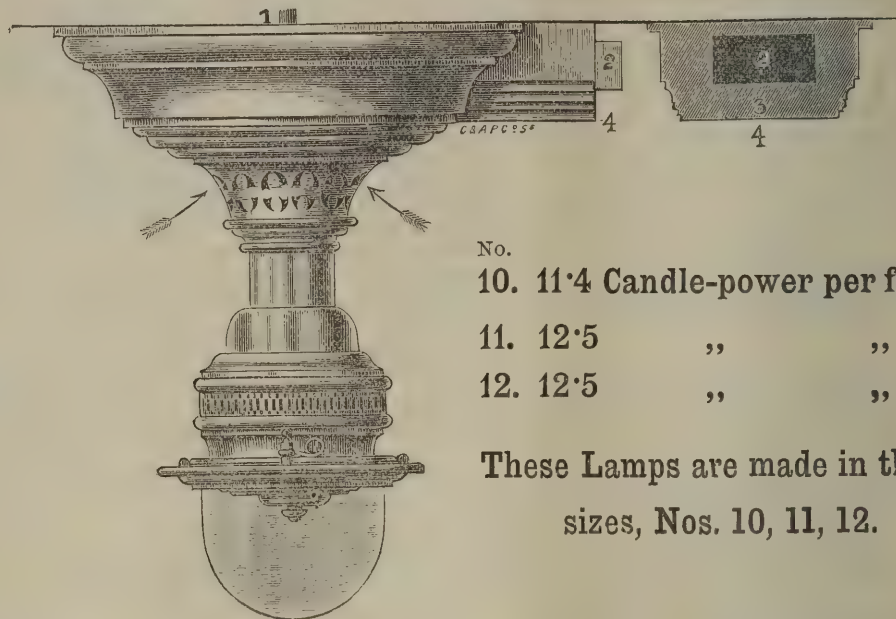
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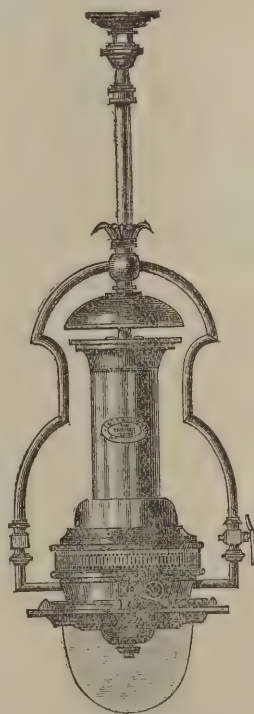
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# The Architect.

## THE WEEK.

BRITISH art cannot be represented at the Exhibition which is proposed to be held next year in Paris unless funds are provided to defray the expenses of a British Art Section, freight, insurance, packing, &c. Sir FREDERICK LEIGHTON, P.R.A., in a letter to the Lord Mayor, who is president of the Executive Council of the British Section, writing "as one on whom his office lays the duty of speaking from time to time in the name of British artists," deploras the decision of the French Government not to bear a share in the expenses of a British Art Section. He had clung to the hope that the liberality shown by Antwerp, Berlin, Munich, &c., would be displayed also in Paris. He says:—"Unless private liberality can be enlisted to supply the funds, we alone shall remain unrepresented at this great display of the contemporary artistic achievements of Europe; and this, too, at a time when the great qualities of our School, its sincerity, its healthiness, its versatility, have succeeded, precisely through the agency of International Exhibitions, in winning a large degree of sympathetic appreciation in places where, not many years ago, it was almost wholly unknown." The sum required, 3,000*l.*, is not large, and a wealthy country need not require to be subsidised at every European exhibition. Sir FREDERICK has contributed 100*l.* towards the proposed fund, and if twenty-nine among the remainder of our British artists follow suit the difficulty would be ended. As it is, the Executive Council have been able to promise 500*l.*, so that only 2,400*l.* is required from private sources.

THERE is apparently no word in the language the meaning of which is so little understood as the word "architect." It is to paragraphists and special correspondents what the wand is to a conjuror. For instance, take some Government building here or in India designed by some Government official. In natural course it soon betrays its jerry origin, and newspapers chronicle the misdeeds of the architect of the building, a man who has no existence, except in the untutored brain of the writer. Suppose something went wrong with house drains that were designed and laid under the supervision of Dr. RICHARDSON, that worthy gentleman need not fear for himself. A mythical architect would receive the blame. Sometimes the purveyor of news might throw more precision into his narrative and boldly put the blame on the late Sir GILBERT SCOTT. Lord GRIMTHORPE, too, if anything went amiss at St. Albans Cathedral, would escape the diatribes that are showered on architects, and Sir GILBERT SCOTT or Mr. PEARSON would be found to be the culprit. Lord GRIMTHORPE freely uses his lance on all sides. Neither he nor architects are beyond making slips in their work. But when ignorant and also educated men join their forces to attack architects on each flank, the public delusion that architects are at the root of all mischief is likely to be strengthened rather than dissipated, if architects do not expose the fallacies of opponents.

In spite of the grand scale of the hotel charges in Ostend, which in the season surpass those of Dutch villages, it is impossible to obtain a glass of water that is potable, either in the old town or on the Digne. A scarcity of drinking water is enough to raise apprehensions in a place where at least twelve thousand strangers are congregated in a limited area. The authorities have therefore set to work to discover an available source for a water supply. It is evident they have not succeeded in their search, as they now invite speculators to construct waterworks, without giving any intimation of an available source. There are plenty of sand dunes around Ostend which might be turned to account. But no hotel-keeper will care where the water comes from so long as there is a plentiful supply.

THE excitement about the defalcations in the offices of the Belgian Chemin de Fer du Nord having abated, another and more important case has suddenly cropped up. It relates to the Department of Public Buildings. As soon as

M. DE BRUYN, the Minister of Works, took possession of his post, he set about an investigation of the duties of the various officers. From information received, the Minister was anxious to discover if any irregularities existed, and he is said to be successful. According to the journals, correspondence exists showing that one of the officers was in the habit of receiving a commission from contractors who were recommended by him to the administration. It is said that M. DE BRUYN has placed the case in the hands of the Minister of Justice. In Belgium there are just now many allegations of the kind in currency, but it does not follow that they are all well founded, for the public service of the country is at root honest.

THE University of Liège is among the most successful of the technical schools of our time. More than fifty professors are employed. The buildings are of various dates, and are inadequate to the teaching of fourteen hundred students. The nucleus of the building was an old Jesuit college, which was increased in size by various additions between 1817 and our time. For a long time the erection of buildings worthy of so important an University has been considered by the authorities and the Government. Plans, it is believed, have been prepared and are now under consideration of the Department of Public Works. The chief difficulty to be apprehended is how to carry out the works without disturbing the classes. The collections are, moreover, of great value. It is not likely that a new site will be proposed, and a piecemeal construction is therefore inevitable. It will have one advantage to the taxpayers, as the expenses will be distributed over a long period.

THE second volume of the *Revue Illustrée* could hardly make a better start than with the first part of the narrative of M. EMILÉ MICHEL'S travels in search of information respecting REMBRANDT in the north of Europe, which when completed will form a text-book for the tourist in Russia and Sweden. As is usual in this magazine, there are several papers on art, which are abundantly illustrated. The tragedy of GERARD DE NERVAL is once more told, and the writer's recollections come as a supplement to those of M. MAXIME DU CAMP. According to the latter, DE NERVAL hung himself with the aid of a belt which he imagined was the zone of one of the court beauties. It is remarkable that the brothers DE GONCOURT (who were allied with THÉOPHILE GAUTIER, one of the best friends of the unhappy writer) do not say a word in their journal about the romanticism of his end, although for years literary men and their hangers-on used to make a pilgrimage to the alley where one of the finest spirits of his time renounced a world that shut its doors against him in winter. The *Revue* is the most interesting of all the monthly publications of the Continent, and, unlike most others, it may safely be admitted into English households.

THE Commission of Inquiry appointed to investigate the fall of the tower of the Church of the Covenant, Washington, have issued their report, from which it appears that the disaster would not have occurred if the specifications had been properly carried out. The rubblework, of which there was a considerable amount, was of an inferior nature, as well as the mortar, and the material was badly bonded. The work was neither first-class, nor of the best kind. "In form and dimensions," the Commissioners say, "the design of the tower furnishes a thoroughly substantial and permanent structure, needing but the simplest kinds of good materials and workmanship for its proper erection."

THE death has just occurred, suddenly, though not altogether unexpectedly, of Mr. J. GAMBIER PARRY. Mr. PARRY was well known in art circles, and has also done good service by valuable contributions to the literature of art. The last of the works on art published by him was "The Ministry of Art." The painting in Ely and Gloucester Cathedrals he has left as memorials of his practical work, as well as the frescoes in Highnam Church, which edifice he built and endowed. He received his education at Eton and Trinity College, Cambridge, and in after life filled the offices of Justice of the Peace, Deputy-Lieutenant for the county of Gloucester, and High Sheriff.



### THE EXHIBITION OF MONUMENTAL ART IN BRUSSELS.

IT is to be regretted that the mayors and auxiliary authorities of English cities and towns do not visit Brussels at the present time, in order to study that part of the Exhibition which is devoted to monumental art. They would see there many things which ought to give rise to reflection. Some one might during such a visit ask the question, Why in such an Exhibition, where so many countries are represented, is there not a scrap of paper or canvas to suggest that Great Britain has realised the advantages of decorating the walls of public buildings with paintings that are not portraits of men who have held office for a brief period—men whose names cannot be rescued from oblivion by all the artist and the frame-maker can do? There is scarcely a town in France or Belgium without pictures which can give pleasure to the humblest inhabitant, for in them he can see something that relates to himself. In one Paris Mairie the work of loading and unloading of barges at a neighbouring canal has been taken as a subject; in another the traffic in old clothes is idealised; and indeed the French painters, like some modern poets, have done their best to glorify labour. In Belgium much is found that must make people feel the historical importance of their native town. Who can forget the series by M. PAUWELS in the Cloth Hall of Ypres, and the no less memorable painting by M. GUFFENS representing the entry of PHILIP THE BOLD? It is in the town hall of Antwerp a student of painting must seek the best work of LEYS. In Courtrai the connection of the town with the Crusades and the Battle of the Spurs is made plain by the painter's pencil. The aid of sculpture is also invoked towards the same end. One example will suffice to be named, viz., the little square in Brussels known as the Petit Sablon, which is surrounded with excellent figures of workmen of all trades in Mediæval garb, that are supposed to be fitting companions for the statues of the patriots EGMONT and HORN. The poorest people in one of these Belgian towns, as they gaze on pictures and statues, must feel they have some share in the history of their country, and who can tell how much they must gain by a thought of that kind?

In another sense monumental art assumes importance. The commissioners who are responsible for the Exhibition in Brussels explain it when they say that monumental painting derives interest which no other class of painting can have from its connection with architecture. Then there is the elevation of the subjects, and besides, if monumental art can claim perfection, there must be harmony between the architecture and the work of the painter and sculptor. All these facts are recognised everywhere on the Continent, but we are either ignorant of them or indifferent to them in England. Mr. WATTS and Mr. ARMITAGE have shown their readiness to decorate public buildings at little more than the cost of materials, but the authorities evidently considered that mural painting was too dear at that price. Sir FREDERICK LEIGHTON, Mr. MARKS, Mr. COKE, and a few others have made it plain that painting, which has as much right to be called monumental as many of the works in the Brussels Exhibition, is feasible in England, but how many town councils have given them commissions? Yet painting of the kind would be less costly than the portraits of mayors and town clerks, which somehow are obtained, although it is supposed money cannot be expended on art.

In the division of monumental art at Brussels we see another instance of the predominance of Germany in Europe at the present time. The visitor on entering cannot fail to be struck with the colossal equestrian statue of Prince BISMARCK. The statesman appears in the uniform of a cuirassier, and the horse (after the manner of HENRI REGNAULT's *General Prim*) is apparently obliged to stretch out his fore-legs in order to sustain the weight of the rider. A more fitting work could not be found for the place. The figure of BISMARCK is suggestive of force organised into power, and it may be said that all the German works are tributes to power under various forms. In the German section of the gallery there are no idylls like those in the French section. The men who are represented are warriors, although, like LUTHER, their battles were fought as civilians.

The immense cartoons by Herr GESELSCHAP for his mural paintings in the Salle d'Honneur of the Berlin Arsenal are

striking examples of the spirit which inspires the German decorators. The subject may be said to be a Titanic battle, in which the agencies of evil are overcome by disciplined force. Giants, strange beings that seem to have been suggested by the Witches of MACBETH, mighty serpents of a length to enfold a world, are all on one side, but the sight of a few celestial warriors throws them into panic. The moral to be drawn is of course that one way to success in war is by the aid of the Prussian system. One cannot have much sympathy with combats between mythological warriors, but the lesson he teaches is illustrated by the painter's own practice. The figures are of heroic size, but there is not a line which does not reveal noble draughtsmanship. All pictures which preach a moral are said to be bad pictures, but much may be pardoned in a cartoon, and the science of arrangement and drawing of Herr GESELSCHAP must be recognised by every critic.

Professor VON WERNER in his work narrates feats of strength of a more human kind, for his theme is the Franco-German war. In all his pictures we have a suggestion that the Germans, and especially the German chiefs, are more than mortal men. The painter might have read HOMER before he set to work on the canvas. But, if looked at impartially, it must be admitted that in his battle scenes—such as the *Attack of the Spickern Hills*—there is an air of reality, and that they do not affect us like the pictures of DÉTAILLE and DE NEUVILLE.

WILHELM VON KAULBACH is represented by engravings of the paintings on the staircase of the Berlin Museum. In them the plan is adopted of having above a group of spectators, who look down upon the events which are transacted below. In the *Crusaders before Jerusalem* the watchers are CHRIST and a host of angels; in the *Epoch of the Reformation* LUTHER and his co-labourers are watched by the people whose minds were supposed to have been emancipated. The originals are known to all who have visited Berlin, and they will recall the weird expression which is seen in so many of the faces. KAULBACH did not believe that the commonplace could be characteristic of such crowds as he painted. Every figure has an individuality, and even when, as in the figure of the flagellant, the face is not seen, the action is sufficient to indicate character. The painter also departed from the type of figure which is most admired in Germany, preferring to make his warriors lithe and spare rather than over-weighty in muscle. The pictures are unlike all others, and about their impressiveness there can be no doubt.

RETHEL, who died about thirty years ago, was another of the great decorators of Germany. Some photographs are shown of his series illustrative of the life of CHARLEMAGNE in the Hôtel de Ville at Aix-la-Chapelle, but it must be admitted that they are less satisfactory than the plates which were published in *The Architect* several years ago. RETHEL dispensed with mythological elements and abstractions, and did not seek to be more than a painter of history. But in what he attempted he was successful, and in his grandest scenes he was never theatrical.

CORNELIUS, who inspired so many of the Germans, is not to be judged by the small engravings at Brussels from his paintings in the Glyptothèque at Munich and the Campo Santo in Berlin. But he observed one principle which his followers set aside. CORNELIUS's pictures can never be taken as easel pictures affixed to a wall. Usually he introduced a framework which was essentially ornamental, and gave a new and it may be a more fitting character to the picture that was enclosed. It is often very difficult to say why certain works should be accepted as decorative, and there is much to be said in favour of the system of CORNELIUS.

The name of BENDEMANN is honoured, and deservedly, in the history of German art. Dr. EDWARD BENDEMANN has sent several single figures of painting, sculpture, architecture, &c., which are in a severe and learned style, and the pictures from the hall of the Normal School at Düsseldorf are admirably composed. The drawings from the paintings by Herr PAUWELS, of Dresden, in the Ecole des Princes at Meissen, suggest works that are intended to preserve the memory of the good deeds of sundry princes in the minds of students who are the descendants of the old retainers of those ancient Electors. The painter's work in Belgium should have been illustrated in the Exhibition.



Austria fills a large part of the Exhibition, although we know many important works which are not reproduced in the collection sent to Brussels. The paintings by Herr GRIEPENKERL, of Vienna, in the hall of the Academy of Sciences in Athens, are illustrations of historical and mythical legends connected with Greece. They begin with the tragedy of PROMETHEUS. M. LOTZ sends sketches of some of his works in the museum at Buda-Pesth, one being *The Propagation of Christianity among the Hungarians*. Another artist who has been commissioned for many works in Buda-Pesth is Herr MAURICE THAN, and his *King Mathias Corvin surrounded by Artists and Scholars*, and *History of Civilisation in Hungary*, will sustain a comparison with any of the works from Western Germany.

The monumental art of Belgium would command attention if it depended solely on the works of M. GODEFROID GUFFENS, of Brussels, who has carried out more commissions for wall-painting than any other artist now living. It is hardly necessary to describe the character of his style, for illustrations of most of M. GUFFENS' paintings have been published in *The Architect*. But no print in black and white can do justice to a painting which is finely coloured, and students of monumental art will do well to consider M. GUFFENS' works on the walls of civil buildings and churches in Antwerp, Ypres, Courtrai, Louvain and Liège. His style is well adapted to paintings of that kind. M. GUFFENS has no archaeological affectations, he never attempts to paint in the manner of an illuminator of a missal. But he spares no pains to be accurate in details of costume, using that word in the widest sense, and his work is therefore sure to be more appreciated in the course of time. In one of the churches of Antwerp some of his paintings have suffered through a defect in laying on the plaster, but elsewhere we have found his colours to retain their original brilliancy. For the decoration of ancient buildings it would be difficult to find better models than the paintings of M. GUFFENS.

The Belgian Government have recognised the skill of M. JOSEPH GERARD in historical painting, and copies of his designs have been obtained in order to serve as an aid to the writings of historians for colleges and schools. His drawings of *The Early Days of Christianity in Belgium*, and *The Epoch of the Dukes of Bourgogne*, have the true spirit of historical painting in severity of style and fidelity to archaeology. The drawings exhibited by M. GERARD denote the importance which is attached to the past by the Belgian Government. If the English Exchequer were overflowing with money, we could not imagine a part being assigned for the production of large etchings of historical events.

M. HENNEBICQ, of Brussels, is more fortunate than most exhibitors, for he is able to show paintings as well as designs. His work is intended for the town hall of Louvain, a building which is rich in statues of the burghers. It was designed about the middle of the fifteenth century. M. HENNEBICQ shows panels containing figures of the three artists whose names are most closely associated with the building. The first is MATHIEU DE LAYENS, the architect, who is represented drawing his plans; JEAN BEYART, the sculptor, is shown at work in the second painting; and in the third we see MARIE VAN BELLE, a calligraphist and miniaturist, who had charge of the painted decoration of the building. It is better to see representations of artists than of the nobles who held sway, and whose tyranny brought about the ruin of Louvain, but in England a different rule is observed. Another painting by the artist represents ANTOINETTE VAN ROSEMAEL, one of the early reformers, expounding the Scriptures; but still larger is M. HENNEBICQ's *Translation of the Corpse of Burgomaster Vanderlyens to Louvain in 1379*. This painting, from its vigour, dramatic power, and colour, would seem to be the work of an artist of the Antwerp school—a school, we may remark, that is not represented in the Exhibition. In 1378 there was an insurrection in Louvain, and many of the nobles suffered for their misdeeds. Then the town was besieged and taken by Duke WENCESLAUS, who exacted severe penalties. The burgomaster went to Brussels to explain the misery of his fellow citizens, but he was murdered on the way by the patricians. The scene depicted by the artist is the arrival of the body of the patriot. The canvas is crowded with figures who are all

in a state of excitement. The picture gives a vision of Mediæval life which an historian could never realise by the aid of words, and it is always surrounded by a crowd.

M. CARDON is an artist who is in much favour with the authorities of Belgium. He has mastered Gothic detail, and no more suitable decoration for an old building could be found than his work. M. CARDON is a fine colourist, and may be said to be an indispensable aid to the architect in restoration. All the exhibits are sketches of his decoration of the Salle des Mariages in the Brussels town hall. In Belgium M. CAPRONNIER stands at the head of the glass-painters. He sends a cartoon of one of his windows in the cathedral of Brussels, which he designed in 1848.

M. DELL'ACQUA, of Brussels, has been commissioned to paint an allegorical picture for the Hôtel de Ville of Trieste, and a photograph of the council chamber suggests the fitness of the picture for its position. The tapestry of Messrs. BRACQUENIE, of Malines, can compete with the products of Governmental looms. It depends for success not merely on the quality of the fabric, but for the design, which is always supplied by artists. The designs by M. GEETS are good samples of those preferred by the firm. The archaic style of the late Baron LEYS, which has helped to create Mr. ALMA TADEMA's Roman scenes, is suggested by the photographs from the frieze in the dining-room of the artist's house. The subject is a sort of Seven Ages of Man, but the figures belonging to the periods are mixed together. M. STALLAERT exhibits a great many sketches, but they are hardly a tithe of his commissions. An artist who was chosen to decorate the National Gallery of Brussels, the palace of the Comte de FLANDRE, the Banque Nationale, must have had a high reputation. M. STALLAERT's work is characterised by a lightness and brilliancy which can rarely be found outside Paris, and it differs from much of the decorative work which is executed in Belgium.

The French decorators evidently believe that art should, above all things, give pleasure. Sermons and didactic discourses can be had without the help of the painter, and there are tragedies enough in the world which find record without being perpetuated on canvas. In the series from the Mairies of Paris, of which photographs are in the Exhibition—copies of the works have also appeared in this journal by the favour of the Municipal Council—it will be found that the artists all take a favourable view of life. Even in scenes of toilsome labour there is nothing suggestive of pessimism. There is in consequence a vast difference between the monumental art of the French and the Germans. The latter are the conquerors—some will say they are the foremost people in the world. But their pictures do not suggest a day when the warrior can rest under his fig tree. Everything serves to remind the German of unending struggles. The hydras we see in Herr GESELSCHAP's cartoons seem to have the knack of coming to life again and must be met with fresh weapons. The French pictures, on the contrary, are mainly of peaceful subjects, and if war is suggested it is in the form of self-sacrifice.

Nearly all the great decorators are present, and by a curious coincidence the works they have sent are generally those which they had given for publication in *The Architect*. Thus M. PUVIS DE CHAVANNES has the pictures from the Panthéon, the *Pro Patria Ludus*, or *Young Picards Exercising with the Lance*, in the Musée d'Amiens, and the *Doux Pays*, which was a present to M. BONNAT, the portraitist. But as the colouring is as characteristic of the artist as his drawing, the cartoons are insufficient to convey a clear notion of his style. An etching of M. JEAN PAUL LAURENS, by M. FLAMENG, does not suggest the character of the original or its sombre power. It will, however, serve as a diagram to explain the positions in the painting of the wonderful studies for the figures which the painter has lent to the Exhibition. The world of fashion is rather afraid of M. LAURENS, but, in spite of neglect, he sets an example of hard work which is almost without parallel in these days of rapid production. In the Exhibition there are no less than fifty-seven studies in oils for the picture in the Panthéon. They are not blottesque daubs, but as finished as if they were intended to be handed over to assistants for reproduction, although, it is needless to say, M. LAURENS does not adopt that mode of execution. These studies should be secured by the Ministry of Fine Arts, for the sake of the lesson they can impart.



M. MAZEROLLES'S work has the qualities which are accepted as essentially Gaulish. He possesses fancy, and a hand light enough to realise his most dainty conceptions. What can be more charming than his *Fairies' Goddaughter*, which was designed for the Gobelins factory? Our readers will remember, from the illustration we published, how in it the fairy world is seen to guard an infant and drive away the wicked spirit, while genii carry their gifts for use. But it is generally believed that originally the child who was under the protection of fairy-land was the late Prince Imperial of France, whose fate did not get him immunity from misfortune. In the ceiling painting of the Comédie Française the design is contributed by M. MAZEROLLES. It is masterly in arrangement, for while the characters of RACINE and CORNEILLE are above this nether world, the men and women of MOLIÈRE are on solid ground. The commission came from M. PERRIN, who was at one time a fellow pupil with the painter. Another work for the theatre is the sketch for the drop scene in the theatre of the Arts Club of Paris, which recalls Arcadian days.

In a very different style to the foregoing is M. FLAMENG'S *Abelard and His School on the Hill of St. Genévieve*. The influence of M. PUVIS DE CHAVANNES is seen in the flatness and sober colour of the work, but unfortunately the painter has not been able to realise the life of the Quartier Latin in ABELARD'S time. The unlucky dialectician was compelled to lecture in improvised academies which his followers erected, but Paris could at least afford him a shelter of some kind. With all his heresy, it was not necessary to teach in the open air. Master and scholars have necks as long as the mysterious ladies in ROSSETTI'S pictures, but not a trace of intellectualism is to be seen in any face. Evidently M. FLAMENG went to the Halles and made philosophers of the porters. The picture is striking, unforgettable, but the professors of the Sorbonne are likely to find more pleasure in the picture of a gleaner by another artist.

The pictures in the Mairies of Paris, which are shown by the aid of photographs, do credit to the Municipal Council as well as to the authors. What city can show so many high-class works ordered at the same time? Paris deserves to hold the first place in art when it has patrons in office like the present Council. It would be difficult to discriminate between the works. Given a Salle des Mariages to decorate, the painters have interpreted the problem each in his own way. M. GERVEX is realistic, M. EMILE LEVY is idyllic, the late M. BOULANGER makes it suggestive of ancient Rome. It is the same with other scenes. M. BAUDOIN makes labour in the fields appear a pastime, just as M. BLANCHON confers dignity on the coal porters of La Villette. M. MOREAU DE TOURS gives the air of an antique priestess to a woman who approves of her husband becoming a warrior. The pictures show how art can ennoble the humblest scenes. It would be interesting to learn what one of the German decorators must think of the French decorations. Habit and prejudice count for much, but he would have to own that in monumental art the French painters are still pre-eminent.

### LINE-ENGRAVING ON METAL.\*

BY SIDNEY COLVIN.

IN line-engraving the method is the reverse of that used in wood-engraving, inasmuch as the lines intended to print black are not left standing in relief, but are sunk or ploughed into the surface of the substance employed. The design to be reproduced is first transferred by tracing to the surface of a metal plate: the engraver then proceeds to incise with a sharp instrument on the plate the outlines and details of his design, and to add shading by means of systems of lines similarly incised, and varying in depth, direction, and distance from one another. In the case of lines thus incised, the method of obtaining effects of shade by cross-hatching offers no difficulty, and is adopted as a matter of course. The metal usually employed in line-engraving is copper; but in the early stages of the art other metals were occasionally used, as silver (and in a few instances gold), iron, and brass, and about 1820-1830 the use of copper was gradually superseded by steel, which from its hardness is capable of yielding a greater number of impressions. When copper is now used, it is customary to face the plate

with a thin coating of steel before printing. The instrument chiefly used in line-engraving is the graver, or burin, a tool having a sharp triangular point, and driven by the engraver point foremost, so as to plough out a clean furrow in the metal as it goes. Pure or unmixed graver-work is comparatively rare; some of the earliest masters of the art having apparently worked rather in the manner of dry-point, *i.e.* with an instrument held like the pen or pencil in drawing; while the method of etching the main lines of the composition, *i.e.* biting them in with acid, has been almost universally employed by the later. When the work of incising the design upon the metal is complete the plate is inked, and then carefully cleaned so that the ink remains only in the incised lines; impressions on paper are then taken by means of a press of special power, by which the paper is forced into the incised lines, and takes off the ink with which they are charged.

According to the generally accepted, but questionable, account, impressions from metal-plates on paper were first taken by the Florentine goldsmiths about 1450 for the purpose of testing the look of their designs in niello-work\* during progress. All that is certain is that about or rather before that date the art began to be practised for this purpose among others. Alike in Germany and Italy (it is uncertain which country had the precedence) it came increasingly into use during the third quarter, and still more during the last quarter, of the fifteenth century, for the production of images of saints, Bible figures, and other devotional subjects, emblematical, mythological, and satirical pieces, scenes of daily life, patterns of ornament, and occasionally also portraits. From its nature the craft partakes of, and as it were stands midway between, those of the painter and the goldsmith, which were themselves often in those days united in the same hands. Several of the greatest artists of the fifteenth century took it up. As a general rule, the early engravers worked from their own designs, and were not merely mechanical interpreters of the designs of others. It is difficult to divide the history of line-engraving into fixed periods, as it neither passed through any such time of abeyance, nor underwent any such radical change of method as wood-engraving. But after the fame won by Marcantonio with his engravings from the designs of Raphael (about 1510-1520), it gradually ceased to be an art of original expression, and became, first in Italy and afterwards in other countries, exclusively an art for interpreting the works of others. As such its practice passed out of the hands of the great original masters into those of specially-trained craftsmen, and its progress thenceforth simply reflects the general movement of art history and of taste.

In our exhibition impressions from niello plates and other experimental varieties of the art in its earliest stages are not given. The series begins with the comparatively mature work of the German and Italian masters about 1480. First, two of the beautiful devotional subjects of Martin Schongauer, the great master of Colmar, in Alsace, whose influence extended towards the close of the fifteenth century over all the schools both of Upper Germany and of the Rhine; and next a copy of the same master's most famous engraving, *The Death of the Virgin*, by Albrecht Glockendon, of Nürnberg. A somewhat younger engraver of the same period, who worked at Munich in a distinctive fanciful manner of his own, was the so-called Martin Zsinger, signing with the initials M. Z.; he is represented by one allegorical, one pastoral, and one legendary subject. We then pass to Italy, where the engraver's art was practised with less technical skill, and with a much simpler method of shading, than in the North, but in many cases with admirable grace of feeling and force of artistic expression. The Florentine school is represented by one of the illustrations to the famous Dante published in 1481, the designs for which were derived, with much modification, from the compositions of Sandro Botticelli, while their execution is traditionally associated with the name (which modern research threatens to render mythical) of Baccio Baldini. The bold and masterly manner of Andrea Mantegna, the greatest engraver, as he was all but the greatest painter, of North Italy, is illustrated by a single example; Jacopo de' Barbari, who belongs half to Venice and half to Germany, and adds to his Italian grace of design a Northern technical elaboration and richness of shading, by three. Albrecht Dürer, several of whose early plates were executed in express rivalry with Barbari, follows next with a group of devotional pieces, and the two famous allegories, the *Knight and Death* and *Melencolia*, which may be regarded in some ways as the central works of his life. Not only intellectually but technically (according to the severe methods of the art in its early age) Albrecht Dürer is the greatest artist who ever practised engraving. Only second to him among the Northern schools, at least in sincerity of aim and manual skill, comes Lucas van Leyden. The attempt of this Dutch master

\* From the new "Guide to the Exhibition Galleries of the British Museum."

\* A "niello" is a plate of silver on which a design of figures or arabesques is engraved, and which is then finished by filling in the engraved lines with a black mixture (Latin "nigellum," whence niello) the better to show off the design.



to express aerial gradation in landscape by means of lines of gradually increasing delicacy was new in his day. From Holland we return to Italy, where several engravers in the early years of the sixteenth century had been in the habit of copying, with their own simpler and more primitive mode of handling, the compositions of the Northern masters. The first Italian master to acquire the true Northern strength, precision, and suppleness of stroke with the graver was Marcantonio Raimondi. Working in youth from the designs of Francia, and presently farther training his powers of hand by copying the work of Dürer, Marcantonio from about the year 1510 applied the skill he had thus acquired almost exclusively to reproducing the designs of Raphael. His practice was to work up the sketches of that master into finished designs, adding to them landscape or architectural backgrounds, sometimes taken direct from Northern examples, but without the characteristic Northern crowding of detail. Two examples represent the classic, and one the devotional, class of Marcantonio's engravings after Raphael.

From about 1520 till near the end of the century the art of engraving was almost wholly dominated by the traditions of Marcantonio and Dürer. The example of the former prevailed absolutely in Italy; a mixed method, combining an attempt at Italian grace of design with Dürer's technical precision and fulness of detail, in the North. A succession of masters, working in great part from designs furnished by the scholars of Raphael, carried on the traditions of Marcantonio at Rome, Venice, and Bologna, in a cold and mannered, but often truly learned and accomplished, style. The engravers who in Germany chiefly worked under the combined influence of Dürer and Marcantonio are the group known, from the minute scale on which they commonly worked, as the little masters, comprising Albrecht Altdorfer, of Ratisbon; Barthel Beham, Hans Sebald Beham, and George Pencz, of Nürnberg; Jacob Binck, of Cologne; Heinrich Aldegrever, of Soest, in Westphalia; and several others known only by the monograms they appended to their works. Of these, H. S. Beham, Binck, and Aldegrever are represented by a number of characteristic examples in the several fields of classic and devotional design, daily life, portrait, ornamental design, and heraldry. Passing to France, where the art of engraving took root later than in Germany and Italy, we find the spirit of the early French Renaissance well exemplified in the series of small designs by Etienne de Laune, imitating the manner of the little masters with a new French lightness and sprightliness of touch; and also in the religious compositions of Jean de Gourmont, whose minute groups of figures, borrowed more or less closely from the Italian, are set in fine architectural surroundings of the artist's invention. All the above masters, German and French, engraved for the most part their own designs, and in their hands engraving is still an original art, partaking of the character at once of painting and of goldsmith's work. But going back to Italy, we find the art of line-engraving practised by Agostino Carracci and his master Domenico Tibaldi, at Bologna, exclusively for the reproduction of pictures and with much loss of the precision (although none of the pretension) which had characterised the immediate followers of Marcantonio.

Meantime, in the schools of Flanders and Holland, severe and minute accuracy and brilliant decision of line, in the spirit of Dürer and Lucas van Leyden, were still aimed at by the Amsterdam engraver family of Wierix, working chiefly on subjects of their own invention, and to a lesser degree by Adriaen Collaert, in interpreting the painting of the Italian schools, and by Hendrik Goltzius. Our example of the last-named master belongs to his early time, when he used to invent and engrave great compositions under the influence, and in what was intended to be the manner, of Lucas van Leyden. Later he carried to an extravagant pitch the florid imitation of Italian work to which all the artists of the Netherlands gave themselves over in the third and last quarters of the sixteenth century. For the present we do not follow this development of Flemish art, but cross, with a family of Low Country artists who adhered to severer methods, to England. These were the Van de Passe family, who settled here towards the close of the reign of Elizabeth, and whose work, especially in portrait-engraving, seems to have given a direct impulse to other engravers in England, such as Elstracke (himself of Dutch birth), and Rogers, specimens of whose careful but somewhat primitive craftsmanship are now rare and highly valued. From these we return to examples of German portrait-engraving as practised in a vigorous but still severe manner lineally derived from that of Dürer, by seventeenth-century masters like Lucas Kilian, Peter Isselburg, and Joachim von Sandrart. Closely allied to these, though trained first at home and afterwards in France, is the great English portrait-engraver of the Commonwealth and the Stuart period, the first really accomplished master of his art in our country, William Faithorne, whose portrait of Charles II. is expressly placed for comparison beside that by Sandrart.

At this point in the progress of the art a somewhat sudden

change in its character is noticeable, a change due to the influence of a single great master, Rubens. For the reproduction of his paintings and those of his school, Rubens gathered about himself and trained a group of engravers, who under his inspiration discovered new resources in the art, and in imitating his exuberance of line and brilliant play of colour-surface, learnt to handle the burin with a new freedom, energy and variety. The chief among these engravers were Scheltius à Bolswert, Paulus Pontius, Peter de Jode father and son, and Lucas Vorsterman father and son. It was their method to use etching freely for the outlines and preliminary work of their plates, the brilliant skill of Vandyke as an etcher helping greatly to stimulate them in the practice. Scheltius à Bolswert is represented with a Holy Family after Rubens and a scene of *bourgeois* jollity after Jordaens; Paulus Pontius with two of his best portraits after Vandyke and Rubens; Peter de Jode the younger with a New Testament piece after Rubens and a portrait of Henrietta Maria after Vandyke; Lucas Vorsterman the younger with the portrait of Gertrude van Veen. In the meantime other masters of the Low Countries, settled chiefly at Rome, were continuing to work according to colder academic traditions in the interpretation of Italian or Italianised-French pictures of the decadence, as for instance Cornelis Bloemart of Utrecht and Michel Natalis of Liège.

In France, until after the first half of the seventeenth century, the great popularity of the art of etching, as practised by two very dissimilar masters, Jacques Callot and Abraham Bosse, caused that of line-engraving to be relatively neglected. During this period, however, Michel Lasne, of Caen, worked in a fashion somewhat stiffly approaching that of the school of Rubens; and Claude Mellan with a great if somewhat mannered and affected skill of his own. This master avoided cross-hatching, and expressed form and shadow exclusively by the flow, direction and varying depth of single lines—a practice in which he was imitated almost to deception by the German Thourneyser. A little later in the same century, under the magnificent and masterful patronage of Louis XIV. and Colbert, Paris, or more strictly the Gobelins, became the home of a school of engravers perhaps the most powerful and accomplished in the whole history of the art, though too much of their industry was unluckily devoted to reproducing the vast and tedious compositions in which the painter Lebrun commemorated the glories of his master. First among this school comes François de Poilly, who brought back from Rome a skill in rendering the works of the later academic schools of Italian painting which exceeded that either of their own countrymen or of the Flemings; his work should be compared with that of a somewhat younger member of the same group, Roullet. This famous school is further represented by Gérard Audran, the most original and inventive in touch and method among all its members, with his *Triumph of Truth* after Nicholas Poussin; by Robert Nanteuil and Antoine Masson, with examples of their incomparably powerful, brilliant and yet sober work in portrait-engraving; and by Gerard Edelinck—a Fleming who brought to Paris the best traditions of the school of Rubens—with his portrait of Dryden after Kneller, and his splendid rendering of the group copied by Rubens from Leonardo's lost *Battle of the Standard*. Later in the same century, the stately traditions of Lebrun and Mignard in French art gave place to a more florid, if scarcely less pompous, fashion under the influence of the painter Rigaud, who found his best interpreters in the members of the engraver-family of Drevet: see his own portrait engraved by Pierre Drevet, and his celebrated full-length of Bossuet, now in the Louvre, by Pierre-Imbert Drevet the younger.

During the greater part of the eighteenth century the French school of line-engravers continued to be beyond dispute the leading school in Europe, while at the same time its aims became more varied and its ideals lighter. Along with sacred and heroic subjects and portraits, which had hitherto almost exclusively occupied it, came in familiar scenes after the Dutch painters, landscape subjects after Claude and his imitators, court pastorals after Watteau and his school, *bourgeois* interiors after Chardin, mythologies after Boucher, and dramatic and sentimental compositions after Greuze. Philippe Lebas included in his multifarious work examples of nearly all these varieties of art, but was especially devoted to the interpretation of Dutch *genre* pictures; Wille, a German whose working life was almost entirely spent in Paris, to *genre* and portrait. Daullé, while in portrait he carried on the traditions of the Drevets, was also an engraver of landscape; while the landscapes of Joseph Vernet employed a great part of the industry of Balechou, who, however, is here represented only by his somewhat pretentiously brilliant and adroitly handled plate of Ste.-Genéviève, after Van Loo. François Vivarès was a landscape-engraver almost exclusively, who, not succeeding at first in his own country, came young to London, where he found a ready market for his plates after Claude Lorrain, Gaspar Poussin, Joseph Vernet, and Patel. Next to these masters in our exhibition comes C.-N. Cochin the younger, with two of his admirable renderings of the pleasant and quiet



*bourgeois* art of Chardin. The *St. Cecilia* of Bernard Baron, after Carlo Dolci, is one of the best works of an engraver of French origin, who during the latter part of his career found employment and a home in England. Next follows an example of work purely and energetically English, in Hogarth's rendering of one of the subjects in his own series of the *Rake's Progress*.

Returning, after a long interval, to Italy, we find the academical traditions of Bologna and Rome still carried on, about the middle and through the latter half of the eighteenth century, by Cuneo and Volpato. These engravers had the merit of addressing themselves in great part to the reproduction of the pictures of the two great masters, Raphael and Michel Angelo; but their work, facile and industrious as it was, fell short alike in true technical skill and in delicacy of appreciation for the originals. In the meantime our own country began for the first time to take a leading place in European esteem for skill in the art of engraving. Robert Strange, a native of the Orkney Islands, trained first in Edinburgh and then in Paris, under Lebas, devoted himself to the reproduction of the classical masterpieces of Italian and Flemish painting; equalling the best engravers of his time in fidelity to the spirit and expression of his originals, while he surpassed them all in delicacy of finish and refinement of flesh-modelling. He is seen to most advantage in his plates after Correggio, Titian, and Vandyke. He had to fight his way against unscrupulous rivalry and opposition, but in the end won recognition and honours. At the same time, the Kentishman, William Woollett, followed up the example set by Vivarès, and, using all the resources of the etching-needle and the graver in combination, carried the art of landscape-engraving to a higher point of power and skill than it had yet reached, achieving a great and just popularity with his reproductions of the works both of Claude and of native masters, particularly of Richard Wilson. He also worked with originality and spirit in the fields both of history and portrait. Next to the work of this strenuous and sturdy Englishman come two heads, engraved with a characteristic flowing and facile prettiness by Bartolozzi, an Italian who came to England about the middle of the eighteenth century, and founded a school of engraving at the time (and now again once more) very fashionable. The nature of his work and influence we shall see more fully later on. The manner of the poet-artist, William Blake, when he was engraving not for his own pleasure from his own designs, but to order from the works of other people, is illustrated in the sober and workmanlike portrait of Lavater, and the wild and wildly-executed head of Satan after Fuseli. Another mystic, William Sharp, next to Strange and Woollett the most accomplished English line-engraver of the time, is represented with the portrait of Dr. Hunter, after Reynolds; Sherwin, a successful follower of Strange, with portraits of Reynolds and of Woollett.

Passing now to the Continent, we find the art practised in Germany skilfully, if somewhat drily, from the third quarter of the century onwards, by Bause, whose subject after Reynolds had not then been engraved by any English artist; and Klauber, who learnt his art under Wille at Paris, and here is represented with a Cupid, after Van Loo. A more powerful pupil of Wille was J. G. von Müller, of Stuttgart, the oldest in years, and one of the strongest, of those academical engravers who represented, towards the close of the last and in the first decades of the present century, the general reaction of the mind of Europe against the levity of the preceding age, and the reviver of a severer and more classic taste. The work of the leading masters of this age is illustrated in our exhibition by proof engravings of great perfection. Their common fault is a certain tendency to academical pretentiousness, and a proneness to set more store (the besetting sin of this art throughout its later history) by technical ingenuity of handling and brilliancy of effect than by fidelity to the finer qualities of the original before them. Italy produced the greatest number of such engravers; and first among them the Neapolitan, Raphael Morghen, a pupil of Volpato, whose fame was great in his own time and since, but whose work is hardly as excellent in its kind as that of his friend and pupil Longhi. Longhi established himself at Milan, where he was the head of a school from which issued several distinguished masters, among them Anderloni. Other contemporary Italians received their training not in Italy but in France; as, for instance, the adventurous traveller Mauro Gandolfi, of Bologna, who worked with Bervic in Paris, and also with Sharp and Bartolozzi in England, before he tried his fortunes at his native town and Florence. Another and justly famous pupil of Bervic was Paolo Toschi, who, having begun with some fine renderings of the most popular pictures of Raphael, by-and-by established himself at Parma, and founded a school of engravers devoted to the reproduction of the great series of decorative paintings by Correggio in that city; a school whose labours were continued after the master's death, and are not yet completed. Among French engravers contemporary with these Italian, and aiming at similar qualities and effects, we have already mentioned Bervic, who is represented by a vigorous rendering of the antique group of Laocoon.

Equally marble-like in effect, and therefore exaggerated in relation to the original, is the engraving after the loveliest of Raphael's monochrome fresco decorations in the Stanze of the Vatican, by Boucher-Desnoyers. Desnoyers was the most famous of all French engravers, from the days of the first to those of the second Empire: the same master is better represented by his *St. Catherine*, after the picture of Raphael now in the National Gallery. His contemporary, Lignon, comes as our last representative of the school, with a fine rendering of Raphael's portrait group in the Pitti.

Going back to England, we find no school similar to those of Germany, Italy, and France existing here in the period between 1790 and 1840. In spite of the distinction obtained in line-engraving by Strange and Woollett, Sharp and Sherwin, popular taste in this country towards the close of the last century ran almost exclusively in favour of the methods either of mezzotint or stipple; and line-engraving was little practised except on a small scale for the illustration of books and periodicals. One dainty example of the time is given in the print and flower-piece by the daughter of an engraver-family, Elizabeth Byrne. A considerable revival of line-engraving ensued, however, after the adoption of the new material of steel, between 1820 and 1830. Landscape and portrait, the forms of art most native to our race, were rendered in steel-engraving, the former especially, with a new and extraordinary minuteness of skill—a skill always too apt to degenerate into the petty and mechanical, but where the workman's hand was kept sensitive either by a special gift of nature or by the superintendence of a man of genius like Turner, yielding results admirable for beauty not less than craftsmanship. This skill is represented by one of the earliest and longest-lived of the masters who practised it, W. B. Cooke, with his small plate of *Pevensey Bay*, after Turner; by William Finden, the accomplished head of a school whose work by-and-by sank into the merely mechanical, with the well-known *Sheep-Washing*, after Wilkie; by J. H. Robinson, the chief portrait-engraver of the day, with the likeness of Sir Walter Scott, after Lawrence; and lastly by J. T. Willmore, with his admirable rendering—truly characteristic of the best work of the school—of Turner's *Oberwesel*.

## TITIAN AND REYNOLDS.

IN the course of a letter to the *Times*, Sir J. C. Robinson states that experiments with regard to oil-colours were made concurrently with those detailed in the report on water-colours. Referring to Titian and Sir Joshua Reynolds, two of the greatest oil-painters the world has seen, he writes:—

Both these great artists were reckless workmen, solicitous only for the attainment of the utmost brilliancy, power, and perfection of colour, tone, and texture in their works, at no matter what cost as to prospective durability. Sufficient for them was their own glorious day, the evil thereof being cast on the shoulders of posterity. They were continually experimenting, eagerly trying every new colour, vehicle, and process, even the most incongruous and obviously perishable; happy if only richer and more glorious hues could be put upon canvas for the day even, if they visibly waned and faded under their eyes on the morrow. Titian's practice in his later time—for these animadversions do not apply to his earlier works—was, in fact, as bad and unreasonable as it well could be. Unfortunately for a long time Sir Joshua copied it; Titian, indeed, was the Gamaliel at whose feet he sat. So infatuated was the great English artist that he seems even sometimes to have regarded as beauties and qualities to be aimed at, obvious evidences of imperfection and physical decay in the idol he worshipped.

Titian's works were, it is true, produced some two hundred years earlier than Sir Joshua's, and a considerable percentage of his very numerous pictures have doubtless perished from unavoidable accidents, but of those that remain the majority even are now but blackened and enfeebled souvenirs of once inimitable perfection. Even of his celebrated masterpieces in great galleries, many would now be but little heeded by mankind were it not for the enduring magic of his great name and prestige.

An entire class of Sir Joshua Reynolds's portraits, on the other hand, exists, which, from their faded and damaged condition, have now but little attraction for the picture collector, and which, while his well-preserved and brilliant pictures are every day commanding more and more extravagant prices, are a drug in the sale-room, and literally almost valueless. These are mostly the pictures of the artist's earlier period, when he was most strangely influenced by Titian; and it should be noted that a period arrived in the painter's practice when he found out the mistakes he had made. He then threw over the luminary and leader of his early years, and sought another guide among the great "old masters," who in that early age of English art were deemed the indispensable and unapproachable models—the only true mirrors and interpreters of nature. In Sir Joshua's more mature period, Rembrandt became, in turn,



the prime object of his worship and imitation, and the Dutchman more or less completely dethroned and superseded the great Italian.

Rembrandt, it must be said, was a far more helpful guide in all matters of technical skill and insight than the earlier master. He, in fact, directly inherited and carried to their utmost perfection the sound and healthy methods of oil-painting which had sprang up in his country, complete and perfect from the very beginning, in the hands of John van Eyck and his immortal contemporaries, more than two centuries earlier.

This perfect *technique* the Italians probably never possessed in equal measure, and it is perhaps not too much to say that oil-painting was never fully acclimatised in Italy. From first to last, in fact, the Italians groped and experimented, often swayed backwards and forwards by the influence of early and different modes and processes which had rooted themselves too firmly to be ever entirely superseded. From Italy, indeed, first proceeded those evil processes and doctrines which ultimately invaded all art practice, even that of the Flemings and Dutchmen themselves.

As regards the bleaching influence of light on oil-pictures, it may be noted that we have no blanched and faded Van Eycks or Rembrandts, yet it is certain that of the pigments employed by them, many were of a fugitive nature; the colours, in fact, were the same as those now in use, permanent and impermanent colours being, as at present, indiscriminately made use of. But the vehicles, the oils and varnishes with which these colours were mixed and tempered, were more carefully selected and prepared, more congruous in mixture, and more intelligently and scientifically applied by these old artists than by their modern successors.

It may, indeed, be taken as fact that when pigments, applied in sufficient body, are well and safely locked up in an oleo-resinous medium, and still more when they are additionally protected, as in pictures, by numerous coats of surface varnish, there can be little or no fading from light; for the atmospheric air, or rather the oxygen contained in it, which we have now discovered to be the all-potent enemy, cannot get access to the particles of colouring matter, completely enveloped and protected as they are by a transparent medium upon which it has no power to operate.

There is, moreover, a curious incidental protecting process, which doubtless sometimes operates in oil-painting, and may in some cases even exercise a considerable preservative influence; it is in the fact that the oils and varnishes employed in the execution of the picture, and the surface varnishes sooner or later superadded, always in the long run darken and acquire more or less of yellow and brown hues. It is this darkening, the effect of carbonisation, which gives the rich golden glow which is often a positive charm in the case of ancient pictures. Now, the golden hue in itself is a barrier to the enemy, for the light transmitted through it is of the particular colour which does not, or at least only in the feeblest manner, give rise to the action of oxygen.

## TESSERÆ.

### Saxon Architecture.

W. BURGESS.

INCIDENTAL pieces of architecture occur in the Anglo-Saxon MSS., in which the British Museum is so rich. It is true that they are generally ill-drawn, but still they show us enough to enable us to draw very valuable conclusions as to what Anglo-Saxon architecture really was, and to refute the generally conceived idea that both architecture and history began in England exactly in the year 1066. Mr. Wright has contributed a most interesting paper on this subject in the "Transactions of the Archaeological Institute," vol. i. In it he shows that the triangular arches and the baluster shafts, which are now recognised as Anglo-Saxon features, occur equally with representations of domes and carved pinnacles (not crocketed), and ironwork, which antiquaries are generally unwilling to acknowledge as belonging to the time before the Conquest; as if the countrymen of Alfred and Edgar, both great and powerful kings, should have been unable to carve a capital or use a chisel, when they were renowned all over the world for their manuscripts, jewellery, and embroidery. I suspect the fact is, that the history of architecture has hitherto been written in far too scientific a manner; and because the art exhibits a general progress and decline, people have believed that sundry processes were unknown at certain periods, when in fact almost all the essentials of building have remained the same throughout all ages. Thus, because Gervase says that the work of the old cathedral of Canterbury was done with an axe and the new with a chisel, we are to suppose that the Saxons had no chisels and no carved ornaments. Now the MSS. distinctly show us elaborate capitals which must have been done with a chisel, and no one can for a moment imagine that so useful and

obvious an instrument could ever have been lost, even in the most barbarous countries, much less so among the civilised Anglo-Saxons.

### Accuracy of Representation in Painting.

R. REDGRAVE.

All incidents occurring in real life are successive in their action, while the painter, by the nature of his art, is confined to a momentary representation of the incident chosen. In the succession of events tending up to the moment when we have conceived the action to be fixed in the reflective glass, some points before, some after the culminating act, have, no doubt, tended to heighten the pathos and to increase the interest. Are such to be overlooked, or may the painter be allowed to gather them in, from their succession in the course of time, to the definite moment he is about to represent for us? The painter's art also of necessity implies a spectator, and requires such a disposal of the details of the action to be represented as will best bring the various points before the eye of such spectator, and, while naturalness and individuality should not be overlooked, may such an arrangement as best tends to bring out all the details be permitted to the painter? The painter can only speak to the eye, and must in a great degree render the qualities of the mind by nobleness of aspect or dignity of action. St. Paul said his personal appearance was mean: is the painter of any incident in the life of the apostle to the Gentiles so to represent him—to be strictly faithful to this description? Is it desirable to picture virtue, modesty, or truth by loveliness of exterior, or should we be equally interested in these virtues if their possessor is shown to us as ugly or ill-formed? Professor Green, in his Academy lectures, used to take very high ground on this point, and to say that the painter or the sculptor might, by their art, give us a much truer personation of Socrates than if we verily saw the great heathen philosopher; and Socrates himself seems to bear indirect testimony to this truth in his reply to one who expressed disappointment at his personal exterior. Again, everything in a picture should be in harmony with the event described. Yet it is hardly to be expected that Nature will sympathise with every event. Terrible deeds happen when the sun is shining and Nature arrayed in smiles; in such a case it would seem that the painter's art was best exhibited in enhancing the terrors of the scene by showing the elements in greater harmony with the event. These remarks refer to scenes in real life or in contemporary history to which I limited my observations in the first instance. What will be the course when the event chosen is from poetry, fiction, or when, from remote antiquity, it has to be realised on canvas to a race of a wholly different civilisation, feelings, institutions, or manners? There may, as we have seen, be reasons for a departure from the literal representation of an action which took place even before the painter's eyes, or known to his immediate contemporaries; and even in these instances the literal reflection of the scene already alluded to might not be the truest, as it would hardly be the most artistic. But in treating the great events of past ages, much more the relations of poetry or fiction, great latitude taken by the painter may be used so as to bring home to us the truths of history, or the inventions of poetry, far better than a more literal rendering.

### Style in Sculpture.

SIR M. D. WYATT.

In what are generally understood as styles in the history of art, such as the Grecian, the Roman, the Gothic, the Renaissance, &c., may be recognised deeply interesting accumulations of experience concerning the nature of men's intuitive affections for certain concatenations of form. Styles are usually complete in themselves; and, though not of uniform excellence, are still generally concordant among all the various members that compose them. Whatever may have been the dominant form in each, or whatever the favourite set of ratios, proportion usually pervades each whole monument, as it may be generally traced in a few detached mouldings. Styles, therefore, may be regarded as store-houses of experiments tried, and results ascertained, concerning various methods of conventionalising, from whence the designer of the present day may learn the general expression to be obtained by modifying his imitations of nature on the basis of recorded experience, instead of his own wayward impulses alone. Canova, Gibson, and many of the greatest masters in art, held and hold the creed that nature, as developed in the human form, can only be rightly appreciated by constant recurrence to, and comparison with, the conventionalities of the ancient sculpture of Greece. Mr. Penrose has shown us what beautiful illustrations of optical corrections in line may be gathered from the study of her architectural remains. Mr. Dyce, who has made himself deeply acquainted with ancient styles, thus expresses himself on the subject:—"In the first place," he remarks, "the beauties of form or of colour, abstracted from nature by the ornamentist, from the very circumstance that they are abstractions, assume in relation to the whole progress of the art the character of principles or facts, that tend, by accumulation, to bring it to perfection. The



accumulated labours of each successive race of ornamentists are so many discoveries made—so many facts to be learned, treasured up, applied to a new use, submitted to the process of artistic generalisation, or added to. A language and a literature of ornamental design are constituted; the former of which must be mastered before the latter can be understood, and the latter known before we are in a condition to add to its treasures. The first step, therefore, in the education of ornamentists must be their initiation into the current and conventional language of their art, and by this means into its existing literature." By this last passage we may fairly assume that Mr. Dyce would recommend first the study of the conventionalities of the student's specialty, and then as much as life is long enough to learn. The previous error in art education has been to grasp at so much vaguely and attain so little practically. The modifications which nature receives at the hands of the intelligent sculptor are so various, and frequently so subtle, that it would require a volume to enumerate them, and an Eastlake to write it. We can at present glance but at a very few. The first condition of the highest class of sculpture is, that it should be allied with the noblest architecture, to which it should serve as an inscription, explaining to those capable of reading its ideal expression those purposes of the structure which it is not in the power of architecture alone to convey. In all such cases fitness prescribes the subject—simplicity, its sublimest treatment—contrast, the general conditions of the lines of its composition. In order to give to his works that commanding language which speaks to the heart (the phonetic quality in Mr. Fergusson's admirable theory of beauty in art), the sculptor requires to select from his observation the expression of individual forms: those precise lines he learns from study and experience invariably convey the particular sensations it is his office to communicate to the mind of the beholder. It is by some such process that an approach was made by the Greek sculptors of old to attain an embodiment of their conceptions of divinity and the *beau idéal* in loveliness of form.

#### Time Occupied in Fresco Painting.

C. H. WILSON.

It is not difficult, in examining some frescoes, to ascertain the time occupied in painting them. In some examples the joinings by means of which this calculation can be made are distinctly visible; in others they are either so well executed, or are so concealed by the use of distemper, that it is very difficult to trace them. It is evident that the old masters painted with great rapidity; large and important works, judging from the following examples, were executed in a month or six weeks. The *Incendio del Borgo*, in the Stanze, seems to have been painted in about forty days; the group of the young man carrying his father has been executed in three days. The exquisite group of the Graces, in the Farnesina, by Raphael, has been painted, at most, in five days. The Cupid and the head of the Grace, with her back to the spectator, have occupied one day; the back and part of the lower limb of the latter figure, another. In this day's work the rest of the leg may have been included. There appears to be a joining across the knee; there was certainly one across the next; both these joinings do not follow outlines, but are in parts of the figure which are in shadow. It is, of course, better to cut by outlines; but this is not always possible, especially in very large figures. The Germans prefer cutting across a broad light when circumstances compel the artist to make a joining where there is no outline. The graceful composition called *Galatea*, also in the Farnesina, has been entirely executed in eleven or twelve days; the head and body of the principal figure have been painted in one day.

#### Windows in Ancient Irish Churches.

G. PETRIE.

In the windows of the ancient churches, which are always of a single light, the same simple forms are found which characterise the doorways; the horizontal head, however, so common in the doorways, is but of comparatively rare occurrence in the windows; while, on the other hand, the pointed head, formed by the meeting of two right lines, which is so rare, if not unknown, in the most ancient doorways, is of very frequent occurrence. The horizontal and triangular-headed windows are usually found in the south wall of the chancel, and very rarely in the east wall, which generally contains a semi-circular-headed window, the arch of which is often cut out of a single stone. In many instances the head is also formed of two stones, as in the east window of the oratory at Gallerus, built without cement. In the triangular-headed windows the pyramidal head is almost universally formed, both externally and internally, of two stones laid in such a manner as to form two sides of an equilateral triangle; these stones, like the lintels of the doorways, most usually extend through the entire thickness of the wall. In none of these windows, of whatsoever form they may be, does there appear to be any provision for the reception of sashes or glass; and it may be observed that no notice of the use of glass in the windows of the ancient churches is to be found in any of the old "Lives of the Saints"

or other Irish historical documents, although it would appear certain from Irish historical tales of an age anterior to the Anglo-Norman invasion that the Irish were not ignorant of the application of glass to such purposes. They seem, however, to have been unacquainted with the art of manufacturing it for windows, and it would appear from traditions preserved in many places that parchment was used as a substitute for glass, and other substances, such as horn, which no doubt would admit sufficient light for the performance of religious ceremonies in which candles were necessary. The windows, necessarily narrow externally, were invariably splayed internally to admit as much light as possible. There is one instance in which the window is splayed both internally and externally. It is found in the stone oratory built without cement, situated near the old church of Kilmalkedar, about a mile to the east of Gallerus, and is unquestionably one of the earliest ecclesiastical structures in Ireland. In these primitive structures the windows, like the doorways, are most generally without any architrave or ornament of any kind, and indeed this absence of decoration is a characteristic feature of the entire building. It is not altogether, however, the result of poverty and ignorance of the arts in their founders. Poor these honoured individuals unquestionably were, but that poverty generally, if not in all instances, appears to have been voluntary; but that they were ignorant of the arts, or insensible to their influence, could scarcely have been possible in men very many of whom—Romans, Gauls, and Britons—were educated where those arts, though they had become debased, were still cultivated; and there are still remaining indisputable evidences of their skill in those arts, in ancient croziers, bells, shrines, &c., and in illuminated manuscripts not inferior in splendour to any extant in Europe.

#### Easements by Prescription.

L. WEBB, Q.C.

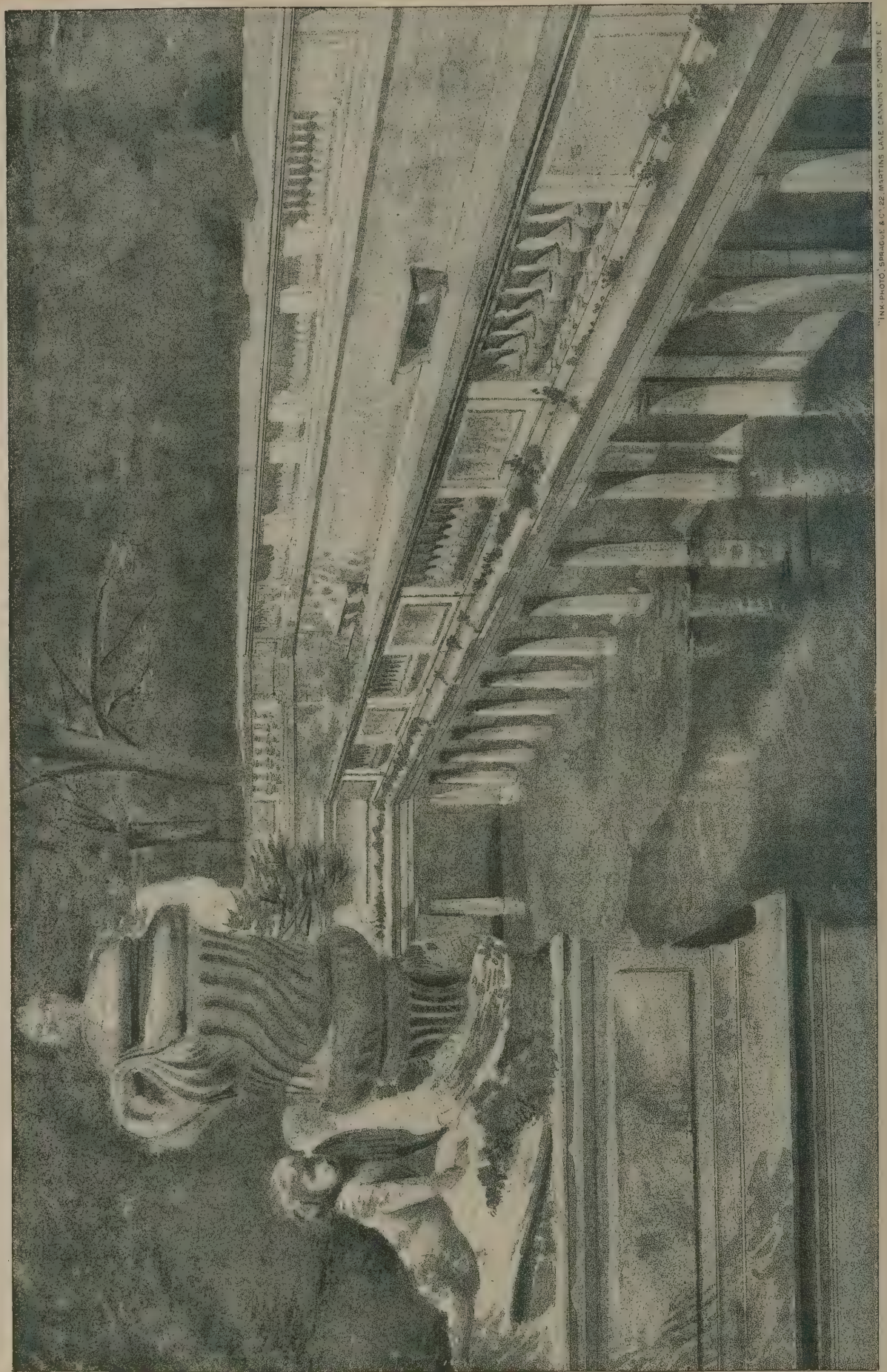
Easements are acquired by prescription, or, in other words, by possession held during the time and in manner fixed by law, for after the lapse of the requisite period the law adds the right of property to that which before was possessory only. To constitute a legal possession there must be not only a corporeal detention, or that quasi-detention which, according to the nature of the right, is equivalent to it, but there must also be the intention to act as owner. An enjoyment in order to confer a title must have been uninterrupted, both as to the manner and during the time required by law; but in these easements which require the repeated acts of man for their enjoyment, as rights of way, it would appear to be sufficient if the user is of such a nature, and takes place at such intervals as to afford an indication to the owner of the servient tenement that a right is claimed against him—an indication that would not be afforded by a mere accidental or occasional exercise of it. By the 2 & 3 Wm. IV. c. 71 (1832), commonly known as the Prescription Act, the title by prescription is governed by statutory provisions, making length of possession prescribed by the statute a bar or title of itself, which was so before only by the intervention of a jury. The Act provides that, (1) claims of right of common and other rights with profit shall not be defeated after thirty years' uninterrupted enjoyment, unless held by consent or agreement; (2) claims of rights of way or other easements the prescription should be twenty years; (3) when the access and use of lights to and for any dwelling-house, workshop, or other building shall have been actually enjoyed therewith for the full period of twenty years without interruption, the right thereto shall be deemed absolute and indefeasible, any local usage or custom to the contrary notwithstanding, unless it shall appear that the same was enjoyed by some consent or agreement expressly made or given for that purpose by deed or writing; and (4) each of the before-mentioned periods should be deemed to be those next before some suit or action wherein a claim to which such periods relate shall be brought into question. A custom formerly prevailed in the City of London that a man might build to any height on his old foundations, although he obstructed his neighbour's ancient lights; and the like custom also existed, I believe, in the city of York and other places; but in the *Salter's Company v. Jay and Truscott v. the Merchant Taylors' Company*, it was decided that such customs were abolished by the Prescription Act. One object of the Act was to shorten the time by which persons who had the access and use of light could acquire an absolute right to it. The third section does not, it will be observed, say "when the access and use of light shall have been enjoyed as of right," because every person has a right to so much light as can come to his window. The Act brought this to a simple question. It says that, after twenty years' enjoyment without interruption, the right shall be deemed absolute and indefeasible. In order that the enjoyment which, in the quasi-possession of an easement, may confer a right to it by length of time, it must have been open, peaceable, and "as of right."

The Keith Institute, with all the contents of the library and museum, was destroyed by fire last Sunday morning.









OLD ROMAN BATH, NÎMES.  
from a drawing by A. NEEDHAM WILSON.

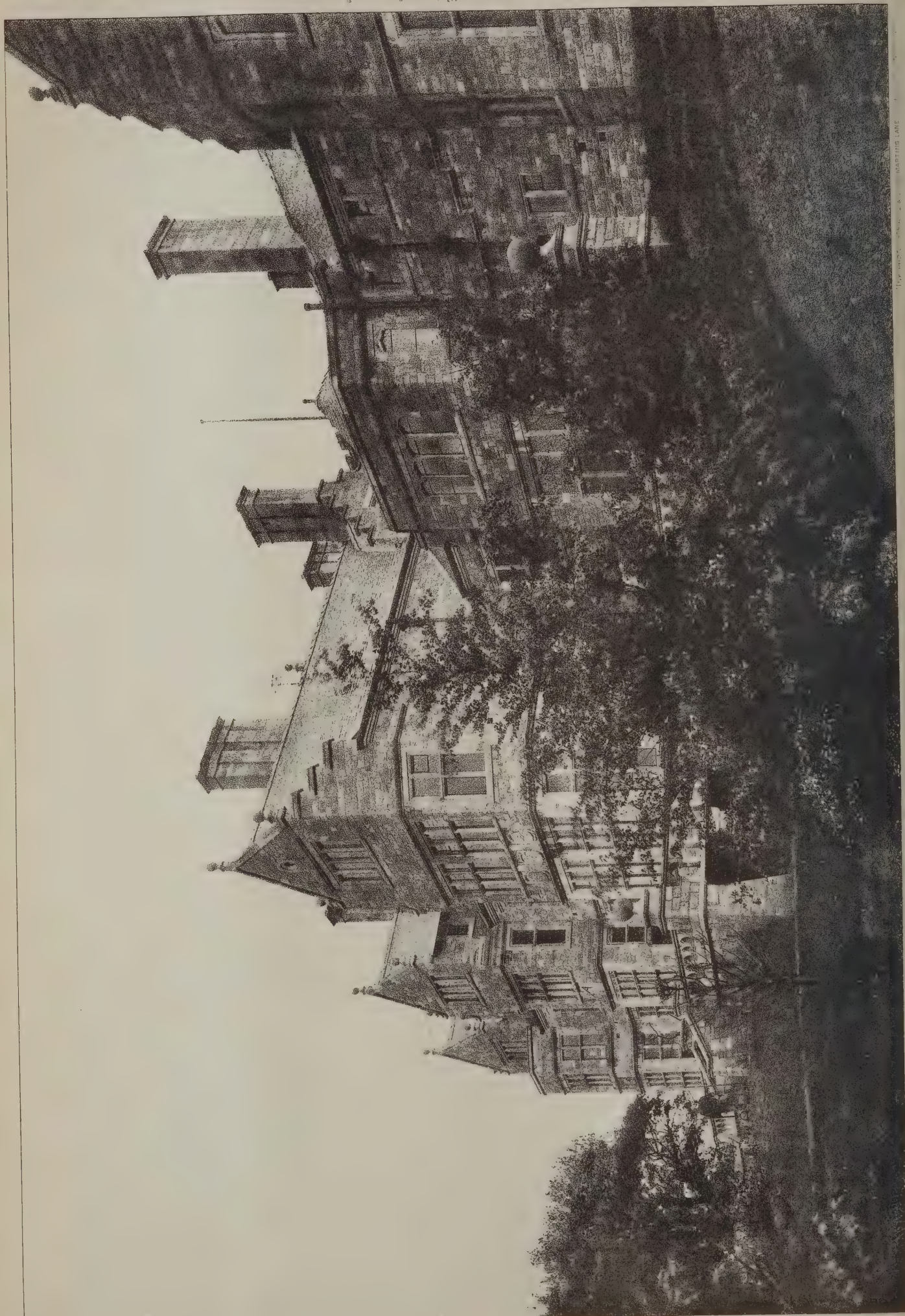
"INK PHOTO," SPRAGUE & CO., 22, MARTIN LANE, LONDON E.C.







The Architect, Oct. 5<sup>th</sup> 1888.



ABBEYSTED IN WYRESDALE. (S.E. VIEW)

THE ARCHITECT, OCT. 5<sup>TH</sup> 1888. MARTIN LANE









Oulton Hall, N<sup>r</sup> Leeds. New Wing, for Edmund Ca





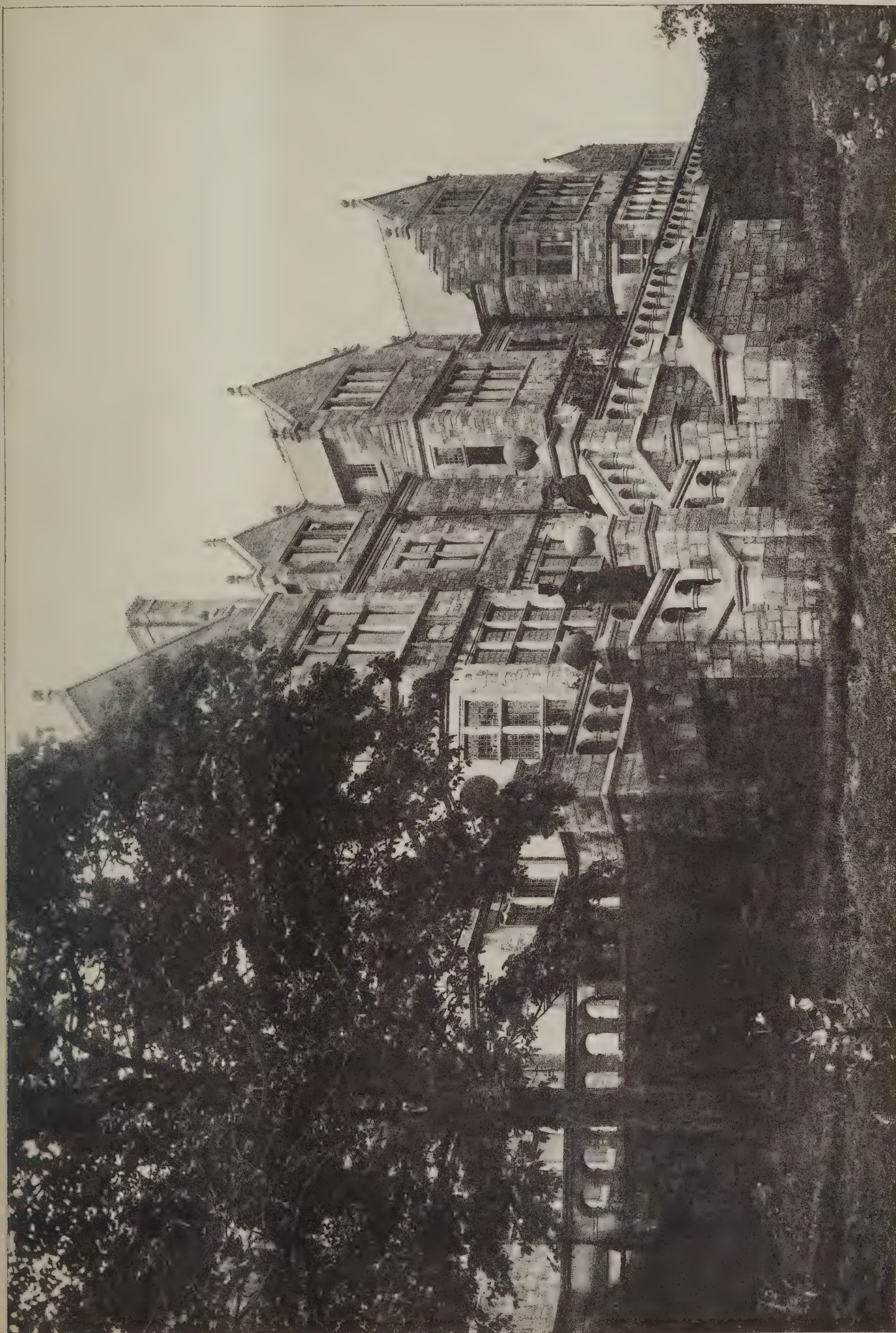
erley Esq<sup>re</sup>

Chorley & Cannon, Arch<sup>ts</sup>  
15, Park Row, Leeds.









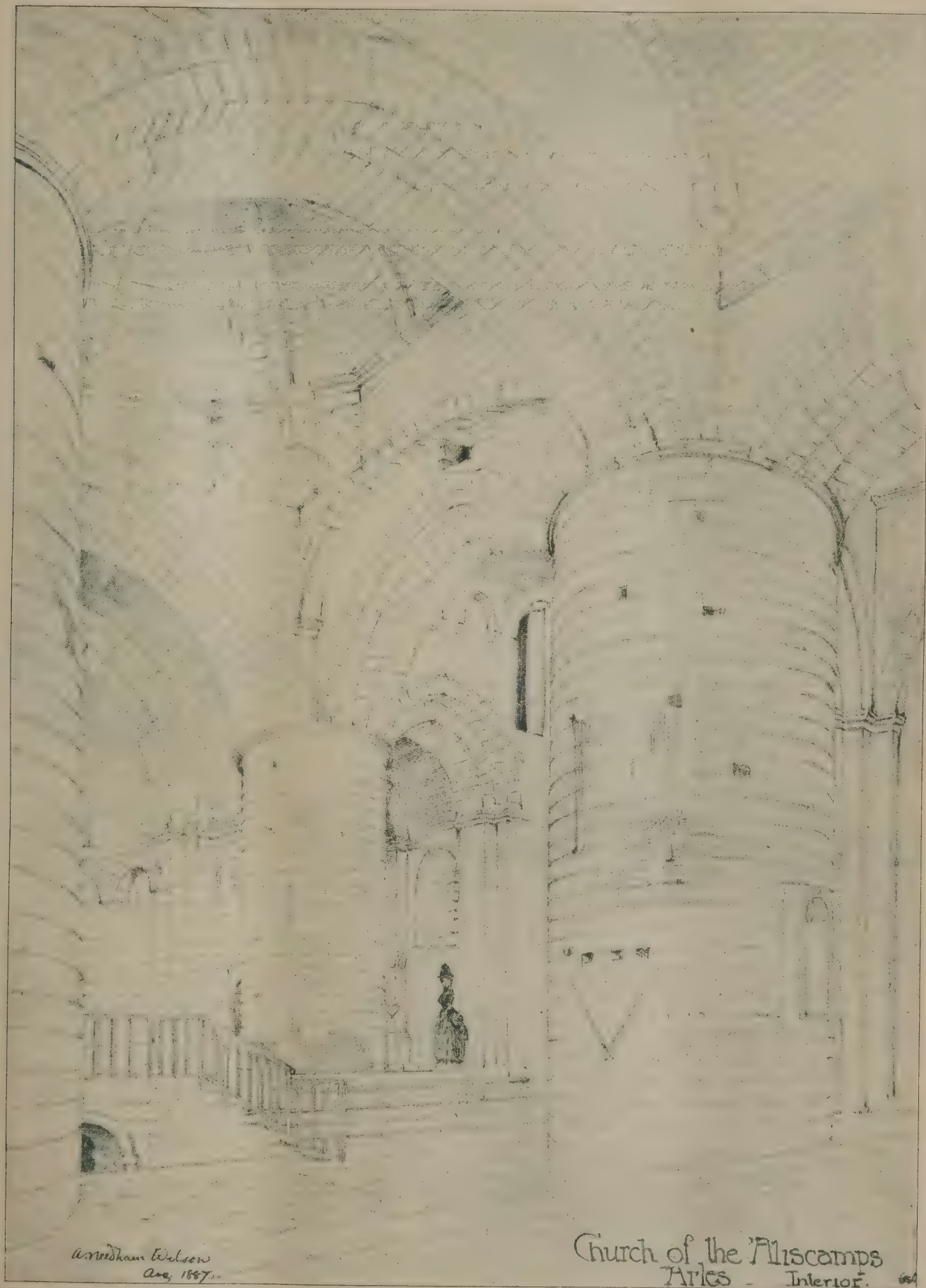
ABBEYSTEAD IN WYRESDALE. (S.W. VIEW)

DOUGLAS & FORDHAM Architects.









CHURCH OF THE ALISCAMPS, ARLES.  
From a Drawing by A. NEEDHAM WILSON







## ILLUSTRATIONS.

ABBEYSTEAD, WYRESDALE, LANCASHIRE.

WE publish to-day two views of the residence recently erected by the Earl of SEFTON, K.G., in a charming position, which commands extensive views of Wyresdale, while the moors adjoining afford abundant opportunity for sport. The buildings are erected with the hard stone obtained on the estate, which furnished the material for both walling and dressings, and the roofs are covered with green slates. The flat roof of tower, which affords a capital point of outlook over the country, is of the Claridge Company's asphalt. A broad terrace runs along the south front of the house, terminated as shown in one of our views by the bridge which spans the little mountain stream running down under the eastern wing of the house to join the Wyre in the valley below. The general contractors were Messrs. J. & W. BEANLAND, of Bradford, the architects being Messrs. DOUGLAS & FORDHAM, of Chester. Our views are reproduced from photos by Messrs. BEDFORD LEMERE & Co.

OULTON HALL, NEAR LEEDS.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

27.—OLD ROMAN BATH, NIMES.—[A. NEEDHAM WILSON.]

28.—CHURCH OF THE ALISCAMPS, ARLES.—[A. NEEDHAM WILSON.]

## MISTAKES IN ARCHITECTURE.\*

BY PROFESSOR T. ROGER SMITH.

"WE are all of us wrong sometimes," so spoke, in the hearing of a friend of mine, one of our best-known humourists and men of letters. They were together on a steamer, and were watching the floundering of a sailing boat being navigated by a mariner who clearly had made a mistake in handling his craft. The famous man had a young daughter with him, and she asked, "What—pray what—is he doing, father?" and got the reply, "He is wrong, my dear; we are all of us wrong sometimes."

No truer word was ever spoken; and, if for no other reason than because it is so universal a fate to get wrong sometimes, mistakes would be justified as a subject for a lecture. But there is a much better reason for my selection of this subject. Forewarned is forearmed; and, though I cannot promise you an immunity from all mistakes, I can, I hope, point out some into which there might perhaps be some danger of your falling, and against which you will be likely to guard if your attention has been called to them.

A mistake is always an evil, and often a most serious evil. There are mistakes which a man may make inadvertently, and without blame, but which yet entail consequences more serious and lasting than those which follow many a crime. Shakespeare paints Wolsey as arrogant, unscrupulous, shrinking from nothing so that he might compass his ends; yet it is not any of the dark deeds with which he is credited that ruins him, but the blunder of laying a paper intended for his own eye alone before that of the king. It is only a mistake when a signalman gives the wrong signal, or a pointsman turns the points the wrong way, but it may lead to the slaughter of a score of innocent persons; or, to come nearer home, it is only a mistake to miscalculate a girder, or misjudge a foundation; yet it may lead to the ruin of a fine building and of its architect's career.

If, then, you succeed hereafter in steering clear of even a few mistakes in consequence of their having been pointed out here, that will be ample justification for our spending an hour together about this somewhat uninviting subject. I propose that we shall take up in the first place students' mistakes, and secondly those of architects; and though I will try to be orderly, I greatly fear that, as mistakes are subject to no rules that I know of, a discourse on them must of necessity be rather an irregular lecture. We shall, of course, have to leave unnoticed far more mistakes than can be considered, so those will be selected which are in the nature of things not unlikely to occur. Many of them will be such as have actually come under my notice; and, in clearing some of them up, I shall ask leave now and again to borrow a hint from the proverbial wisdom of our forefathers.

There is one peculiarity about mistakes, and what they originate from, which makes it not a little difficult usefully to

consider them in a mixed assembly. I allude to the difference in mistakes traceable to the wide differences in temperament, raining, quality of mind, and habits between different men. Put two men to the same test, and they act differently. If that test be some circumstance in architectural study or practice where there are several ways of going wrong, and but one of going right, each of them may make a mistake; yet it is all but certain that they will not both make the same mistake; they may each take a wrong road, but the roads will go in opposite directions. In acting as assessor in architectural competitions I have again and again seen this. One designer, for example, who is timid and perhaps inexperienced, with but cramped ideas, falls into the mistake of producing a formal, cold, spiritless design, correct perhaps and possibly economical, but showing so little invention, and with so little worth remark about it, that it has no chance. His neighbour lets loose a fancy and fertility of design of which he is the fortunate possessor, utterly regardless of considerations of expense or suitability, and produces a splendid plan for a building that could not be put up for three times the money, and that if erected would be quite inappropriate to the site and purpose, and of course his failure is as complete as that of his rival.

Each of these two competitors has made the mistake of failing to understand what was wanted, but the failure has been in opposite directions. No. 1 has fallen short, No. 2 has overshot the mark. I shall have occasion in the course of the lecture to mention other mistakes which, so to speak, hunt in couples from this reason, and we may rest assured that many a man who is safe not to make a mistake in some one definite direction may be in great danger of running to the opposite extreme.

*Students' Mistakes.*

To turn now to students' mistakes. The one which first seems to present itself is neglecting opportunities. This, when wilfully done, is vicious; but it is a mistake often made out of pure thoughtlessness. Many a youth fails to realise that when he left school or college and entered an office he embarked upon a quite new career, and that he has to acquire knowledge in a different way, and to enter upon a totally distinct education. At school or college the schoolmaster or the professor teaches; in an architect's office the principal gives opportunities. The schoolboy, or, to a certain extent, the collegian, gets into difficulties if he omits or neglects to learn. There are no equally immediate uncomfortable results if a pupil neglects his opportunities; but, nevertheless, the loss to him is serious—in some cases irremediable—though in most instances, as I have said, I believe this neglect to arise entirely from failing to comprehend the situation, and not at all from wilfulness or idleness.

Every chance of taking part in what an architect or his assistant have to do in actual practice is an opportunity—even copying a letter, making a tracing, or entering a message in a call-book, is a lesson if the pupil chooses to learn from it; much more valuable are the chances of seeing work and materials. The nature and use of these opportunities have been dwelt upon very thoroughly in some of the published addresses of recent Presidents of the Architectural Association, and, to some extent, by myself on a former occasion of this sort; so that I hardly need pursue the topic further, but may turn to mistake number two.

It is a great mistake to lose heart and give up. I believe there comes to most young men a time when the novelty of their change of occupation and position has worn off and the irksomeness of routine is being felt, with possibly the depression due to being in lonely lodgings, instead of at a bright home or the sixth form of a busy school, and the wish to give up rises. Fortunately, in most cases this is practically impossible, and the student feels obliged to stick to his work, gets over his difficulties, regains heart, and goes on. But time and tone are often lost in the struggle, and it is a thing to fight against. Rest assured that if your profession has been chosen with any degree of care, you are not likely to better yourselves by a change, and that to begin business life by losing a year or two, and starting afresh with the consciousness of a failure behind you, is, to say the least of it, unfortunate. Of course occasionally a student turns up of whom one must in honesty say that the greatest mistake of his life was adopting the architectural profession. If a man is thoroughly unfit for a calling on which he has entered, by temperament, training, and habits, and he and his friends become honestly and deliberately aware that this is so, of course the only wise thing to do is to stop. But for one person who has really made such a mistake, there are probably a score who, for a time, fancy they have done so; therefore it is far safer to urge you to resist giving up than to suggest it as a good thing to do. Remember that "A rolling stone gathers no moss," and "Faint heart never won fair lady."

It is not, however, only the pupil who is apt to lose heart. There is a good deal of discouraging and difficult business to be got through by many young men in the interval between their articles and their start in practice, and again in the early days of practice. In all these difficulties, whatever you do, do

\* Opening lecture at the commencement of the Session 1888-89 at University College, London.



not allow yourselves to be cast down. Constancy to a career is a matter to some extent, nay to a very great extent, under a man's own control, and the man who succeeds is the one who resolves stoutly that, be the rebuffs or disappointments or perplexities never so trying, he will not allow them to master him, and who carries out that resolve.

The young man, perhaps fresh up from the country, who goes round to the offices of one architect after another, and who answers every advertisement in the papers in the hope of getting employment, is on a very trying quest. But he is doing what most of us have had to do before him, and he is engaged in a way which has procured for many a man the opportunity of earning his daily bread, and for some has proved the first step in a career that has led to brilliant success. One of the most distinguished professional men of the day began his London career, when an unknown foreigner in our city, by answering the advertisement of a leading architect who wanted a young man to do nothing but trace in his office. This humble post he took, and filled sturdily till it was found how well he could do very much better work; and now his name is on every one's tongue. The proverb to take up when seeking for employment is, "Leave no stone unturned." This proverb is said to have been suggested by the habits of a sort of baboon who eats scorpions. Now, these creatures lurk under flat stones. So to make sure of his meal the animal, not having any clue to which stone may cover the hiding-place of the delicacy he desires, systematically turns over every stone as he goes. If this be not true it is apposite—*se non è vero, è ben trovato*—and gives a hint how to proceed when one is looking for employment in London.

To the more advanced man, who is feeling—as who among us does not sometimes feel?—that it is very hard to get on, I may perhaps offer the suggestion once made to me by a very successful man when I was complaining that I found it difficult to get on. "Do not forget that the difficulties are your security"—a consideration which has so much in it when one comes to turn it about in one's mind that I do not think any words of mine can add to its force.

One more proverb occurs to me, "Everything comes to the man who can wait." Everything that can come of itself seems to obey this law. Success is not quite included here, because—at any rate in professional life—success can only come to the man who is fit to succeed. But granted the fitness (and I trust you will all fit yourselves for success before your student career comes to a close)—granted the fitness, I repeat, even in so crowded a profession as ours and so enormously difficult a place as London, success may fairly be expected to reward each man who can go on bravely struggling for a sufficiently long time and who will not lose heart.

Once more, it is a mistake to lose heart if any particular attainment seems to elude you. Say you decide to draw the figure, the most valuable auxiliary to high-class architectural draughtsmanship, and you find it very difficult, or you decide to draw perspective, and you find it very perplexing. The thing to do is not to give up, but to go on; and if the difficulty takes twice the time and twice the trouble which it appears to have cost some comrade, believe me the acquisition is more than twice as advantageous to you, and indeed more than twice as necessary for you as for him, so that your double trouble and double time have been well bestowed.

It is a mistake, if you have the opportunity of choosing what work you will do—an opportunity which to some extent a pupil often enjoys, though an assistant seldom—to stick too close to one thing. As far as possible, try to get a share in each sort of work that is in the office, and if it is work that you are not used to, and find it difficult to perform, so much the more instructive is it likely to prove. It is also a mistake to shirk the work you do not fancy. A young friend of mine complained to me once that he was given a good many letters to write when he thought he ought to be drawing. I pointed out to him that when he was in practice he would have shoals of letters to write, and that the art of writing a good business letter does not come of itself—far from it; so that he ought not to object to have the opportunity given him of practising his hand upon what is as necessary a piece of attainment as draughtsmanship.

It is a mistake to take up too much that is outside your profession. Every young man ought to have some athletic pursuit—cricket, tennis, cycling, walking, riding, boating, swimming. But it is distracting to take up or keep up too many such pursuits, or give too much time to those you select. Similarly, some hobby or pursuit that is not exactly architectural, such as a certain amount of reading and a certain amount of society, are good, and in moderation desirable. But learning a profession is an arduous task, and the men who will succeed best are those who give up their evenings night after night to pursuits akin to architecture, such as a school of art, the Architectural Association classes and meetings, or working up privately book after book on construction, materials, &c., or practising design, or drawing, or working at the joiner's bench. You will find in many other professions the demands made

upon the time and attention of students for years leave them little leisure for any outside pursuit whatever, and I do not think architecture requires less thorough devotion of time and power than does medicine, or law, or commerce, or that there is less to learn in architecture than those other professions.

It is a mistake not to sketch. Going and looking at architectural buildings is certainly better than not seeing them, but not of much permanent service. Photographs, whether you buy them, or, what is worse (because it takes so much time up), make them, are almost worthless as substitutes for the results of your own sketching and measuring. What you draw you look at—you, to some extent, understand, and you generally remember, while the drawing will always remind you of what you saw and tried to fix on your paper. Some young men are disposed when they get a summer holiday to boat or bathe or ramble about, as if their daily occupations as architects were of no more interest to them than those of a linendraper, and ought to be forgotten instead of being fostered at holiday times. Holidays are the best opportunities of architectural study possible, and, let me add, as soon as the first difficulty of sketching architecture from buildings is got over, sketching tours are the most enjoyable holidays possible. More can be learned in a fortnight's well-directed sketching than in months of work over books and drawings, and I will engage to say that the architectural traveller gets twice as much enjoyment out of any trip which takes him to cities and towns of interest as any of the ordinary travellers he will fall in with on his route.

It is a mistake to sketch or to study alone, if it can be avoided. *Noscitur ex sociis*, which, being freely Englished, is "Birds of a feather flock together"; and though a man's books and drawings are not bad companions, human comrades and friends are more useful, if only they be of the right sort. The best comrade for a beginner is one who is more advanced than himself, and, fortunately, the tyro, if teachable, is far from being the worst companion for the advanced student. Habits, circumstances and opportunities of course differ, and under certain conditions a man must study alone; but much time is often lost, and mistakes are apt to be made by those who work alone, and especially if they work without guidance. The opportunities of getting good instruction, and of associating with other students, are fortunately on the increase, and are so well known that I need not recapitulate them here; but I will add that studying together in this classroom has been, as I have reason to know, a beginning of student friendships, some of which have lasted through life.

On the choice of subjects of study I have not much to point out, but I cannot forbear saying that it is a mistake to despise surveying. Many students consider that they ought to prepare themselves for purely architectural practice, and for that only, and that everything which can go by the name of surveying is unnecessary, if not beneath them. They believe surveying to be, at any rate, wide of their line, and that it is to be accordingly shunned; but when they come to practice, they will find that a certain amount of surveying work will come in their way, and must either be done or handed over to better-prepared persons. I am not now speaking of quantities, the preparation of which is, to a large extent, a distinct work, but of all that relates to the examination and care of existing buildings. If you reflect that in any city or town for one new building there are hundreds already in existence, and that each of these hundreds is likely to be repeatedly surveyed, now for repair, now for alteration or enlargement, now for sale or purchase or rating, and possibly again after injury by fire, you will see that the mass of surveying work in the aggregate is considerable. Much of this can be better done by an architect than by any other person, and from time to time every architect is asked to make surveys under circumstances which make it clear that if he cannot or will not, valuable connections will go elsewhere. Nor is this all. Architectural practice is always fluctuating, and not infrequently the question of surveying work or none is a question of bread-and-butter or none. So do not consider that surveys are nuisances or interruptions, but pick up what you can about them, and, if a chance offers, by all means try to see a little land surveying. A very few days in the field will make the methods of working clear to any one who has not forgotten his trigonometry.

There is a companion mistake, one, I mean, of an opposite character, which is sometimes made, and which may as well be noticed. It is the mistake of neglecting design. Designing is the highest part of an architect's work, and it is work that he must be able to do. I am quite aware that it is no use for a beginner to try to design. He has no materials yet, and it would probably be more likely to do him harm than good if he attempted to originate out of the emptiness of his knowledge something that should represent a building. But designing does not come of itself, and yet many students go on for years accumulating knowledge and experience, and make no attempt to exercise themselves in design. Whenever one has made a piece of architecture one's own by studying, sketching, and measuring it, it is a wise course to try to design a variation upon it, making use of the same features, details, and ornaments but



rearranging them. This may be done if you like upon a single feature and an extremely small subject, and from such beginnings there are many ways of going on. What I wish to urge here is that it is a mistake not to begin.

The last mistake with regard to study that I feel bound to name is the mistake of not going to the Continent. This is, perhaps, not so prevalent as it was in the height of the Gothic revival time, when many good students believed that if they could thoroughly master English Gothic they need not attempt more. Now that Renaissance of some sort is being more generally practised, more men go to Italy and Greece, but still the number is small in comparison with the number of pupils and students. This, I repeat, is a great mistake, and if you say that it is a serious expense and absorbs much time—which are the two things that can be said against a continental tour—the answer is, that as to time it cannot be better spent, and as to money, there are few liberal professions where some expense is not absolutely necessary at some time, while the scholarships and studentships obtainable give to a few students in each year substantial assistance. Certain it is that this period of continuous study in other countries and under other suns seems more than anything else to make the difference between the mere draughtsman and the accomplished architect.

#### *Examination Mistakes.*

Every professional student has now to look forward, more or less, to examinations. There are many callings in which these have been pushed too far; happily that is not the case, at any rate as yet, with architecture. We have, however, enough examinations and competitions for prizes to bring mistakes in examinations well within our scope this evening. The prime mistake is to go up unprepared, in the hope that one may succeed by a fluke; or, perhaps, in the mistaken belief that one knows the subject so well that no preparation is needed. I have had a rather long and rather wide experience as an examiner in architecture, and I can assure you that the degree of unpreparedness with which some candidates are content is perfectly astonishing. Perhaps a specimen of the worst papers I ever had to correct might be more amusing than impressive; but I am sure that many students of schools of art offer themselves for examination simply on the chance that by a fluke they may get through, and have signally and dismally failed accordingly.

In the case of the Institute examination for Associateship, or that for the district surveyorship certificate, long and careful preparation are needed, and for each of these a spice of practical training is wanted. The would-be Associate must have some practice in design, and must make himself personally familiar with some specimens of ancient architecture, and the would-be district surveyor must have some experience of the supervision of building works. Similarly where drawings have to be made with a view to prizes offered by the Institute, the Association, or the professional papers, a candidate, in order to have any chance, and to gain any good from entering on the competition, ought to have some experience of drawing, and, if the prize be for a design, some notion of designing before he ventures to compete; though, as these are competitions and not pass examinations, failure to succeed does not involve the same discredit, and ought not to have the same discouraging effect on the candidate as failure in a pass examination.

It is a mistake, let me very emphatically say, for any student attending the courses about to begin here to avoid the final examination or any intermediate examination. Of course the prizes are only few, and as far as they are concerned the examination at the end of the session is competitive; but the certificates are given to as many as get more than a certain proportion of marks without limit of number, and so there is for each one a chance of having his ability and diligence recognised, and the opportunity which the class examinations offer of proving to yourselves that you have learned and retained a fair amount of what I try to teach, is in my opinion of great value.

In the examination-room it is a great mistake to fire off a piece of knowledge that has nothing to do with the question, simply because you know it. As, for example, suppose you have carefully got up the tracery of windows of different periods of English art, and no question is asked about tracery, but a question is asked about mouldings. If in answering that question you drag in the tracery and spend half an hour over it, you do more harm than good. No examiner who knows his work will give a single mark for statements that are irrelevant and do not answer any part of the question, so you get no marks for your tracery; meantime the writing and sketches have wasted you half an hour, during which time had you been answering other questions to the best of your ability, you would have been earning marks.

Next to the mistake of lugging in irrelevant matter by the head and shoulders, comes the mistake of giving too much time to one or two questions. A paper in which there is no proportion among the answers is one very difficult to mark, but which, from the very nature of things, is sure not to get so many marks as one containing the same amount of writing and

sketches, but where more questions are taken, and a clear, condensed, yet correct answer given to each. It is a mistake, also, in architectural examinations not to illustrate the paper of answers by sketches whenever possible. If, unluckily, you cannot make tolerable sketches, it is very much to be regretted, and you had better stick to written replies; but if you have any reasonable mastery of the pencil, do not forget to introduce sketches, and the better they are the better your paper, and the higher will it be marked. It is a mistake—and one often made, I fear—to suppose that examiners in our professional examinations are anxious to trip you up, and that they lie at the catch and will be heartily glad if, by some clever and misleading device, they unfairly entrap you into a blunder. The object of the examiners is to bring out what you know and what you do not know, and it is with an anxious sense of serious responsibility that they carry on this important work. Rely upon it, they had rather be convinced that you are fit to pass than that you must be turned back. But rely, also, upon it that they will not pass you till they are so convinced.

It is a mistake to suppose that any answer which is not wrong will do. If a question involves a difficulty, the answer which evades that difficulty is very differently considered from that which attempts it, even if it should fail to solve it perfectly. For example, in a recent examination I gave the dimensions of a bay of flooring fit to carry a certain weight per foot, and required an iron girder to be calculated of a fixed span and strong enough to carry that bay. I got more than one reply in which the calculation was attempted, and was carried out on the right method; but the right result did not come out owing to errors or omissions in calculating. I got one reply, in which, after stating the number of tons to be carried, the answer went on saying, "I should adopt a rolled iron joist, so many lbs. to the foot." This answer was probably arrived at by some rule-of-thumb method; it was not far from being practically correct, but there was no attempt made to work out the calculation, which was the difficult part of the question, and of course I could not give such good marks to this reply, which avoided the difficulties, as to those in which the students had tackled them to the best of their ability and by proper methods.

*(To be continued.)*

#### YORK ARCHITECTURAL ASSOCIATION.

THE third excursion of this Association was made last week to Middlesbrough. On arriving at that town the members were met by Mr. Walter H. Hoskins, who led the way to the Municipal Buildings recently erected from the designs of Mr. G. G. Hoskins, of Darlington, selected in competition. Mr. W. Hoskins conducted the members round the buildings and pointed out the principal features of interest. The design is thirteenth-century Gothic. The Town Hall occupies the northern part of the site bordering on Corporation Road, and is separated from the Municipal Buildings by a glass and iron covered carriage-way. Over the principal entrance to the Town Hall stands a figure of St. George slaying the dragon, whilst surmounting all is a picturesque tower 170 feet high. The Municipal Buildings are arranged round a quadrangle, which is used as a drilling-ground for the police and fire brigade. The buildings provide ample accommodation for the Council, the police, fire brigade, free library, reading-room, water board and union offices. On the south side stands the council chamber, 55 feet by 35 feet, admirably fitted on the semi-circular plan for the accommodation of the Corporation. It is adorned with oil-paintings of four of the principal benefactors of the town.

#### MONTROSE MEMORIAL, EDINBURGH.

THE memorial proposed for erection in St. Giles's Cathedral, Edinburgh, to the memory of the Marquis of Montrose, who was executed during the civil war in 1650, has been completed. The design was prepared by Dr. Rowand Anderson, in the Renaissance style of the seventeenth century, and is suggestive of the form the monument would have probably taken had it been erected at the time Montrose was buried. The principal feature in the design is a semicircular arch deeply recessed, having in the recess a sarcophagus, with black marble bier carrying the recumbent figure in white marble of the marquis. The sarcophagus, mounted on a pedestal, is of a highly ornate character. The archway is flanked by two Corinthian pillars in black and gold marble, with caps and bases of alabaster. In the centre of each of the pillars is an alabaster wreath. These pillars are surrounded by a frieze, entablature, and cornice with ornamented pinnacles. The frieze is decorated with floral wreaths and panels. The latter contains one of the Montrose mottoes, "N'oubliez," while the rose of the Montrose and the clam-shell of the Grahams are also worked into the design. In the frieze immediately above



the pillars is a panel with the favourite device of the marquis—a lion leaping from one rock to another, separated from it by a chasm, with the motto "Nil medium." In the spandrels of the arch are circular panels containing shields—one having three roses, and the other three clam-shells. Rising over the cornice and between the pinnacles is a large ornamental panel, in which is quartered the full coat-of-arms of "The Graham," flanked by richly-carved pillars and dolphins, and surmounted by a pediment. In this pediment is another of the Montrose crests—a gloved hand grasping a porcupine, with the motto "Col senno e con la mano." The monument is finished off by another panel, which rises over the pediment, containing yet another crest—an eagle destroying a stork. The background of the arched recess is divided into three large panels, formed with alabaster mouldings, and in the centre panel, enriched with carved work, has been placed the inscription. The monument, which is well executed in coloured marbles and alabaster, with elaborate gilding, measures 9 feet across and 16 feet in height. Messrs. J. & W. B. Rhind were the sculptors. The recumbent figure of the marquis grasps a bronze sword.

### ROMAN SILCHESTER.

A VISIT was paid to Silchester last week by the Berkshire Architectural Society, under the auspices of Mr. Slingsby Stallwood, of Reading.

In the course of an address Dr. Stevens, the hon. curator of the Reading Museum, described Silchester as one of the fifty walled towns that existed in Britain during the Roman occupation. Those walled camps were remarkable, inasmuch as they had the control of the grand roads which the Romans made throughout the country, each camp marking the beginning or ending of a journey. The area of the Roman city of Silchester was about 120 acres, and the walls were a mile and a half in circumference; and the outline of the walls could be traced completely. The walls in their best days were 14 feet or 15 feet thick, and something like 20 feet high; but they varied, having been probably built at different times. There was a grand entrance at the south gate, which must have reared up at least 25 feet. The walls were made principally of flint, put together with extremely strong mortar, hardened with powdered flint and brick; and at intervals of about 2 feet 6 inches were courses of large "bonding tiles" of sandstone. The camp had four great entrances, placed by the points of the compass, as was generally the case with Roman cities. The east gate was approached by the Londinium (London) road, *via* Staines (Pontes), away over Bagshot Heath, where it was known as "The Devil's Causeway," and across the Loddon. The road from the north gate ran into Norfolk, passing through Streathley by the Ickneild way. The west road passed on, in the direction of Newbury, to the station called Spinæ (Speen), and on to Cirencester, another branch going away to Marlborough and thence on to Bath.

The ancient city without question had contained many fine buildings, but he had no doubt that it consisted to a very large extent of mud hovels of but one storey, covered with thick thatch. The supposed house of the Quæstor, the foundations of which were uncovered by Mr. Joyce, was described. It measured 98 feet by 127 feet, and had a gallery running round a courtyard, and on two of the sides of the gallery rooms opened out. This house had a double hypocaust, heated by one furnace, under the two main rooms, which measured 21 feet by 16 feet. One was supported by pillars, and the other rested on the radiating hypocaust, as shown in a diagram. One of the rooms was paved with hexagonal and octagonal tiles; and under one of the floors was found a "strong-box," which had no doubt been used for the storage of the treasure. Here also was found a bronze strigil—used for scraping the drops off the skin after bathing, thus answering the purpose of a rough towel. Instruments were also found for making mosaic pavements, proving that some of the finer tesserae were manufactured in the town, and not imported. The party then viewed the site of the vapour bath, and the hypocaust which still remains in block 2, and the passage adjoining, which retains its original tessellation. The forum, Dr. Stevens explained, originally contained an open market-place (where business was transacted), which was surrounded by a covered ambulatory. The foundations on the east and north sides were principally those of shops and offices, on the west being the public buildings, which were alternately square and apsidal. The extreme west range included an assembly-room, and in the centre the curia, which was a court in which a prætor probably presided. Next came the tabularium, in which the records were probably kept, and a seal had been found here. At the south corner stood the ærarium, or treasury, which was probably presided over by the Quæstor, and in the ruins Mr. Joyce found a bronze "eagle," buried under some charred remains in such a position as to indicate that it had fallen from the roof, where it might have been hidden by the soldiers who had it in charge, to prevent its falling

into the hands of the enemy. This "eagle"—a very unique specimen—appears to be of an Assyrian pattern; the wings had been torn off, and it had been wrenched from the standard. Next came the basilica, or hall of justice, which is also apsidal, for the use of the bench. The bema or tribunal is also well marked. It must have been a splendid building, Purbeck marble having been used in some parts. It was 60 feet in width, and evidently had originally an apse at the west end, which had been altered into a square. Between it and the market-place was a very handsome porticus, supported by fine Corinthian pillars, remnants of which still lie about. At the east of the basilica were other rooms, alternately apsidal and square, which were no doubt used as "Government offices." Then came the shops, oyster shells indicating where the fish-monger had lived, weights, scales, &c., the shop of the butcher, and a quantity of broken glass suggesting the existence of a caupona or wine shop. On the north side a place was pointed out which is supposed to have been the prison. The temple, on the south of the forum, was a polygon of sixteen sides, with an outer ambulatory, the whole having a diameter of 60 feet, and walls 3 feet thick. No altar or statuary had been found there.

At the amphitheatre, Dr. Stevens stated that the platform on which they stood was the arena, so-called from sand having been used after the manner in which sawdust is employed in circuses. It is enclosed on the right and left by mounds, gradually sloping upwards, and considered to have contained five tiers of seats, capable of holding several thousand persons. There were two vomitoria—places of entrance and exit, and the dimensions were 150 feet by 120 feet. In the size it differs somewhat from the amphitheatre at Cirencester, which is 148 feet by 134 feet, that at Dorchester measuring 219 feet by 138 feet. No masonry is visible in the Silchester amphitheatre.

### OWENS COLLEGE, MANCHESTER.

THE report of the Council was submitted at the half-yearly meeting held on Tuesday. It states that in July the Council received a letter announcing a further gift of 25,000*l.* from the residuary legatees of Sir Joseph Whitworth, Bart., to be applied to the Museum Building Fund. For this munificent gift, which goes far towards relieving the college from the heavy responsibility entailed by the erection of the museum buildings, the Council have tendered their most grateful acknowledgments to the donors. Visitors to the college will observe the beauty of the groining in the archway and staircase; its cost was greater than the estimate, and the architect has contributed 250*l.* towards meeting this. The Council have expressed their sense of the beauty of the work done, and of Mr. Waterhouse's generosity. The geological portion of the museum was formally opened to the public on June 8. Considerable progress has been made with the fittings of the upper storeys of the building, which are destined to hold the collections in zoology and botany. For some years the accommodation provided in the physical laboratory has been felt to be sorely in need of extension. This laboratory was from the first inadequate, and the increasing importance of the subject and the rapid growth of the number of students in the department have at last obliged the Council to deal with the necessity of the situation. Two large rooms in the basement, and contiguous to the existing laboratory, were set free by the removal into the new museum of the geological specimens and the large collection of minerals. Plans for the conversion of these rooms, which had been laid before the Council by the late Professor Balfour Stewart, have since been carefully matured, and a separate building for an electrical laboratory has been planned by Professor Schuster and Mr. Henry Wilde, F.R.S. These works are being rapidly proceeded with, and in a short time the Council believe that the college will possess a physical laboratory worthy of the name. The Council acknowledge the great assistance they have received from Mr. Wilde, who consented to join the committee charged with carrying out these extensions, and who has offered a liberal contribution towards their cost.

Early in the year the Council requested Mr. Waterhouse to prepare plans for utilising the large space at the north end of the main building, set free by the removal of the hoist, which, after the transfer of the natural history collections, was no longer necessary. These plans, which include (1) a convenient and much-needed access from the old to the new buildings, and (2) the provision of several excellent rooms, were in due course approved, and the consequent reconstruction has been to a great extent effected during the long vacation. The Council have also added greatly to the accommodation for the rapidly-growing library of the College (which now contains upwards of 45,000 volumes) by erecting a staircase between the present library and the large central room in the attic storey. The space thus annexed will probably give shelving room for 15,000 volumes.



A letter was read from the residuary legatees of Sir Joseph Whitworth stating that they had learned that a general hospital, in close connection with the college, was much needed, in which the students may receive practical instruction in medicine and surgery, and, as a commencement of such a hospital, the legatees will make over a sufficient site for the building, and contribute not less than 35,000*l.* towards the cost of the erection and furnishing the first portion, in addition to providing an annual income of 1,000*l.*

### THE GLASGOW INSTITUTE OF MEASURERS.

THE eighth annual meeting of this Institute was held on Monday, Mr. David Robertson, president, in the chair. It was reported that consideration had been given to the clause in estimates regarding the pricing of measurements at the rates and in proportion to the lump sum of offer, and the bearing of checking the cash extensions in estimates on that clause. Several legal decisions have been given affecting the matter, and a clause has now been prepared, with the advice of a legal gentleman, to meet the circumstances. This clause was submitted for the guidance of members. The three bodies interested in the preparing of rules for the measurement of wrightwork have not yet agreed upon a uniform mode, and have not sanctioned any rules. A joint committee is now engaged in drafting rules for the measurement of painterwork. At the examination on professional practice conducted by the Institute, seven young men in the offices of members have been successful, each of whom received a prize and certificate. The office-bearers for the ensuing year are:—President, John Dansken; vice-president, Robert Scott; secretary and treasurer, William Howatt, 146 Buchanan Street; auditors of professional accounts, David Robertson and Michael Cunningham; other members of Council, James Howatt, John Morrison, Daniel S. Wilkie, Robert Reid, John H. Ramsay, Alexander Knox, and James D. Herbertson.

### COMPETITION FOR COMMISSIONS.

A PAPER written by Mr. J. W. Yost, on the "Methods in Use for obtaining Professional Work," for discussion at the annual convention of the Association of Ohio Architects at Cleveland last August, appears in the last number to hand of the *Chicago Inland Architect*, as follows:—

In general, there are two classes of clients—those who come to us and those whom we seek. The former class of clients—here's to their health, long life, great prosperity and wonderful increase—this paper bids them God-speed and a good-day. The latter class includes a much larger portion of our clientage than it is pleasant to contemplate. In what way can it be diminished, and the expense of seeking work reduced? Let us examine some of our practices and see if we would not be as well off if we abandoned or changed a few of them. Where there is work of a desirable nature which does not come to us, we either call, write, or send for the purpose of obtaining it. The first object of the call or correspondence is to secure the work forthwith. If it can be thus obtained, at proper compensation, it comes sufficiently near the unsought work to need no further mention here. Our troubles would be few if all the work went to the first applicant. The anxiety to be first might be intense for a time, but it would be soon over.

It is probable that when we call, send, or write, we learn that some other architect has done the same thing, or is expected to. Perhaps several have already informed the parties of their desire to be architects of the proposed structure. It may be that it has already been a determination to have suggestions or designs from different applicants—possibly a competition.

It is probably a rule with few exceptions, if the architect believes his chance would be improved thereby, that he suggests a competition. Any one will get the work without a competition if he can, but when he finds that it cannot be thus secured, what is he to do? If he believes himself an architect superior in ability, so far as that particular building is concerned, and yet feels that he is at a disadvantage as far as influence goes, what is to prevent him suggesting a competition? At first sight it appears to be his duty to do so. Is he to deliberately allow a rival to outreach him without making his greatest effort and putting his "best foot" forward? He can, perhaps, by means of a competition, outreach his rival's influence or acquaintance, with a brilliant or novel design, or, by thus gaining time, he may find some way to bring to bear some influence to balance the acquaintance of his competitor.

But what is the result of competition under the supposed circumstances? Nobody gains anything and everybody loses by it. The inferior architect whose influence was feared, as a rule, wins the competition, and both are losers by reason of the competition to the extent of the cost of sketches. While I

know it is difficult to believe, it nevertheless is true, that personal influence decides nine out of every ten competitions where the competitors are known. I believe I have engaged in as many competitions, before as varied a cliental, and for as many different kinds of buildings, as any one of my age, and I am willing to say of such competitions, that nine out of every ten of not only those I have engaged in, but of all others I have observed, have been determined outside of the merits of the designs submitted. I say this, too, without casting any reflection upon either my competitors, myself or our clients. Those to whom we submit designs are not, as a rule, much posted in regard to architectural drawings, and it is a part of human nature to pay attention to and believe a friend rather than a stranger; and where there is not the slightest intention of being unfair this very quality enables men to take hold of what is presented with influence and acquaintance rather than that which stands alone upon the merit it contains. This same element of human nature is illustrated in the attachment of successive generations of the same family to the same church or political party.

Competitive designs do not usually differ so much in quality that the difference in merit of the various plans can be detected by an unprofessional eye, and made sufficiently clear to be unquestionable; and I am not sure that it would be greatly better if an expert were to render the decision, provided he is intimately acquainted with one competitor and the other is unknown. He who cannot secure work without competition will seldom find himself better off after a competition he institutes to gain it. We are likely to gain nothing through competitions of our own making.

A procedure which will be as well for all of us and for each of us, and often avoid unnecessary expense, one which has been frequently adopted by public authorities and often by individuals, is something like the following:—When different architects apply, or are desired to apply, or be furnished an opportunity to apply for a commission upon any proposed building, let a time be set when each or all applicants will be heard, giving each one an opportunity of presenting for examination whatever he may have to offer which he believes will tend to satisfy the proposed client that he is the proper person for employment. He need not present drawings at all unless he wishes to; or, if he does, he is not required to go to the expense of preparing drawings for that particular building unless he chooses. Let it be understood that whoever is employed is to prepare suitable drawings afterward. In short, let an architect be selected rather than a plan adopted.

I am confident that this will be found the better way. It will effect the end desired by both public officers in charge of building enterprises—that of being fair to everybody and giving all an equal opportunity—and will afford to all who desire to apply an equal opportunity without requiring any expense, except what each one for himself chooses to make. The adoption of this method will very greatly reduce the number of competitions, in fact, will surely benefit both client and architect.

It is seldom, indeed, that sketches presented in competition are carried into execution without first being changed to meet requirements unknown, and too numerous to be made known, to the architects in the competition, so that competitions do not succeed in securing a building plan. The only thing really accomplished is the giving of all an equal chance, which as aforesaid can be as well done without their delay and expense. This is, of course, not meant to cover those works of great importance where a comparison of ideas is highly desirable, and where no man's reputation or experience is sufficient guarantee of his satisfactory solution of the problem.

The great majority of competitions of an unnecessary character, while it may be perceptibly reduced by carrying out the suggestion I have made, will in some quantity be with us despite our protests. Not all people will at once give us what to them is an inexpensive amusement—that of looking over the suggestions—sketches of a number of different architects—all striving to solve most satisfactorily the same problem. While it is kept up by the public for its information or entertainment, it ought not to be at the expense of the profession.

If people will indulge themselves in the pleasure of having a number of suggestions for the same building, they ought to pay for the fun. The public ought, by the most practical means, to be taught that this sport is expensive to somebody. Architects cannot live on competition work done at the same rate as for work where no such expense is necessary, and the general business of the profession ought not to be loaded with the financial embarrassments induced by competitive work. We ought to make that class of work pay its own way. A fair compensation for competitive sketches will not fall below one per cent. of the cost of the proposed structure. The five per cent. rate for professional work ought, in all fairness to all parties concerned, to be increased to six per cent. for work gained in competition. Our schedule of charges ought to be amended to that effect. This will put the expense of the competition where it belongs. It will, when known to be the rule



of the profession, cause many to hesitate before indulging in such a luxury. I dare say it would nip in the bud three-fourths of all the competitions we would otherwise be unable to avoid. Competitions are proper in their place, and are useful for certain important purposes; but the burden of such even as are desirable should not be borne by the profession, and I am satisfied that the public will have little to do with most of them when it learns their real cost and is obliged to pay it.

### A LEANING STEEPLE AT COVENTRY.

IN the course of a letter to the *Times* on church restoration, Lord Grimthorpe, referring to the above subject, noticed in *The Architect* of last week, says:—

I have received a printed letter from a gentleman at Coventry, with the extraordinary information that the architect who has been "restoring" (which means rebuilding the outside of) the great steeple of St. Michael's has left the top leaning 4½ inches to the north-west, though, for reasons which he gives, it must have been well known to be so. This is nearly twice as much as the inclination of the top of Salisbury; and indeed far more, for Salisbury is much higher, and the base a great deal wider besides; for the narrowness of the Coventry tower was its conspicuous defect, and might easily have been cured now, as I wrote several years ago in one of the architectural papers.\*

Instead of curing it by enlarging the buttresses, if they did not rebuild it altogether, they—i.e., the architect and those who let him have his way—persisted in rebuilding it all exactly as it was; and now they want to get up another bad tower somewhere to carry the bells, which I could easily have made the other do if it had been built properly.

This craze for copying glaring mistakes and results of former poverty and ignorance is doing as much harm in one way as the destructiveness of Wyatt, the fashionable church-restorer of the end of last century, did in another. It has now spoilt Peterborough for another five centuries probably. Manchester is ashamed of the stupid rebuilding of its miserable cathedral tower exactly as it was before, and is crying out for another. Our architects—employed and interloping—and the antiquarian lunatics, of course, wanted to repeat all the worst work of the worst time of the Gothic architecture at St. Albans, except that Scott and his son did want the high roofs, which they have now got.

To be sure, some of them have hit on the better plan, perhaps, of writing grand phrases about "conservative restoration" in their reports to committees, and then committing any radicalism that they like—a practice not unknown to greater people than architects in these days.

### CHURCH BUILDING AND RESTORATION.

**Ashted.**—The church of St. James has been reopened after undergoing alteration and repair. The main walls have been underbuilt upon a secure foundation of concrete, while the decayed timbers of the roof, which is of great span, have been taken out and reinstated. The old ceiling has been taken down and renewed, and the old floors repaved with wooden blocks laid on concrete. The chancel has been paved with encaustic tiles and the steps rearranged, and an oak reredos has been made by Messrs. Jones & Willis from the design of the architects, Messrs. Osborn & Reading, of 13 Bennett's Hill, Birmingham. Messrs. Jeffery & Son were the contractors.

### SCHOOL BUILDINGS.

**Cleckheaton.**—The memorial-stones of a Wesleyan chapel and Sunday-schools have been laid. The chapel and schools are being built in Whitcliffe Lane. The chapel will seat 870 people, and the estimated cost of the undertaking is a little over 6,000*l.* The building has been designed by Mr. W. Henry Howorth, architect, Cleckheaton.

**Halifax.**—Plans have been prepared by Messrs. Horsfall & Williams for a Congregational church at Heath, Halifax. It is proposed to build the school first, to serve also as the church. The large room for church purposes will be on the first floor, and will accommodate 440. The school will be on the lower floor, and will accommodate 250. There will be four classrooms.

**The Successful Students** in the art competition for the "free studentship" prizes, instituted for Paisley by Mr. W. B. Barbour, M.P., for the promotion of art study, are Mr. J. Robertson, Mr. D. Bett, Mr. J. Wallace, Mr. H. Anderson, Mr. W. McLauchlan, Mr. J. Sandilands, Mr. H. Baird, Mr. M. Kelly, and Mr. J. Davidson.

\* *The Architect*, Jan. 22, 1886.

### GENERAL.

**A Picture, Welsh Scenery**, painted by Mr. Aborn, son of the surveyor of Eton College, and which was exhibited at the Royal Academy this year, has been submitted to the inspection of the Queen.

**The Works of Art** intended for the autumn exhibition of the 19th Century Art Society have to be sent in on Monday the 8th inst.

**A Sketching Club** is being formed at Ardrossan, and periodical meetings are to be held at which the work done by the members will be submitted.

**An Excellent Portrait** of the President of the Architectural Association, Mr. H. D. Appleton, F.R.I.B.A., appears in the October number of the A.A. Notes.

**The Monument** erected in Folkestone cemetery by the German nation, to the memory of the men belonging to the German navy who were drowned off Sandgate by the sinking of the *Grosser Kurfurst* on May 31, 1878, has been restored at the expense of Sir E. Watkin, M.P.

**The Stained-glass Window** presented to Manchester Cathedral by Mr. Christopher James Schofield, as a memorial of General Gordon, was unveiled on Saturday. The window was designed and executed by Messrs. Wilson & Whitehouse, of London.

**An Ornamental oak lych gate**, designed by Mr. Walter F. Lyon, and presented by Mr. R. Twining, of Bitteswell, has been erected at the parish churchyard.

**A Stained-glass Window** is to be placed in St. Peter's Church, Levenshulme, as a memorial of the late rector, the Rev. E. C. Hore.

**A Sum** of 5,000*l.* has been offered by a friend of Forbes to aid in providing a cottage hospital, on condition that the town provides a site of not less than three acres, and that a further sum of 2,000*l.* be contributed by the community.

**The Technical Scholarship** in engineering at the Mason College, Birmingham, annually offered by Messrs. Richard Tangye & George Tangye has been won by Mr. A. E. Jackson; also an extra technical scholarship of 30*l.* is awarded to Mr. J. J. Podesta.

**A Convalescent Home** is proposed to be built in Durham, for the friendly societies of Northumberland and Durham, and a committee has been formed to inaugurate the scheme.

**A Bazaar** was opened on Thursday last week, at Monk Fryston Hall, in aid of the restoration fund of the ancient church of Monk Fryston.

**Stratton Church**, which has been restored under the direction of Mr. J. St. Piers Aubyn, has just been reopened.

**A Church** is to be erected at Broadbottom-in-Mottram, at an outlay of 2,700*l.*

**The Folkestone Magistrates** on Saturday decided not to grant a theatrical license for the new pier until several means of exit are added, the doors made to open both ways, and other structural alterations made. Some weeks must elapse before these alterations can be carried out.

**The Pier** which is to be erected at Southend, at a cost of about 50,000*l.*, will replace the old wooden structure, considerably over a mile in length, which has done service for the last fifty years.

**The Dysart School Board** have instructed Mr. Hyslop, architect, to look out for a site for the erection of an infant school in the Sinclairtown district.

**Clochdy Llangyfelach** is another instance, as is pointed out by a correspondent, of a detached tower to a parish church.

**It is Proposed** to lay out St. John's Churchyard, Liverpool, as public grounds. The cost is estimated not to exceed 4,000*l.*

**The Trustees** of the Princess Alice Orphanage, New Oscott, have received from the foundresses of the Nechells Charities, Birmingham, a cheque for 3,000*l.*, which is to be devoted to the erection and partial endowment of a home for orphan girls at the orphanage.

**The Restoration** of Croyland Abbey was begun on Thursday last week by Mr. Thompson, contractor for the works at Peterborough Cathedral, under the direction of Mr. Pearson, R.A. The work will cost about 3,000*l.*, nearly the whole of which has to be forthcoming.

**St. Dunstan's College**, Catford Bridge, designed by Mr. E. W. Clifton, architect, was formally opened on Monday.

**A Sum** of 2,400*l.* has been collected for the erection of a memorial in the new cemetery at Evère, Brussels, over the remains of the officers and men who fell in the Waterloo campaign.

**Mr. G. W. D. Strange** informs us that he has opened an office at New Barnet, where he intends to practise as an auctioneer, surveyor, valuer, &c. He has resided nineteen years in the district, and has an intimate knowledge of property in the neighbourhood.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, Ltd.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, OCTOBER 5, 1888.

## EDITORIAL NOTICES.

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## CONTRACTS OPEN.

ASHTON-UNDER-LYNE.—For Building Two Cottages. Messrs. J. Eaton & Sons, Architects, Ashton-under-Lyne.

BERKHAMSTED.—Oct. 17.—For Building Shops, &c., for the Co-operative Society. Mr. J. F. Goodey, Architect, 2 Victoria Chambers, Colchester.

BRADFORD.—Oct. 8.—For Building Warehouse. Messrs. Brayshaw & Co., Architects, Bowling Old Lane, Bradford.

BRADFORD.—Oct. 9.—For Building Shops and Business Premises, Kirkgate. Messrs. Empsall & Clarkson, Architects, 55 Tyrel Street, Bradford.

COVENTRY.—Oct. 7.—For Building Offices, Shedding, &c. Mr. Herbert W. Chattaway, Architect, Trinity Churchyard, Coventry.

CWMDANDDWR.—Oct. 15.—For Vicarage, Outbuildings and Approach Road. Mr. S. H. Cowper-Coles, Architect, Rhayader.

DUNWICH.—For Additions to Grey Friars. Mr. E. H. Bisshopp, Architect, 32 Museum Street, Ipswich.

ENDON.—For Semi-detached Houses. Messrs. Scrivener & Sons, Architects, Howard Place, Hanley.

GUILDFORD.—Oct. 10.—For Building Cookery Classrooms to Two of the Board Schools. Mr. W. G. Lower, Architect, 12A High Street, Guildford.

HORNSEY.—Oct. 8.—For Supply of Rolled Iron Joists. Mr. T. de Courcy Meade, Surveyor, Southwood Lane, Highgate, N.

HORSHAM.—Oct. 11.—For Additions, &c., to Town-hall. Mr. J. P. Gates, Architect, Dolphin Chambers, Shoreham.

IFRIDDIOEDD.—Oct. 5.—For External Cementing of Residence. Mr. R. Grierson, Architect, Bangor.

LEADENHALL MARKET.—Oct. 19.—For Underground Urinals, Water-closets, &c. Mr. Henry Blake, Sewers Office, Guildhall, E.C.

LIMERICK.—Oct. 25.—For Building Constabulary Barrack. Office of Public Works, Dublin.

MANCHESTER.—Oct. 5.—For Building Church and Schools, Moss Side. Messrs. Isitt & Verity, Architects, Sunbridge Road, Bradford.

PENMAENMAWR.—Oct. 6.—For Rebuilding Parish Church of Dwygyfylchi. Mr. E. M. B. Vaughan, Architect, Cardiff.

PRESTON.—Oct. 8.—For Building Medical Hall. Messrs. Myres, Veevers & Myers, Architects, 15 Chapel Street, Preston.

SEATON SLUICE.—Oct. 5.—For Building Two Coastguard Houses. The Director of Works Department, Admiralty, 21 Craven Street, Charing Cross.

STANNINGLEY.—Oct. 8.—For Building Board Schools, Outbuildings, and Boundary Walls. Mr. W. Lee, Clerk to the School Board, Leeds.

YORK.—Oct. 9.—For Building Mortuary at Fever Hospital. Mr. E. G. Mawbey, City Surveyor.

## TENDERS.

### ABERDEEN.

For Carrying Out Improvements at Ferryhill, for the Aberdeen Town Council.  
Pringle & Slessor . . . . . £382 0 0

### ASHDOWN PARK.

For Erection of Lodge, at High Beeches, Ashdown Park. Mr. S. W. HAUGHTON, M.S.A., Architect and Surveyor, East Grinstead and Tunbridge Wells.  
W. PLEDGE, East Grinstead (accepted) . . . £215 17 0

For Erection of Lodge at Wytych Cross, Ashdown Park. Mr. S. W. HAUGHTON, M.S.A., Architect and Surveyor, East Grinstead and Tunbridge Wells.  
W. PLEDGE, East Grinstead (accepted) . . . £283 0 0

### BELLAGIO.

For Erection of Entrance Lodge, near Read's Farm, with Entrance Gates and Fencing, for the Bellagio Estate Company. Mr. WALTER J. EBBETTS, F.R.I.B.A., Architect, Savoy House, 115 Strand.  
H. BAYLIS, Highbury (accepted).

For Erection of a Bungalow on Plot 62, St. Margaret's Avenue, for the Bellagio Estate Company. Mr. WALTER J. EBBETTS, F.R.I.B.A., Architect, Savoy House, 115 Strand.  
H. BAYLIS, Highbury (accepted).

### BOURNEMOUTH.

For Formation of Roads, Upper Parkstone Estate, West Bournemouth, for the National Liberal Land Company. Messrs. C. T. & W. H. MILES, Surveyors, Observer Chambers, Bournemouth.

W. Hoare, Bournemouth . . . . .	£1,245	0	0
G. T. Budden, Newtown . . . . .	1,052	7	1
J. White, Bournemouth . . . . .	1,019	0	0
S. Minty, Bournemouth . . . . .	998	10	0
W. A. Guy, Newtown . . . . .	885	0	0
G. Troke, Winton . . . . .	865	0	0
SAUNDERS & CO., Bournemouth (accepted) . . .	829	4	5
C. Bantem, Parkstone . . . . .	820	0	0

### BRISTOL.

For New Mixed School for 360 children, for the Bristol School Board. Mr. W. L. BERNARD, Architect, 39 Broad Street, Bristol. Quantities by Architect.

	Including foundations.	Foundations alone.
E. Gay, Bristol . . . . .	£4,035 0 0	£724 0 0
J. Williams & Son, Bristol . . . . .	3,985 0 0	730 0 0
W. Mereweather, Bristol . . . . .	—	712 0 0
E. Walters, Bristol . . . . .	3,943 0 0	600 0 0
Beachim & Balmont, Bristol . . . . .	3,918 0 0	656 0 0
W. Church, Bristol . . . . .	3,825 0 0	575 0 0
T. R. Lewis, Bristol . . . . .	3,800 0 0	620 0 0
Stephens & Bastow, Bristol . . . . .	3,759 0 0	—
H. J. Rossiter, Bristol . . . . .	3,750 0 0	527 0 0
J. E. Davis, Bristol . . . . .	3,730 0 0	679 0 0
A. J. Beaven, Bristol . . . . .	3,690 0 0	679 0 0
W. Cowlin & Son, Bristol . . . . .	3,673 0 0	660 0 0
G. Humphreys, Bristol . . . . .	3,666 0 0	634 0 0
Forse, Bristol . . . . .	3,650 0 0	675 0 0
R. Facey, Taunton . . . . .	3,595 0 0	597 0 0
Eastbrook & Son, Bristol . . . . .	3,574 0 0	698 0 0
C. A. Hayes, Bristol . . . . .	3,570 0 0	611 0 0
A. Hill, Bristol . . . . .	3,530 0 0	586 0 0
S. Turner, Bristol . . . . .	3,490 0 0	537 0 0
J. PERROTT, Bristol (accepted) . . . . .	3,490 0 0	573 0 0



## DERBY.

For Improvement Works, New Chester Street, Derby. Mr. HARRISON, Borough Surveyor.

J. Tomlinson, Derby . . . . .	£226	0	0
G. TODD, Derby ( <i>accepted</i> ) . . . . .	212	18	2
Surveyor's estimate . . . . .	220	0	0

## DUBLIN.

For Superstructure of Four Street Bridges, Dublin, for the Joint Committee of the Dublin, Wicklow, and Wexford Railway.

T. Grendon & Co., Drogheda . . . . .	£16,250	0	0
J. Tildesley, Willenhall . . . . .	15,530	0	0
Westwood, Baillie & Co. . . . .	13,068	0	0
M. Pitts, Leeds . . . . .	12,692	0	0
A. Handyside & Co., Limited . . . . .	12,637	9	0
Head, Wrightson & Co., Stockton-on-Tees . . . . .	12,413	0	0
W. Spence, Dublin . . . . .	12,180	0	0
E. C. & J. Keay . . . . .	12,000	0	0
Darlington Waggon and Engineering Co. . . . .	11,895	12	6
Arrol & Co., Glasgow . . . . .	11,665	5	3
Arrol Bros., Glasgow . . . . .	11,637	5	6
A. Thorne . . . . .	11,502	0	0
Heenan & Frowde, Newton Heath . . . . .	11,259	0	0
T. Woodall, Dudley . . . . .	11,139	0	0
Cleveland Bridge Co., Darlington . . . . .	10,895	2	10
D. & W. GRANT, Belfast ( <i>accepted</i> ) . . . . .	10,105	15	0

## EXETER.

For New Drainage System at the City Workhouse, for the Corporation of Guardians. Messrs. WILKINSON & WARREN, Architects, Surveyors to the Guardians, Post Office Chambers, Exeter. Quantities supplied.

Hull, Southampton . . . . .	£1,793	0	0
Scadding & Son, Exeter . . . . .	1,350	0	0
Tree & Holley, Exeter . . . . .	1,279	0	0
Hubber & Son, Exeter . . . . .	1,080	0	0
J. G. Stephens, Exeter . . . . .	1,070	0	0
Coles, Exeter . . . . .	1,060	0	0
Phillips, Exeter . . . . .	1,005	0	0
SETTER BROS., Exeter ( <i>accepted conditionally</i> ) . . . . .	998	0	0
Surveyor's estimate . . . . .	1,062	10	0

## EAST GRINSTEAD.

For Erection of Dwelling-house and Shop, London Road, East Grinstead, for Mr. G. Arnold. Mr. S. W. HAUGHTON, M.S.A., Architect and Surveyor, East Grinstead and Tunbridge Wells.

J. Morris, Ashurst Wood . . . . .	£497	0	0
CHARLWOOD BROS., East Grinstead ( <i>accepted</i> ) . . . . .	484	0	0
A. Foster, East Grinstead . . . . .	475	0	0

## ESHER.

For Supplying Oak Panelling for Dining-room, Lammas Lane, Esher, for Mr. J. H. Lovegrove. Mr. ARTHUR YOUNG, Architect.

C. HINDLEY & SONS, Oxford Street, London ( <i>accepted</i> ) . . . . .	£65	0	0
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## HARTFIELD.

For Erection of Three Cottages at Hartfield, for Mr. R. S. Killick, Groombridge. Mr. S. W. HAUGHTON, M.S.A., Architect and Surveyor, East Grinstead and Tunbridge Wells.

White & Humphries, Tunbridge Wells . . . . .	£549	0	0
J. Luxford, Forest Row . . . . .	535	13	0
R. C. Farmer, Hartfield . . . . .	498	0	0
G. H. Mighall, West Hoathly . . . . .	478	0	0
Charlwood Bros., East Grinstead . . . . .	474	0	0
W. PLEDGE, East Grinstead ( <i>accepted</i> ) . . . . .	377	0	0

## HENNOCK.

For Painter and Decorator Work, Pitt House, Hennock, for Mr. C. Seale-Hayne, M.P. Mr. S. SEGAR, Architect, Newton Abbot.

J. Way, Dartmouth . . . . .	£139	10	0
C. Stevens, Newton Abbot . . . . .	137	11	0
H. Goodman, Newton Abbot . . . . .	137	0	0
Michelmores & Son, Dartmouth . . . . .	120	0	0
L. Bearne, Newton Abbot . . . . .	116	15	0
F. Barrow, Newton Abbot . . . . .	116	0	0
W. Luscombe, Chudleigh . . . . .	114	0	0
R. W. Pitcher, Devonport . . . . .	87	5	0
A. J. Murrin, Newton Abbot . . . . .	86	10	0
Parker Bros., Newton Abbot . . . . .	80	0	0
H. MILLS, Newton Abbot ( <i>accepted</i> ) . . . . .	75	0	0
Ayres & Foster, Stonehouse . . . . .	71	0	0

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The floors are practically noiseless, the different densities of the concrete, brick and plaster, with the air space above, intercepting the sound vibrations.

The depth of the finished floor is 6 to 9 inches only, and when the saving on this head is taken into account, the cost does not exceed that of the ordinary combustible timber floor of corresponding strength.

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## KESWICK.

For Sewerage of High Hill, near Keswick.

J. HUNTER, Maryport (*accepted*) . . . £109 17 6

## KIRKCLINGTON.

For Building Vicarage House, Kirkclington, Notts. Messrs. NAYLOR &amp; SALE, Architects, Irongate, Derby.

D. RICKETTS (*accepted*).  
Twelve Tenders received.

## LANCASTER.

For Building Workshops, &amp;c., at the County Lunatic Asylum, Lancaster. Mr. EDWARD HOWARD DAWSON, A.R.I.B.A., Architect, 57 Market Street, Lancaster. Quantities by Architect.

*Accepted Tenders.*

W. Harrison, Lancaster, builder	£1,890	0	0
R. S. Wright & Son, Lancaster, carpenter	1,060	0	0
Pickles Bros., Leeds, slater	483	0	0
W. Abbott, Lancaster, plumber, &c.	382	0	0
G. Blezard, Lancaster, painter	47	10	0
R. Hall & Son, Lancaster, plasterer	5	0	0

Total . . . £3,867 10 0

## LANCHESTER.

For Sewer Works, Templeton, Consett, for the Lanchester Rural Sanitary Authority. Mr. J. W. ROUNTHWAITE, Surveyor.

G. Robson, Newcastle-on-Tyne	£145	0	0
MILBURN & GIBSON, Blackhill ( <i>accepted</i> )	85	7	9

## LINGFIELD.

For Alterations and Additions to Ford Cottage, Lingfield, Surrey. Mr. S. W. HAUGHTON, M.S.A., Architect and Surveyor, East Grinstead and Tunbridge Wells.

Charwood Bros., East Grinstead	£487	0	0
J. Luxford, Forest Row	454	11	9
W. PLEDGE, East Grinstead ( <i>accepted</i> )	406	13	0

## LIVERPOOL.

For Reconstruction of Carriageway, Yanwath Street, Toxteth Park. Mr. J. PRICE, Engineer. Quantities by Engineer.

J. McCabe & Co., Liverpool	£222	9	6
T. Catterall & Co., Liverpool	212	2	4
W. F. Chadwick, Liverpool	203	15	0
L. MARR, Toxteth Park ( <i>accepted</i> )	202	11	6
Engineer's estimate	206	0	0

## LEYTONSTONE.

For Distempering and Cleansing Works, Painting and General Repairs at the School at Leytonstone belonging to the Guardians of the Poor of Bethnal Green. Messrs. A. &amp; C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities not supplied.

Finch	£290	0	0
Higgs	260	0	0
Sale	200	0	0
Edmunds	192	0	0
Robertson	162	15	0
Richards	157	19	0
Everett	149	0	0
Sherwood	147	0	0
Lilly	139	0	0
Willmott	138	0	0
Munday	135	0	0
Barrett & Power	135	0	0
Wythe	131	0	0
Good	130	0	0
Stevens Bros.	128	0	0
Derby	123	0	0
Shereen & Co.	120	0	0
Collyer	117	0	0
Edwards	85	0	0
KNIGHT & SON, Tottenham ( <i>accepted</i> )	75	0	0

## LONDON.

For Rebuilding the Duke of York Public-house, Queen Street, Edgware Road. Mr. J. W. BROOKER, Architect, 13 Railway Approach, London Bridge, S.E.

*First List of Tenders.*

Garratt & Son	£2,520	0	0
Battley	2,495	0	0
Wm. Downs	2,468	0	0
W. & F. Croaker	2,419	0	0
J. Beale	2,100	0	0

*Second List of Tenders after Reductions made in the Work.*

Garratt & Son	2,375	0	0
Battley	2,348	0	0
Burman & Son	2,290	0	0
W. & F. Croaker	2,269	0	0
Spencer & Co.	2,240	0	0
J. Beale	2,080	0	0
G. J. KICK ( <i>accepted</i> )	1,995	0	0

## BEST GREEN ROOFING SLATES.



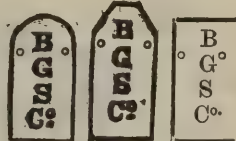
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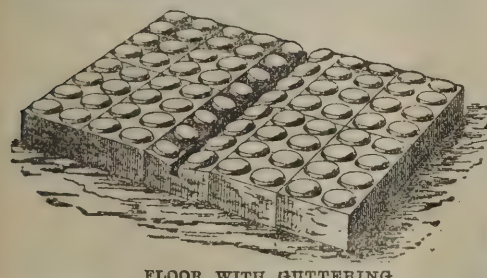
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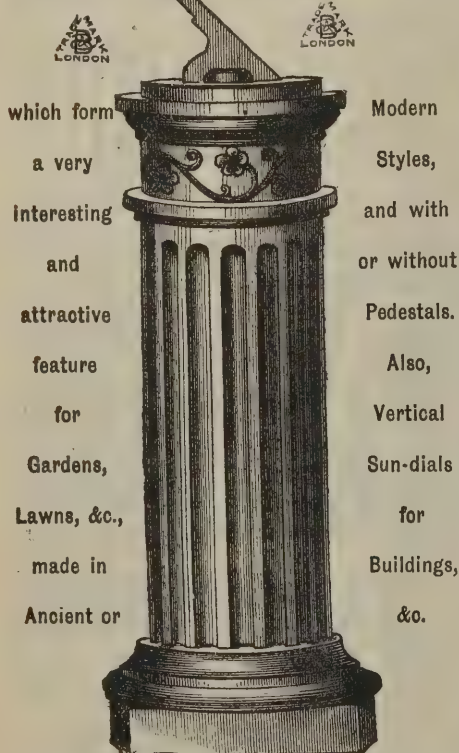
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MESSRS. H. & C. DAVIS & CO., gas-stove makers, of Camberwell, have opened show-rooms at 59 Queen Victoria Street, E.C.

SANCTION has been obtained by the York City Council from the Local Government Board to borrow 2,100*l.* for hospital purposes, with approval of the revised plan and scheme for the erection of a mortuary adjoining the hospital, in lieu of the existing mortuary.

IT is proposed to purchase premises at Doncaster for a Liberal club, and on the space in the rear to erect a large hall for meetings, &c.

THE *Leicester Chronicle*, in a note on the business of the Town Council, says the Highway and Sewerage Committee had nothing of unusual importance to submit to the Council. So far as can be judged from the number of plans submitted to the committee the building trade of the town has been well maintained, and this is taken as indicating continued growth.

THE completion of the Aberdeen Fish Market, in course of construction at the Albert Basin, has been retarded by a serious subsidence in a row of piles on which part of the market was to have been built.

THE tender of Messrs. D. Macandrew & Co., of Aberdeen, contractors for the Peterhead convict prison, has been accepted for building two new official residences at the establishment. The houses, which are to form quarters for the medical officer and the chaplain, will cost 2,800*l.*

THE library and reading-room for the erection and maintenance of which at Girvan the late Mr. J. M'Kechie bequeathed 6,500*l.*, in addition to a free site, will, it is expected, be opened to the public in the course of another month.

A GOVERNMENT inquiry was held last week at Newport, Isle of Wight, the Town Council having asked sanction to borrow money for building a Corn Exchange.

TRIALS of the electric motor on the Birmingham tramways were made on Monday night and Tuesday morning, but owing

to the breaking of the driving-chains on each occasion, no practical results can be recorded. A downfall of snow contributed to the discomfiture of the experimentalists as they dispersed on Tuesday morning.

MESSRS. CAMPBELL, SMITH & CO. have been entrusted with the whole of the decorations of the new Lyric Theatre. The same firm carried out the work at the Empire some time since.

AT the meeting of the Midland Iron and Steel Wages Board, held at Birmingham on Monday, Sir Thomas Martineau presiding, the demand of the operatives for an increase of 12½ per cent. in the rate of wages was discussed. Attention was drawn to the increase of values shown in the Board of Trade returns of iron exported, to the fact of longer time being made in the local works, and to the reported quotations being much higher. In reply, it was pointed out that the market quotations did not represent the prices actually realised, and that there were large current contracts for iron at rates considerably below those which obtained when wages were fixed at their present figure. The President promised to fully consider the representations made, and endeavour to do justice on both sides.

THE chimney-shaft at the engine-house, East Farleigh, the pumping-station of the Maidstone Waterworks Company, has just been repaired. The cap and the upper part of the brick-work having become dangerous, a contract was made with Mr. Palmer, of Rotherhithe, a steeple-jack contractor, to do the repairs without a pole scaffold. Scaling ladders were used to reach the top, where a stage was erected. Messrs. Drake & Muirhead cast the cap, the weight of it being nearly 1½ ton. The height of the chimney-shaft is 126 feet above the river.

ON Friday evening the workmen employed by Messrs. Wallis & Sons, of Maidstone, and Messrs. Gray Bros., of Tunbridge, in the erection of the new bridge at Tunbridge, were given a dinner at the Castle Hotel by the two firms. Mr. G. E. Wallis presided, and Mr. O. Gray occupied the vice-chair, upwards of fifty being present, including Mr. F. Spencer, clerk of the works.

THE Local Board of Featherstone, near Leeds, have received notice of complaint from Lord St. Oswald as to the nuisance arising from their present sewage farm. Mr. M. Paterson, C.E., Bradford, reports as to the best means of remedying the nuisance that the 25 acres of land now leased

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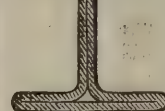


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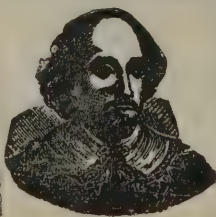
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MESSRS. J. WHITEHEAD & SONS, Aberdeen, have completed a granite pedestal for the statue of the late Mr. Samuel Morley, to be erected in Nottingham. The pedestal is formed of red Peterhead granite, with a base of grey Porsley granite.

A NEW town hall has been erected at Brecon, and special attention has been paid to the ventilation, the latest improved form of Messrs. Robert Boyle & Son's patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

TENDERS are to be obtained for the town hall new works, Northampton.

THE Glack Mansion House, 22 miles from Aberdeen, with 283 acres of land, has been acquired by the authorities of the Aberdeen Royal Infirmary and Lunatic Asylum, for the purposes of an adjunct or branch to the main institution in the town. The structural alterations necessary will be carried out by Messrs. Matthews & Mackenzie, architects, from whose designs Glack House was originally built.

THE salary of Mr. Colson, the manager of the Leicester Gasworks, has been raised from 750*l.* to 900*l.* per annum. It was stated at the meeting of the Town Council that Mr. Colson, in connection with the new works, which involved an expenditure of 150,000*l.* or 160,000*l.*, had saved 6,000*l.* or 7,000*l.* as architect and engineer.

THE Wheatsheaf Hotel, at Northwich, has collapsed, owing to the subsidence of the land from the salt-workings. Some time back subsidences had occurred in the hotel yard, and swallowed up such trifles as a horse and a dozen barrels of beer.

THE acceptance of tenders for building the proposed school for the Feltwell School Board has been postponed to an adjourned meeting.

PLANS have been prepared for the Northern Police Buildings, Glasgow, by the master of works, recommending the removal of all the existing buildings, and the substitution of an

entirely new structure containing thirty-five cells (the present cells number sixteen), with improved court-hall, and extended accommodation for the other adjuncts of the establishment. The probable cost will be 16,000*l.*

THE Darlaston Local Board on Monday decided to obtain tenders for furnishing the new public buildings. The preparation of new building by-laws was deferred till after the opening of the new buildings.

AT the meeting of the Dublin Corporation on Monday a communication was received from the secretary of the Dublin, Wicklow, and Wexford Railway Company, enclosing a copy of Major Marindin's award as to the viaduct to be erected across Beresford Place, with a copy of the revised design for the viaduct prepared in accordance with the award. The award stipulated that the total number of spans between the pier at the north side of Beresford Place and the pier at the north end of the Liffey Bridge adjoining the Custom House Quay shall not exceed five. The whole of the piers carrying these spans shall be of similar construction and design, and the wrought-iron lattice girders between the limits mentioned shall be of uniform depth and of design, ornamental but not too florid. If it be considered necessary for the protection of the public riding or driving through Beresford Place to fix any screen above the level of the girders, such screen shall be also ornamental and in harmony with the remainder of the design.

THE Clyde Navigation Trustees on Tuesday approved of a recommendation that a dock should be provided as speedily as possible at Cessnock to the extent of dock No. 1. The work will cost about 270,000*l.*, and will be three or four years in process of construction.

IT is officially announced that the term for inviting tenders for the contract for works for the improvement of the bar of Rio Grande do Sul has been extended to February 6, 1889.

THE tender of Mr. Humphrey has been accepted for the enlargement of the Union Workhouse at Epsom, from the plans of Mr. H. D. Appleton, F.R.I.B.A.

MESSRS. W. POTTS & SONS, of Guildford Street, Leeds have completed a clock and set of bells for the parish church tower at Paddock, Huddersfield. The clock shows the time on four large external dials 6 feet 6 inches in diameter, and strikes the St. Mary's of Cambridge chimes on the four smaller bells, and the hours on the large or tenor bell, constructed from the designs and plans of Lord Grimthorpe, with all his latest im-

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provements inserted, on the solid cast-iron horizontal bed-frame plan, the top surface of which is planed perfectly flat; all the bearings of gun-metal screwed separately into the frame, so that each or any wheel may be taken out separately if required without disturbing the others; Lord Grimthorpe's double three-legged gravity escapement, and maintaining power on the bolt-and-shutter plan; compensation pendulum, composed of zinc and iron tubes with steel rod through the centre, and cast-iron cylindrical-shaped bob of about 2 cwt.; automatic gas apparatus for turning on and off the gas according to the season of the year. The hammers are fixed in iron frames with steel check springs, bevel wheels in iron stands brass bushed, gun-metal dial wheels cut on the engine, and copper hands balanced or counterpoised within. The dials are of skeleton cast-iron to form the circles, figures, and minutes, filled in with opal glass; also reflectors in metal frames, iron barrels, patent steel wire cords, and B-block pulleys bushed with brass and pivoted in, weights cast in slips for readier adjustment, index dial inside for the purpose of setting the hands outside, and everything necessary and requisite in a first-class clock, all made and fixed by Messrs. Potts & Sons, who got the work in public competition against some of the leading firms. The cost of the clock is defrayed by public subscription, and by all the various denominations. The fine set of five bells were presented to the church by Mr. Joseph Crosland, J.P., of Royd's Wood, Lindley, who also paid for the fixing. The tower being unsuitable for illuminated dials, Messrs. J. Kirk & Sons, architects, Huddersfield and Dewsbury, prepared the necessary plans, also put new floors in, the old ones being found decayed and not safe. Messrs. Potts have received instructions to make and fix for the county magistrates a new clock at Prestwich Asylum, Manchester; new clock at Dewsbury town hall for Alderman Mark Oldroyd, J.P. (the Mayor); and new clock at Burnley new town hall, for the Mayor and Corporation.

#### EMPLOYERS' LIABILITY.

A BRICKLAYER, William Brown, of Miles Platting, brought an action for the recovery of 100*l.* from John Burtenshaw, of Clayton, contractor, as compensation for injuries sustained in his employ at Dunkerley's Chemical Works, Bradford, on October 28, 1887. The case was that on the date mentioned he was working on the building of a wall when the scaffolding

on which he stood gave way. He sustained injuries from which he had not yet fully recovered. It was alleged that the defendant was himself present when the scaffolding was put up, and had his attention called to its defective condition. Mr. Titmas, architect, deposed that the scaffolding was not strong enough to bear the weights that, according to plaintiff's evidence, were put upon it. The defence was that the plaintiff contributed to his own misfortune. The Judge gave a verdict for the plaintiff—damages 21*l.* and costs.

#### REGISTRATION OF PLUMBERS.

At a meeting at Guildhall on Saturday, Mr. Wm. Henry Bishop, Royal Exchange Buildings, was sworn into the office of Master of the Plumbers' Company; Mr. C. Hudson, R.P.C., Greenwich, to that of Upper Warden; and Mr. W. Digby Seymour, Q.C., Temple, to that of Renter Warden, for the ensuing year. At the same meeting, the honorary freedom of the Company was conferred upon Messrs. W. H. Perry, W. H. Allen, J. Radcliffe, and W. Sevenoaks, four practical plumbers, who succeeded in passing in honours the City and Guilds of London Institute technological examination for plumbers, and who are now engaged as certificated teachers of plumbers' classes in the technical schools at Bristol, Cardiff, Manchester, and Windsor respectively.

At a public meeting held in the town hall, South Shields, the Mayor (Alderman Scott), presiding, Mr. Armour, of Gateshead, explained the position and objects of the Plumbers' Guild. Alderman Wardle, chairman of the Sanitary Committee of the South Shields Corporation, said everything would be done by himself and the members of the Corporation to render the guild successful. Dr. Munro, medical officer of health, pointed out that the benefits to the public arising from the registration of plumbers were quite as distinct and clear as they were to the plumbers themselves. In conclusion, he moved that Alderman Wardle, chairman of the South Shields Sanitary Committee, Councillor Robert Readhead, and Mr. J. H. Morton, architect, should represent the general public of South Shields on the District Council in Newcastle. The motion was carried. Messrs. J. L. Hall, John Dagleas, and J. Marshall were appointed to represent the masters, and Messrs. J. C. Burns, T. Cranston, and Thomas Lambell to represent the operatives on the Council.

A public meeting with a similar object was held in Council

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### IMPORTANT COMMUNICATION. — WHITELEY'S FIRE.

WILLIAM WHITELEY, Westbourne Grove, London: October 12, 1887.

HOBBS, HART & Co., Limited.

GENTLEMEN,—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting powers of your Strong-room Doors and the Safes.

The recent fire at my establishment, in my opinion, subjected them to the greatest possible test, and through all they proved invulnerable. The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.

You will be pleased to hear that it has been decided to adopt your Patent Clutch Rebated Doors for all the party walls in the new buildings now in course of erection.—I am, Gentlemen, faithfully yours,

(Signed) WILLIAM WHITELEY.



Chambers, West Hartlepool, the Mayor presiding, supported by the Mayor of Hartlepool, Professor Gurnett, Durham Science College, Dr. Gourley, medical officer of health, Mr. J. W. Brown, borough surveyor, and Councillor Pyman. There was a large attendance of plumbers, including many apprentices. Councillor Gurry and Mr. Brown, borough surveyor, were appointed to represent the public interests. Four masters and four operative plumbers were elected as trade representatives.

A meeting was held last week at Middlesbrough, Mr. T. Sanderson, the mayor, presiding, for the purpose of instituting, in connection with the recent movement in favour of the registration of plumbers, a class for the technical instruction of members of the trade. Amongst those who were present were Mr. John F. Wilson, Mr. E. L. Kirby, Councillor Hind (Stockton), Mr. John Giers, and Mr. D. D. Wilson. Mr. J. Livingstone, Mr. George Lambert, Mr. Bullough, and Mr. D. Walton represented the Middlesbrough plumbers, and there were also representatives from Redcar and Saltburn, which will, together with Stockton and North Ormesby, be entitled to the benefits of the proposed instruction. It was stated that the trustees of the High School had offered to place at the disposal of the trade rooms in which to hold classes of instruction, which will probably be provided from the Technical College at Newcastle. It was stated that Stockton, in the event of a class being formed, would send at least sixteen pupils, and it was decided to leave the matter in the hands of the master plumbers, who will shortly communicate with Mr. E. L. Kirby, the secretary *pro tem*.

#### PROGRESS OF MANCHESTER.

ON occasion of a complimentary dinner given to Alderman Abel Heywood last week in Manchester, Mr. Heywood, in replying to an address, referred to improvements that had been made in the town. "You refer in your address to my committee work. Just in a sentence or two let me say that from first to last my efforts have been directed to making as far as I could the lives of the very poor worth living. I early saw the fearful insanitary conditions under which the poor of Manchester existed. Our committees have done much to make things better. True it is that a great deal has yet to be done, but in measuring what has been accomplished let the condition of things be remembered under which we came into existence, and bear in mind the almost unparalleled rate at which our population, and especially our working-class population, has

grown. With regard to the Improvement Committee, it certainly has done much good work. Manchester, if not an architectural wonder, is far different from what it once was. Deansgate is one great monument of our work. A broad spacious thoroughfare with palatial buildings, and no longer the congeries of courts and alleys in which the criminal population of the town found a secure refuge. Market Street, Piccadilly, Portland Street, Oxford Street, London Road, Albert Square, Hunt's Bank, and as many other of our principal thoroughfares all tell the tale of improvement. Victoria Street, too, as I need hardly remind you, is not the street it was. Passing on, I may recall the fact that in 1855 I became an alderman of Manchester, and that ten years later I was for the first time Mayor. We were then beginning to feel the inconveniences of the King Street Town Hall, and it was on my motion that a Town Hall sub-committee was appointed to consider the advisableness of building a new home for the Council and the corporate workers; of that committee I was chairman. We determined, and the Council approved our determination, to build a new Town Hall in Albert Square. On this matter I need dwell but briefly. Most of you are well acquainted with what was done. We cleared a vast area of its buildings, and Mr. Waterhouse's beautiful design rose stone on stone and pillar on pillar until this wonderful structure was at last completed. We spared no expense, yet we were not extravagant. Every detail we desired to have perfect. To have been parsimonious, to have neglected corners or recesses which were obscure, to have allowed ornamentation which was tawdry would have been for ever to brand Manchester as a city given up to no higher thought than the quickest accumulation of wealth. By universal admission the Town Hall is a worthy monument of the industrial greatness of Manchester, and an outward and visible sign to the world that our thoughts are not wholly given up to mammon, but that the higher culture is not neglected among us. Time may have darkened the outside purity of those walls, but the graceful, tapering towers and noble archways are still full of beauty as when the sound of the last hammer and chisel ceased; while the long cathedral aisles of the interior, this magnificent banqueting hall, the splendid central hall with the mural paintings on which Mr. Madox Brown has bestowed so much artistic care—these are the admiration of every stranger who visits our city. Day by day I saw this glorious building rise until every pinnacle was complete, and when at last came the opening day I found myself for the second time, by your favour and the favour of the citizens, Mayor of the city of Manchester. The Queen did

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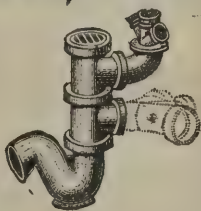
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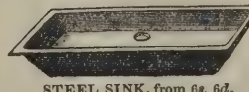
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not favour us with her presence, as we hoped; but all who remember the magnificent ceremonies attending the occasion will probably be of opinion that, even with the presence of royalty, the demonstrations could not have been more complete and effective."

#### PRACTICAL EDUCATION.

ON Saturday Mr. H. S. Hele Shaw, C.E., of the Liverpool University College, distributed the prizes, and certificates to the students of the Liverpool Science and Art Classes in connection with South Kensington. In the course of his address he said:—The undoubted pleasure which the pursuit of knowledge insured, and the keen sense of the value of such knowledge for its own sake no doubt stimulated many, if not all, to persevere, but at the same time the majority required some substantial assurance of a practical return. From his own experience he knew how many inducements there were to relax attendance at evening classes, and sometimes give them up altogether, and bearing that in mind he readily accepted the invitation to say a few words to the students on that subject. In the history of successful men they were often struck by the apparently slender stock of knowledge which they possessed; many of the greatest engineers and inventors, not only of the past century, but even down to the present day, having been comparatively unlettered men. Careful study, however, would show that such men had succeeded in spite of, and not because of, this want of knowledge. It would be found that they all possessed force of character, which was not to be daunted by obstacles or scared by difficulties. They had been pioneers in some particular direction, and had struck out an original course for themselves. The history of successful men proved that not only must they have the power, but that it must be rightly directed, and still more did the history of unsuccessful men and inventors point to the same moral. It was true that many men of world-wide fame had but scant knowledge of book information on the principles of their life work, but it must be remembered that they were pioneers in new fields, and furthermore there was abundant evidence that these men learned what they could. The uneducated self-made man of to-day was rarely to be found who did not envy the advantages which the students of these science classes possessed, and the history of the past went emphatically to contradict the foolish notion which he was sorry to say sometimes found its way into the public press and scientific journals, that

because such men did not possess knowledge, therefore they despised it. They, however, had to do with to-day, and not with the past. It was hard to realise, without considerable effort, the lessons of the times in which we lived. Progress went on now as ever; the same originality was necessary, and the same qualities of mind as of old. Few succeeded where many failed, and out of 17,000 patents applied for each year only a small percentage survived the first stages. How many more would survive if inventors studied the charts and maps of their predecessors! It was certain that the inventor who despised the teachings of science, and went to work to rediscover for himself what he might learn from records left by others, had each year a smaller chance of success and a growing probability of spending his life in merely repeating the work of others who had gone before.

He then referred to Bartholdi's statue of *Liberty*; to the Severn Tunnel, and the way in which the difficulties of "setting" and flooding were overcome; and to the construction of the bridge over the Firth of Forth, which was exciting the wonder of all engineers. The train would be carried at a height of 150 feet above the level of the Forth, whilst the piers rose more than twice that height above the water. Nearly 50,000 tons of steel would be employed in the construction of the bridge, and would enable the two largest spans in the world to be formed. Those three examples showed that there was apparently no finality in mechanical science, and that the problems which presented themselves were equally new and required the same faculties for their solution as were required by the early engineers.

The same process of thought required to evolve great works was required day by day in every workshop and manufactory in the country, because if one man did not keep moving and produce new and improved designs he would soon be left behind by his rival. Perhaps one of the most significant features of the last Patent Act was the power which was given to the inventor to improve upon any patent, to compel the patentee to either take up the improvement or license the improver to use the original patent, so that the way of progress could not be blocked by the patent, however good and new, if something better and newer could be devised. He cited changes that were now taking place in actual workshop practice to prove that the methods and practice of the mechanical arts as yet were changing and progressing perhaps more swiftly than ever. All this progress was in one direction, which they might call the production of the copying principle in machines. It was

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#### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIRS.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 32 Cavendish Street, Streteford Road, All Saints, Manchester: November 22, 1887.

DEAR SIRS.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly, S. C. LOWE & SON.

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not a case now of one section in this country against another, skilled workmen against those who invented machines to do their work, but of this country struggling for trade against the world. They wished to train every faculty of the young, and leave no stone unturned to equip them for the keen competition of life. He had purposely avoided the use of the word technical, because people were getting tired and weary at hearing it trotted out with vague and unmeaning phrases and generalities. What they wanted was practical guidance as to how to meet the wants of to-day, and such instruction those classes of the science and art schools afforded. One of their objects that night was to encourage students to persevere, and he pointed out that it was only by patient repetition that skill was obtained in science and art, and it was the same thing in mathematics, and even classics. The same thing held all through life, and he firmly believed that why what were called premium apprentices or pupils were so often a drug in the market was on account of the very fact which was deemed by them to be of so great an advantage—passing in succession from one branch of work to another, instead of being kept steadily to one thing until they had thoroughly mastered it. There were, as it were, two dangers which threatened the barque of the young apprentices. On the one hand there was the Scylla of mere routine, and on the other hand there was the Charybdis of superficial knowledge and smattering attainments which meant still more certain ruin. There was, however, plenty of sea room between, and he felt sure that the students at any rate of the Liverpool science and art classes would be sufficiently good navigators to steer clear of either.

#### THE LAMBETH REREDOS.

LAST week we mentioned the dedication of the new reredos, presented to the parish church of St. Mary, Lambeth, by Sir Henry Doulton.

The reredos has been executed at the works of Messrs. Doulton, Lambeth, from the designs of Mr. J. Oldrid Scott. With the exception of four columns which are in salt glazed Doulton-ware, the whole of the reredos is in a fine terra-cotta of warm buff tint. It consists of a central portion 8 feet 6 inches wide, containing three arched bays; the centre opening is filled with a representation of the Crucifixion, and the arches on either side are subdivided, and each contains two sculptured figures. Slightly recessed from the central portion there are

wings 3 feet wide on either hand, making the total width of the reredos about 14 feet 6 inches. Up to a height of 5 feet the design is quite plain; the portion next above contains the sculptured panels set within arches, the traceried heads of which are richly elaborated. The central portion is terminated with a projecting cornice with ribbed cove below, and open cresting and pinnacles above; the highest pinnacles will support statuettes of angels. The height to the top of the cresting is 11 feet 9 inches, and to the top of the statuettes about 15 feet. The weight of the whole reredos is carried clear of the floor by means of a concealed girder.

The sculptures have been designed and modelled by Mr. George Tinworth. The central panel (4 feet 9 inches high, 2 feet 9 inches wide) contains a representation of the Crucifixion; the dying Saviour is shown hanging upon the cross, and regarding earnestly the little group of faithful ones standing near. Bending low at the foot of the cross is the weeping figure of Mary Magdalene, and behind her stands the Virgin Mary supported by St. John, both of whom are gazing at Jesus. On the opposite side of the cross are two soldiers tearing the garment of the Lord; behind them are two priests, and in the background other soldiers and a centurion on horseback. Above the Saviour's head is fastened the tablet bearing the inscription in Hebrew, Greek, and Latin.

In the four smaller panels (each about 2 feet 8 inches high and 11 inches wide) are single figures. Beginning at the left hand (the north side), they are as follows:—1. A figure of the Patriarch Moses bearing the table of the Law (Exodus ii.). In the background are represented a prickly pear and a broken Egyptian capital as a symbol of the broken power of Egypt. Etched in behind the figure is the reference, Numbers xi. 29. 2. A figure of the Apostle Peter carrying a lamb in his right hand (as an attribute of St. Peter; this is an original symbol of Mr. Tinworth's, see John xxi. 15), and a book and keys in his left. At his feet is a cock, and behind him are shown a boat and some nets. The reference here etched is 2 Peter i. 3. A figure of the Apostle Paul in prison, with fetters upon his wrists, and a scroll in his hand. Etched on the background are the words, "I have fought a good fight, I have kept the faith," and the reference, 2 Cor. xi. 22. 4. A figure of the Prophet Elijah, staff in hand, and attended by two ravens. In an opening in the tracery above the figures of Moses and Peter is represented a nest with birds feeding their young, and in the corresponding position on the other side, a similar group of birds about to fly from the nest.

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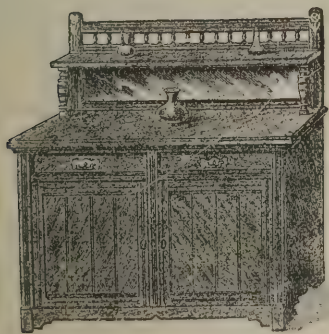
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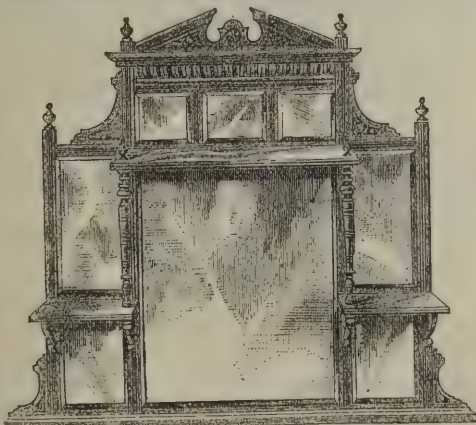
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In Solid Oak or Walnut, with drawers and cupboards, enclosing cellaret, bevelled plate in back. 3 ft. wide, £3 3s.; 3 ft. 6 in. wide, £4 4s.; 4 ft. wide, £5 5s.

Sideboards, from 35s. to 40 Guineas.



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Inserted in quatrefoil panels in the wings of the reredos are four portrait medallions of archbishops. Beginning on the left hand, they are arranged as follows:—Hubert Walter or Fitzwalter, archbishop from 1193 to 1207, Lord High Chancellor in the reign of Richard I. 2. Richard Bancroft, archbishop from 1604 to 1610. 3. Thomas Tenison, 1695 to 1716, translated from Lincoln. 4. Thomas Secker, archbishop from 1758 to 1768, buried in the churchyard of Lambeth.

The medallions of Bancroft, Tenison, and Secker have been modelled from photographs taken from the original portraits in Lambeth Palace; that of Tenison was painted by Simon Dubois, and that of Secker by Sir Joshua Reynolds.

#### REFUSE DESTRUCTORS.

AT the quarterly meeting of the Yorkshire Association of Sanitary Inspectors, held in Bradford on Saturday, Mr. Wm. Warner, C.E., of Nottingham, read a lecture on "Destructors and Refuse Furnaces." He remarked that the development of the burning method of destroying town refuse had been no easy matter, and at the present time it had to fight many battles; but a study of the points raised would show that all the objections to the system were without foundation. Yorkshire was one of the first places to enter the field. Leeds had its first destructor built in the year 1877, and it appeared to have sufficiently satisfied the Corporation that a second was built in 1879. In 1881 the system was taken up with spirit, for Blackburn, Bolton, Bury, and Bradford erected furnaces of this kind, and in the following year Derby, Ealing, Hull, Nottingham, and Salford came to the front. It must not be assumed that those towns which had destructors at work had not been troubled after once their collected refuse became treated by fire, for agitation had been repeatedly set on foot to close such works. The evidence of the highest medical authorities, however, was that it could not be possible to obtain a verdict against the use of furnaces for burning refuse if constructed upon the best principles. They had the evidence of medical men that, where destructors had been started, the death-rate had been reduced. This might not be caused by the furnaces themselves, although it must be attributed to them, as there was not the slightest doubt that where they were erected the authorities, through the able diligence of the sanitary inspectors, looked up every hole and corner in the districts where they were situated, and by that cause a better bill of

health was the result. There was another important feature as assistant to health in the fiery process. The destructor, as erected at Hammerton Street, Bradford, as shown by Mr. Codrington, required some 13 tons of air, taken from the atmosphere, to each ton of refuse consumed. Calculating upon the 72 tons, which was about the quantity burnt in twenty-four hours, there was something near 1,000 tons of air taken up during that time, and as 13 cubic feet of air at 60° Fahr., and under a pressure of 30 inches of mercury, weighed about 1 lb., nearly 30,000,000 cubic feet of air was required for the effective burning in the destructor every twenty-four hours. This enormous quantity of air burnt must be replaced at one continuous rate, and they might therefore imagine the chimney to be a huge ventilator, which not only drew the impure air into the furnaces, where its injurious properties were destroyed, but actually caused a current of fresh pure air into the neighbourhood equal to the great amount already mentioned. Consequently those who lived near destructor depôts had the advantage of the immense volume of air necessary to replace that which was taken into the furnaces, and thus purified the atmosphere, were better looked after by the authorities, and kept more free from ordinary nuisances. Taking the ordinary refuse at Leeds and Bradford, and an average of the residue after destruction, there was only 28 per cent. of combustible matter to do all the work; in other words, this small percentage of combustible had to raise the temperature of the furnace sufficiently high to fuse a bulk of mineral matter 20 per cent. greater than itself, and evaporate 47 per cent. of water, which was more than 70 per cent. over that amount, and all this must be done in the presence of each other. After describing the several appliances introduced for burning refuse, he passed under notice Jones's "Fume Cremator." Dr. Tidy had said, "I cannot help thinking myself that in Jones's destructor, where he places a muffle furnace or 'fume destroyer,' as he calls it, between the furnace and the main shaft, he has in a great measure met those two difficulties by a certain escape of offensive vapour, mainly due to partial burning and the escape of fine sand from the shaft at certain stages of the operation." From experiments conducted with the heat passed from refuse furnaces, the best boiler to generate steam was found to be of the multitubular type. By such construction a great heating surface was obtained, and a more effective use of the gases was secured. The pyrometer as adopted at Leeds would be found of valuable assistance to detect and maintain the heat and steam at a regular pressure, and thus cause the workmen to

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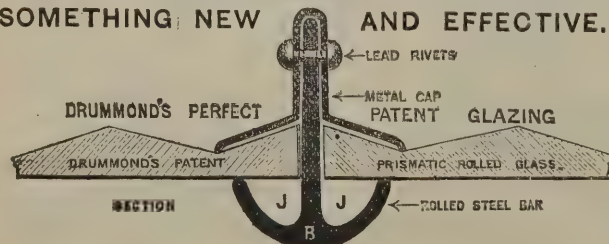


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recognise these important features. As to the utilisation of the products of the destructor, he spoke confidently of the possibility of its being so carried out as not only to pay for the cost of burning and the repayment of capital expended on plant, but to produce a revenue to aid the necessary cost of collection.

Mr. Cox, borough surveyor of Bradford, said that he had found that the adoption of rocking-bars secured a more complete combustion. As a result of careful trials, it had been found the destructor yielded clinker and ashes to the extent of one-fourth in bulk, and one-third in weight, of the refuse before treatment. The making of mortar reduced the cost of working the destructors, and at Bradford in one year as much as 1,200*l.* had been received.

### THE NINE ELMS CARRIAGE WORKS.

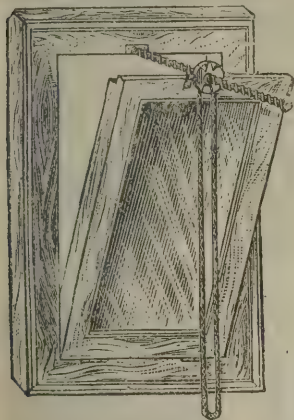
THE Society of Engineers recently paid a visit to the London and South-Western Railway Locomotive, Carriage and Waggon Works, at Nine Elms, and were conducted over the works.

These works, which were originally designed by the late Mr. Joseph Beattie, and at that time considered very complete, have been, owing to the increase of traffic and stock, considerably altered and enlarged by Mr. William Adams, the present superintendent. The works, which cover 45 acres of ground, are situated at Nine Elms, which is on the south-east side of the main line after leaving Vauxhall station, and between 2,000 and 2,500 men are employed.

The locomotive department consists of machine, erecting, wheel, smiths', fitters', cylinder, brass, copper-smiths', boiler, tender-fitters', mounting and pattern shops, grindery, iron and brass foundries, and running sheds. The "short" machine shop is a large brick building, well lighted, and is 164 feet long by 57 feet wide. It is well fitted with the most modern classes of machine tools, milling machines being conspicuous by their large numbers, notably an horizontal milling machine by Messrs. Muir, of Manchester. A very massive profile milling machine is also used for machining such articles as "expansion-links," "jaw and T-ends of eccentric rods and connecting rods." These machines leave the work in such a state of perfection that further attempt at finishing with a file would only spoil it. There is also a very massive-frame plate slotting and drilling machine combined, capable of slotting 12 steel plates, 1 inch thick, at one

time. The drilling is done by three of Messrs. Craven Bros.' radial drilling machines, having a radius of 10 feet 6 inches, which overhang the table of the slotting machine. This arrangement considerably diminishes the amount of time and labour, as plates can be slotted and drilled at one setting. We also find here numerous slotting, planing, and boring machines, also a duplex coupling-rod planing machine having two cross-slides, and arranged to cut when the machine is running in either direction. Also a circular saw for cutting cold iron, which is found to save much time and labour in cutting out such work as the jaw-ends of rods, &c. The steel line shafting for driving the innumerable machines is supported on cast-iron columns, and runs the entire length of the shop. Leaving the "short" machine shop, we enter the cylinder shop, which is provided with a very useful overhead travelling crane, made at Nine Elms. Here will be noticed two very fine vertical milling and drilling machines, which are used for machining the valve faces of cylinders; also a radial drilling and tapping machine, in connection with which is used "Pearn's" patent tapping apparatus, by the use of which cylinders can be drilled, tapped, and studded with one setting. The cylinder boring machine is adapted for boring two cylinders at one time. The cylinders for the new tank engines, which are being built at Nine Elms for suburban traffic, being cast together, both bores and valve-spindle stuffing boxes are machined at one time. This shop is 57 feet long by 29 feet wide. Entering the fitting shop, which is 118 feet long by 58 feet wide, and arranged upon the most approved plan, we notice several "vortex blast pipes," the invention of Mr. W. Adams. There is no doubt that when this pipe is designed on thoroughly scientific principles that a great saving of fuel is effected, and this has been proved by the gradual decrease of coal consumption during the last three years on the South-Western Railway. We may here mention that the average consumption of fuel in 1885 was 30 lbs. per engine mile, which has now been reduced to 26½ lbs. per mile. This has effected a total saving, since June 1885, of nearly 34,000*l.* There are now nearly 300 engines on the South-Western Railway alone fitted with this pipe, and it is giving very great satisfaction. Coupling-rod bushes are now made solid without adjustment, and are forced into the rods by means of a small hydraulic press recently made at Nine Elms. Passing into the brass shop, which is 59 feet long by 45 feet wide, we find it provided with the most modern appliances for brass finishing, amongst which may be mentioned four "Cooper's patent lathes," which are too well

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known to need further description. In this shop is made the white metal piston and valve rod packing, which is a standard now with all new engines of the South-Western Railway, and is giving the greatest satisfaction. There is a pressure-gauge testing machine, and also one of Edward's patent emery-band grinding machines, which has proved a most valuable machine for finishing all kinds of brass fittings of irregular shape. We then enter the millwrights' shop, which is 85 feet long by 58 feet wide, and which is fitted with very modern machinery, including two universal milling machines, cutter grinding, slotting, planing, and shaping machines. In this shop are made the twist drills, taps, reamers, and small machines which are used throughout the shops at Nine Elms. In the course of construction is a double-cylinder horizontal steam-engine for the saw-mill. It is intended to run at 140 revolutions per minute, and will drive on to the line-shaft by means of ten ropes, and will be capable of transmitting 350 indicated horse-power. We pass through the coppersmiths' shop, which is fitted with the usual brazing furnaces, &c., which do not call for any special comment, and proceed to the "long" machine shop, which is 300 feet long by 57 feet wide—the standard width of the shops at Nine Elms. The steel line shafting here is carried on cast-iron columns, and runs the entire length of the shop. The vertical engine for driving this is coupled direct in the centre of the shop, and runs at 100 revolutions per minute. All machines of one class are placed together. Screwing machines are the first to attract our attention, the most modern of which are Barrow's patent, capable of screwing, with excellent finish, some 800 copper stays in the course of a day. Further on are larger machines of the same class capable of dealing with square-threaded screws of carriage couplings, &c. In the same shop are numerous small lathes, shaping machines of all sizes, a very heavy brake lathe, and a very massive crank axle lathe by Messrs. Craven Bros., of Manchester, having four rests, all of which may be used at one time. A piston-rod grinding machine is here in use. The rods are first roughed down in the lathe and finished off here. Mr. Adams was the first to use this form of labour-saving tool, and we had an opportunity of judging the work turned out by this machine, and it left nothing to be desired. Nearly all the drilling machines at Nine Elms are fitted with balanced spindles, and this is found to save the breaking of many drills. Entering the wheel shop, which is 195 feet long by 57 feet wide, we find five 7-feet, two 6-feet, and one 4-feet lathes. These are served by two 4-tons "walking" cranes, to which motion is

communicated by an endless cotton rope. We notice in this shop, being turned, a large rope fly-wheel for the stationary engine for the saw-mill. This wheel in the casting weighs 8 tons. In this shop are also the usual quartering, axle-grooving, and wheel-studding machines. There is also a tyre furnace and shrinking well, which are served by a separate fixed crane driven by an endless rope.

The erecting shops consist of two bays, each 500 feet long by 57 feet wide and have accommodation for seventy engines. There are three roads in each bay. Each erecting shop is provided with two 25 tons overhead travelling cranes which are capable of lifting an engine bodily from one road to another. The cranes are driven by an endless cotton rope, and each is capable of lifting and travelling transversely and longitudinally at one time, all of which operations are controlled by one man. There is in all 2,000 feet of line shafting, which runs in cast-iron self-acting pedestals, and is provided with Mather & Platt's friction clutch, so as to enable any one length to be disconnected at will. This shafting is found to be of great use in working the "Stowe" flexible drills, cylinder boring and valve facing machines, &c. Hydraulic piping, supplied with water at a pressure of 1,500 lbs. per square inch, is laid throughout the entire length of these two shops, so that small hydraulic tools can be worked from this source of power. In these shops will be noticed several of Mr. Adams's bogies, steel being freely used in their construction. The far end of one of these shops is used as a paint shop, and from thence we pass across the steam traverser, which has recently been lengthened, and is capable of carrying an engine 30 feet wheel base, into the tender shop, which is 90 feet long by 51 feet wide, and which is fitted with a Tweddell's small hydraulic rivetter, and a 25 tons overhead travelling crane driven by an endless rope. We now enter the boiler shop, which is 178 feet long by 116 feet wide, and which is fitted up with the most approved appliances as used in the manufacture of locomotive boilers. This shop is divided into two bays, the first of which contains the machine tools, and is fitted with a 15 tons overhead travelling crane by Messrs. Craven Bros. of Manchester. Here are also numerous radial and multiple drilling machines, and a fine 12 feet plate edge planing machine and two tube plate drilling machines. There has also been recently fixed a pair of horizontal plate-bending rolls by Craig & Donald, which are capable of bending steel plates 8 feet wide by  $\frac{3}{4}$  inch thick. All the rolls are of solid steel, and the top roll is capable of adjustment by power from

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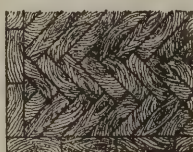
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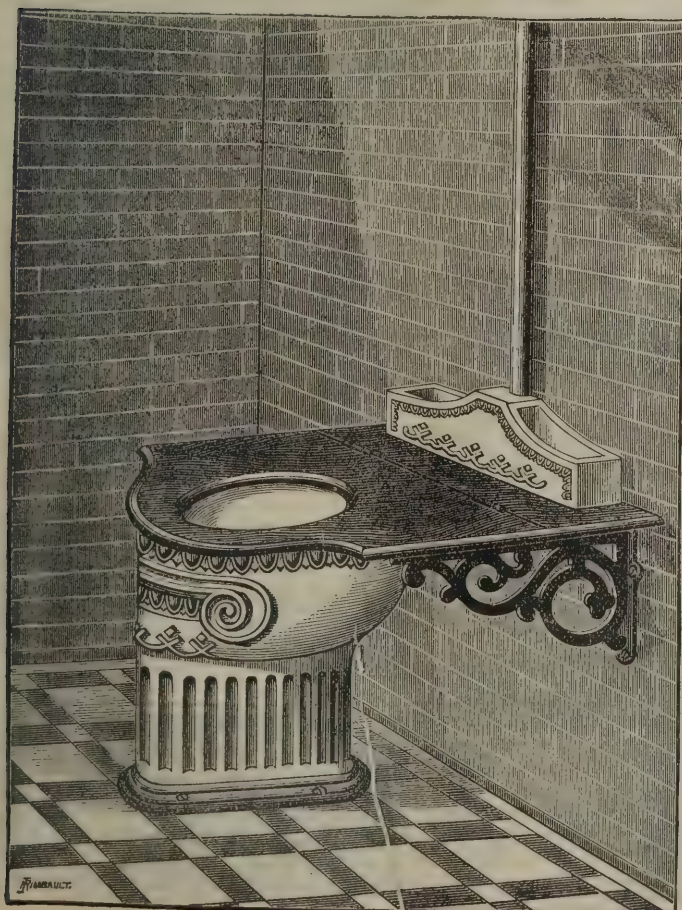
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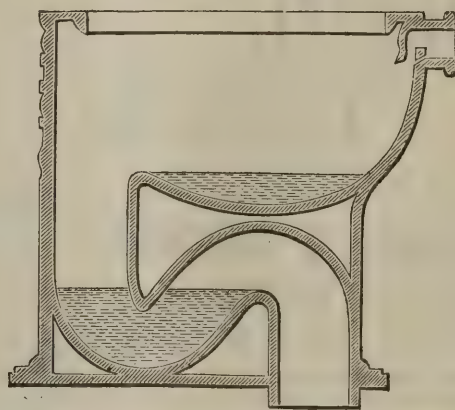
the main driving pulleys. There is also in this part of the shop a plate-grinding machine which has been recently made at Nine Elms, and is found to be thoroughly efficient. A very large number of boilers are in progress of manufacture. Steel, with the exception of the fire-box and tubes, is wholly used in their manufacture. Manganese steel stays are now replacing copper for the firebox. In the adjoining bay is fixed one of Tweddell's stationary hydraulic rivetters, having 11 feet 6 inches gap. In connection with this is a 7 tons hydraulic crane. Along the adjoining wall are fixed six smiths' fires. Close by are two large heating furnaces, and one of Tweddell's flanging-presses, which are served by one crane. At the mouth of one of the furnaces is a very massive levelling-table, upon which the steel frames for engines are levelled after being punched roughly to shape. In the same part of the shop is fixed a large punching and shearing-machine by F. Berry & Co., which is capable of punching  $1\frac{1}{2}$ -inch holes in  $1\frac{1}{2}$ -inch plates, 3 feet from the edge. Leaving here we pass into the boiler-mounting shop, which is fitted with several tapping and staying-machines made at Nine Elms. Continuing our journey we arrive at the hydraulic engine-house, in which is fixed two pairs of engines by the Hydraulic Engineering Company of Chester. These supply water at a pressure of 1,500 lbs. per square inch to an adjoining accumulator, from which all the hydraulic tools in these shops, including three turntables, are worked. In a part of the same building is a battery of stationary boilers of the locomotive type. These supply steam to the whole of the stationary engines at Nine Elms Works. It was found on examination that the water used for these boilers deposited a scale on the plates, and Maignen's process of softening and filtering water has been adopted with very satisfactory results. We then make our way into the smiths' shop, which is 194 feet long by 57 feet wide, and contains twenty-six forges, inclusive of bolt-makers' fires. There are in this shop five steam-hammers, also olivers, three circular saws for cutting hot iron, Ryder's forging machine, Horsfall's patent bolt-making machine, and various other tools and appliances. Blast is supplied to the forges by a Baker's blower. Recrossing the traverser road, we enter the forge and spring-maker's shop, which is a large brick building, 176 feet long by 51 feet wide. Along either side of the building are arranged the forge furnaces, over which are placed locomotive boilers, and fed by the waste gases from the furnaces. These boilers supply steam for working the hammers, &c. Between the furnaces are arranged the steam-hammers,

which consist of two of Rigby's 35 cwt., one 7 cwt., and one 20 cwt. These hammers are served by hand-power cranes, which were made at Nine Elms. In the spring-makers' shop are the usual spring-plate furnaces; also two spring-making machines, one with three motions for spear-pointing, nibbing, and slotting. Close by is a steam spring-testing machine, which was made at Nine Elms. Leaving this shop, we come to the three cupolas with drop bottoms, the largest of which is capable of melting 8 tons of iron per hour. In connection with these there is a steam-hoist for taking the materials up to the charging level. We now enter the iron foundry, which is served by two 5-ton steam cranes, by Appleby Bros. There are also two core-drying stoves, and the usual sand-sifting and mixing appliances; and we may here mention that machine-moulding is largely used at Nine Elms. Adjoining this is the brass foundry, which is fitted with Fletcher's furnaces and the usual appliances. We again cross the traverser road, and enter the carriage-building shop, which is a well-lighted building 194 feet long by 60 feet wide, in which the bodies and under-frames of coaches are built. This shop is heated by exhaust steam. We now pass into the first bay of the saw-mill, in which is fixed a very fine log-frame saw, also a 4-feet band-saw. The far end of this building is utilised as a pattern-makers' shop, in which is fixed a dimension sawing-machine, a band-saw, and a hand-feed planing-machine. Entering the second bay of the saw-mill, which is 194 feet long by 78 feet wide, we find a panel-planing machine by Messrs. Ransome & Co., and a power-feed sand-papery machine by Messrs. Fay & Co., which is used for the mahogany panels of carriages. The cylinder over which the sand-paper is placed has a flexible covering. Adjoining this is a four-sided planing and moulding machine, also a panel-scraping machine, the action of which resembles that of an ordinary hand plane. At the end of the shop is a double-band sawing machine by George Richards & Co., of Manchester, which is especially constructed for cutting out the wood segments of Mansell's wheels. Continuing our journey further, we come to a portion of the shop which is allotted to the sharpening and setting of saws, &c. Here is to be found one of Messrs. Richards' knife-grinding machines, an automatic band saw-sharpening and setting machine, and two circular saw gumming machines. Leaving here, we notice a hand-feed planing and boring machine. Adjoining this is a cross-graining and tenoning machine by Messrs. George Richards & Co., which is used for cutting out the tenons in waggon under-frames, &c. The next to attract

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our attention is a Richards' patent morticing machine, fitted with a chisel for withdrawing the chips. Here are also circular and band saws, a double-spindle moulding machine, a routing machine by George Richards & Co., and adjoining this a six-spindle boring machine by the same makers. At the other end of the shop is a 4-foot circular saw, fitted with self-acting rope gear. Opposite this is a deal frame saw. In this part of the shop is also a planing and trying-up machine, a three-spindle boring machine, a heavy morticing machine, and a cross-cut saw. We must not forget to mention an American rack saw-bench by the Lane Manufacturing Company, and which is capable of carrying a 66-inch saw which runs at 500 revolutions per minute. It has levers set and a very fast return feed. All the sawdust, &c., is automatically conveyed by a fan to a collecting tower, from whence it is utilised to raise steam in one of the stationary boilers. The whole of the shafting for driving the various machines is fixed below the floor, which arrangement keeps all the driving bands out of the way, and does not necessitate the use of countershafts.

Leaving the saw-mills we proceed to the carriage machine shop, which is 194 feet long and 57 feet wide. We here find numerous drilling, nut-tapping, shaping, and slotting machines. In this shop the line shafting is carried on cast-iron columns, and is driven by a vertical engine which is coupled direct. The far end of this shop is utilised as a grindery, in which are fixed five 7-foot grindstones. Twist, drill, and slide-bar grinding machines are also to be found here. The Baker's patent blowers for supplying the air to the various smiths' shop fires are fixed in this shop. Again crossing the traverser road we enter the carriage smithy, which is 176 feet long by 51 feet wide. Here are eight steam hammers, the majority of which were made at Nine Elms. These are used for stamping small forgings when required in any quantity. Also three saws for cutting hot iron, which have a lever feed. There are in all twenty-three smiths' fires, inclusive of bolt-making furnaces, arranged on either side of the building. Resuming our journey we make our way into the new running shed, passing on the way the brick factory, in which is made the fire-bricks for the brick arches of locomotives and furnaces at Nine Elms. The running shed is 235 feet wide by 180 feet long, and is capable of holding sixty engines. It is served by a 50-foot hydraulic turn-table. In this shed is fixed one of Pooley's weighing machines. Making our way from here into the old running shed, we find that several of the roads are used for lifting purposes. There is a machine shop attached for ordinary running

repairs. This shed is served by two 42-foot hydraulic turntables. Leaving here we proceed up the steam traverser road and pass through the carriage repair shops, which consist of two bays, each 254 feet long by 57 feet wide. These do not call for any special remarks, so we continue our journey to the carriage paint shop, which is a well-lighted building 210 feet long by 151 feet wide. It affords accommodation for painting between 60 and 70 coaches, and is heated on the "Perkin's" principle. Adjoining this shop are the waggon repair shops, consisting of two bays, each 208 feet long by 57 feet wide. Above these are waggon building and carpenters' and finishers' shops, a corner of which is utilised as a paint store, fitted up with the usual paint-mills, &c. On the same floor is the tinsmiths' shop, trimmers' shop, and general offices, including the drawing office, which is well lighted and fitted with twelve benches. Underneath these are the carriage repair and wheel shops. They consist of three bays, one 18 feet, and two 57 feet wide by 130 feet long. In the wheel shop are ten carriage and waggon-wheel lathes, and hydraulic press and pumps for putting on and taking off wheels. In the bay adjoining this is fixed a multiple spindle drilling-machine for Mansell's wood wheels, which tightly locks the wood segments together and drills all the holes, including the centre large one, at one operation. Also two straight axle-lathes and two wheel-boring lathes. Beyond these shops are two sheds, one for lifting carriages, and the other for lifting waggons. At the east end of the works, *i.e.*, towards Vauxhall Station, is situated a large shop, 225 feet long by 170 feet wide, in which is made the road vans and out-station furniture, and attached is a small saw-mill and smithy, with the necessary tools for quickly despatching this class of work; the remaining portion of the shop being utilised for light repairs and painting of coaches. Four of the arches under the main line are fitted up as dining halls for the workmen, the remainder being used as shops and stores. The South-Western Railway has now in operation about 850 miles of line, which is served by 550 locomotives, 3,000 carriages, and 8,000 waggons.

### BUILDING IN GLASGOW.

THE business for the past twelve months at the Glasgow Dean of Guild Court closed last week. During the year the plans issued by the Court were 237—viz, 47 dwelling-houses, 16 churches, halls, schools, &c.; 60 warehouses, workshops

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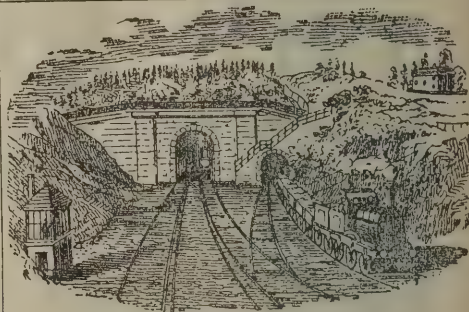


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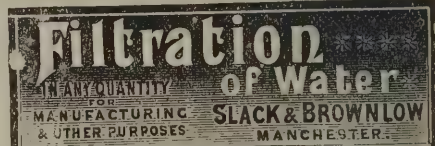
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and stores; 111 alterations on additions to properties, and 3 new streets—the total estimated value being 390,320*l*. This shows a slight decrease in number and value as compared with the previous year. Only in two cases have plans been submitted for houses of four and five rooms or upwards; the applications for small houses of one or two apartments have largely increased. This increase has been going on steadily since 1882, when the number of workmen's houses then intended to be built contained only 240 apartments, viz., 41 of one room and 199 of two rooms; whereas this year the number of rooms in similar tenements runs up to 926, viz., 233 of one room and 693 of two rooms.

### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

13632. Robert Platt, for "Improved automatic retaining catches for doors, windows and such like purposes, to be called Platt's automatic retaining catches." September 21, 1888.

13633. William Charlesworth, for "Improvements in window fastenings." September 21, 1888.

13645. George Major, for "An automatic air lamp." September 21, 1888.

13647. Henry C. Montgomery, for "Improvements in sewer-gas traps. (Complete specification.)" September 21, 1888.

13654. Comyn Ching, for "An improved noiseless chimney-breast ventilator." September 21, 1888.

13696. Charles Herbert Scott, for "Improvements in brick kilns fired by gas." September 22, 1888.

13700. Robert Middleton, for "An improved mode of securing windows, shutters, doors and the like, such as slide in grooves, and appliances connected therewith." September 22, 1888.

13721. Walter Chidwick Nangle, for "A new or improved

composition of paint, to be used for coating and preserving metal, wood and other substances and materials." September 22, 1888.

13731. Emil Heinrich Conrad Oehlmann, for "Improvements in or applicable to pumps." (Complete specification.) September 22, 1888.

13735. Jacob Ayton Archer, for "The manufacture of an improved material suitable for roofing purposes; also for advertising purposes, door panels and other purposes." September 22, 1888.

13761. Alexander Bobrownicki, for "Improvements in the treatment of towns' refuse and other putrescible matters." September 24, 1888.

13772. William Philip Thompson, for "Improvements in fastenings for doors applicable for resisting external pressure and for preventing fraudulent opening." (Fortune Terraire, France.) September 24, 1888.

13793. Charles Jones, for "An improved connection suitable for joining staircase panels or the like to the handrail." September 24, 1888.

13809. John Wilson and Alfred Richardson, for "Improvements applicable to window-sashes." September 25, 1888.

13812. James Russell Wellington, for "Saving life, to be fixed on pavement, for leaping or falling into from buildings or other places on fire or otherwise." September 25, 1888.

13844. George Lawson, for "Improvements in and relating to boxes or vessels for depositing or lowering concrete and such like material for foundations, &c., &c." September 25, 1888.

13893. Edward Ayrerst Reeves, for "Readily dividing a straight line of given length into any number of equal parts, and for measuring with precision any portion of such line." September 26, 1888.

13915. Frederick Charles Broadbridge, for "Improvements in window fastenings." September 27, 1888.

13943. James Henry Osborne, for "Improvements in sash fasteners." September 27, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

11519. John Taylor, for "Stench-trap for sewers and sewage purposes." August 10, 1888.

11589. Robert Hall, for "Improved means for attaching cords to sash-window frames." August 11, 1888.

11610. Henry Johnson, for "Improvements in bricks for pavements and floors." August 11, 1888.

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11623. William Lindsay, for "Improvements in the manufacture of supporting columns." August 11, 1888.

11663. Thomas Donnithorne, for "Improvements in the treatment of sewage." August 13, 1888.

11679. James Raper Thame, Lesser Repinski Jacobs and Thos. Griffiths, for "Improvements in cottage, hut, and other buildings of portable or temporary character, and in means and apparatus employed in their manufacture." August 13, 1888.

11715. Francis Philip Wheeler and William Owen Johnson, for "Improved method and means for instantly removing and replacing window-sashes, cords, and sash weights, for cleaning, repairs, and other purposes." August 14, 1888.

11889. Ellen Wilkinson, for "An improved window-fastener." August 17, 1888.

11896. Moses Piper, for "Improvements in instruments for measuring." August 17, 1888.

12356. Walter Berry, for "Lowering the temperature of cabins, saloons, corridors, and other places and passages on board ship; and the same being applicable for lowering the temperature of wards and rooms in hospitals, barracks, or other buildings." August 28, 1888.

12668. John Taylor, for "Stench-trap for sewers and sewage purposes." September 3, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

15453. George F. Redfern, for "Improved apparatus for giving an alarm in case of fire or other emergency, and for signalling or transmitting instruction or information relative thereto." (Louis Digeon, France.) November 11, 1887.

15477. Ch. L. Templer, for "Improvements in or relating to appliances or apparatus for raising or lowering or holding window-blinds." November 12, 1887.

10770. Henry Lee Hind, for "Improved door-fastener." July 25, 1888.

10955. Hans Henrick Schow, for "Improvements in door-stops and closers." July 28, 1888.

12107. Jos. H. Bean and William Gaines, for "Improvements in apparatus for closing doors and preventing slamming-to of the same." August 22, 1888.

#### PATENTS SEALED, SEPTEMBER 28, 1888.

11287. De Fonblanque Pennefather, for "Improvements in apparatus for ventilating rooms, chambers, cabins, sail carriage, and the like." August 18, 1887.

13877. William Bird, for "Improvements in the construction of street gullies." October 13, 1887.

7957. John B. Tongue, for "An improved appliance for preventing down-draught in chimneys and flues." May 31, 1888.

3292. John Burkhardt and William H. Jackson, for "Improvements in the manufacture of hollow ornamental studs, balusters, pedestals, &c." March 3, 1888.

#### ABRIDGMENTS.

"Improvements in stoves for heating the air of apartments, &c., by combustion of gas and air." No. 15167. 1887. William Jackson, Thorne Grove, Marnofield, Aberdeen.

*Claim I.*—A stove for heating air by burning of gas and air, consisting only of a closed chamber, with air inlet only by the burner, and with an outlet such that the heated products are not drawn, but force themselves thus through, there being passages or tubes for the entry and exit of air to be heated, substantially as hereinbefore described.

"Improvements in water-waste flushing cisterns." No. 15203. 1887. John Ward, 3 Glen Street, Hampstead Road, London.

*Claim I.*—In making inside the cistern the shape shown on drawing, and fixing axis (with overflow pipe) in a certain position, so as to make it oscillate when suspended.

*Claim II.*—In placing outlet-pipes, with small holes in same, standing up in the bottom of outside cistern, to give a quick flush and a steady after flush.

"Improvements in the production of white lead, &c." No. 10426. 1888. R. W. Emerson MacIvor, F.I.C., F.C.S., F.R.G.S., St. George's Club, Hanover Square, London.

*Claim.*—That I make carbonate of lead by the above process by causing acetate of ammonia or other alkaline acetate to act upon oxide or any other compounds of lead in vessels described and shown in figs. 1 and 2 on plan or similar vessels, and by introducing carbonic acid into the vessels containing the foregoing substances, and thereby producing the final product—carbonate of lead.

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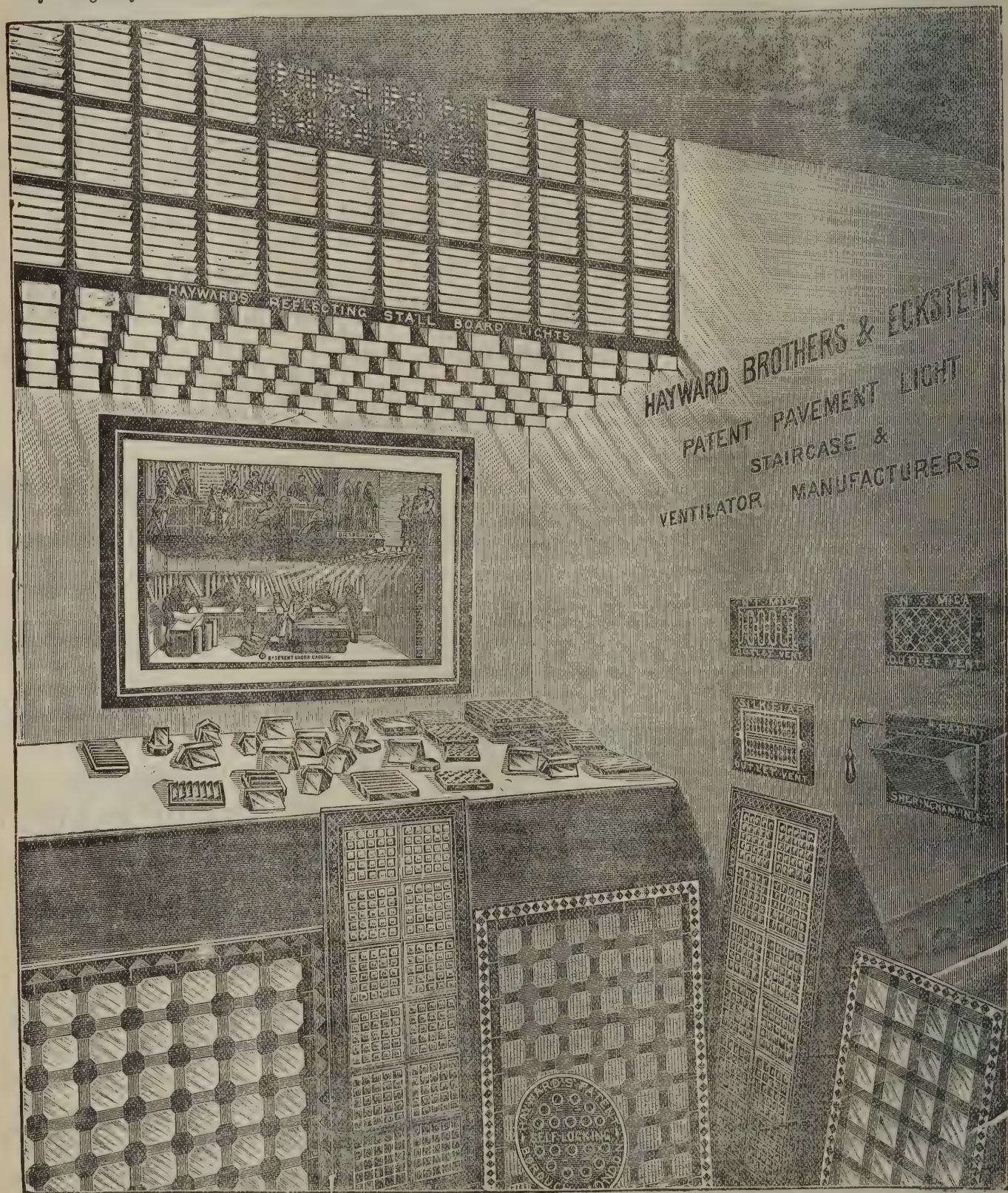
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 Friday, October 5, 1888.



# The Architect.

## THE WEEK.

WE regret to record the death of Mr. JAMES SELLARS, of Glasgow, which occurred on Tuesday morning. The International Exhibition there, which has not yet run its full course, will always remain associated with his name. It was, too, but the other day that he was presented to Her Majesty on occasion of her visit to Glasgow and the Exhibition. Successful in his profession, that success was detrimental to the prospect of living even an ordinary span of years. His application to business engagements left him powerless when the crisis came to rally from illness. Ten days was the utmost he allowed himself, in deference to medical orders that he should take a long holiday. In his work, moreover, he was accustomed to leave no details to be carried out by others that he could find time to do himself, and at home he was often engaged in what he called his "den"—an upper room of his house crowded with sketches and other items of professional paraphernalia—till the "wee" hours of morning. A career of prolonged success no doubt awaited Mr. SELLARS could he have lived to enjoy it. Apart from professional circles, many friends will regret his loss. Some of the best of Mr. SELLARS's works have been illustrated in THE ARCHITECT.

AN appeal has been made by the Société d'Archéologie of Brussels to the communal administration, on behalf of a scheme for the restoration of the church of the Sablon. A few years back the building was little known to strangers, but the changes which were made in order to secure suitable approaches to the new law courts has brought it into prominence, as it stands on the extension of the Rue Royale, and is opposite the square called the Petit Sablon. The church is a fine example of the Gothic of the fifteenth century, and was founded by the Guild of Archers. At present the walls and columns are painted white, with gilded caps, but originally there was much colour on the walls. If the interior is in good condition, the exterior is fast falling into ruin. Until the houses around were removed the condition of the masonry could be concealed, but now it is a discredit to the parish and the city. Unless steps are shortly taken to set about the work there will be no detail to copy, and the restoration will be imaginary. The grouping of the building is picturesque, and, if properly treated, would be an ornament to Brussels.

It is now beyond all doubt that the International Exhibition in Paris next year will not in any way interfere with the annual Salon. The Exhibition will be held as usual in the Palais de l'Industrie, which is excluded from the circuit of buildings that will be used as annexes to the Exhibition in the Champ de Mars. In the latter, French art is to be shown in all its phases; but, although the pictures of the early part of 1888 are admirable, there will be no space available for pictures of the later months of the present year.

AMONG the reports for the meeting of the School Board on Thursday, was a recommendation that a reference from the Board last March, instructing the Special Committee on the Work of the Works Department to direct Mr. EWAN CHRISTIAN to examine the Whittington, Carlton Road, and Manchester Street Schools, should be discharged. Mr. CHRISTIAN submitted a full report on these buildings, but the committee were of opinion that the report did not contain all the information asked for by the Board, and they requested Mr. CHRISTIAN in conjunction with Mr. RICKMAN to submit a further report. Mr. CHRISTIAN, in the course of his reply, says:—"I reported fully on April 23 last, and, on reperusal of what I then wrote, find nothing that I can usefully add. If the Board desires to know exactly wherein the foundations of those buildings differ from what is shown on the contract drawings it can be ascertained, but the examination will involve an extent of excavation and a disturbance of surface and general

school work and organisation, such as, in my judgment, would be quite unjustifiable. I cannot think that it can have been properly understood what is really implied by complete and thorough examination of the foundations of one of these large buildings." Mr. RICKMAN expressed his willingness if so instructed to examine the accounts, but stated that it would be necessary to get all particulars of quantities and measures of variations from the surveyors, and as the quantities for two of the schools were taken out by Mr. NORTHCROFT, he had little hope of obtaining them without long delay.

THE Marché de Madeleine of Brussels is known to most visitors, and especially to students of literature, for the Galerie Boittier, which forms part of the market, is monopolised by the secondhand booksellers. The market was constructed from designs by CLUYSENAAR, the architect, in 1848. During the excavations an immense number of coins of the seventeenth and eighteenth centuries came to light. The coins were made over to the director of the Monnaie Theatre, who was an amateur numismatist, for 39,681 francs. The Municipal Council of Brussels applied the money to rewarding the four labourers who exhumed the treasure trove. A pension of one half franc a day was awarded to each of them, with a reversion to their widows and children of the age of eighteen years. All the representatives of the discoverers of the coins have passed away with the exception of one widow, who has attained a great age. The Communal Council have, in consequence of the special features of the case, increased her allowance to 400 francs a year. Did the Lord Mayor of London, or any of the spectators in the Monnaie on Wednesday night, think for a moment of the passion for numismatics of a former director of the theatre?

A NEW lycée, intended for the education of girls, and bearing the name of Molière, was opened in Paris on Monday last. Everything that is official in France is supposed to be perfect, and in order to prove that the identification of the school with the playwright is correct, speeches were made at the opening to show that the purpose of MOLIERE'S comedies was to demonstrate the necessity of the education of girls in secular schools! It is evident that Paris has lost not only its old logic, but its sense of the ridiculous. However, with all its absurdities, the ceremony and the speeches brought the "palmes académiques" to M. PROUST, the architect who has been the representative of M. VAUDREMER in the direction of the works. The new school consists of four buildings of no more than two storeys in height, which are connected by a covered gallery on the ground floor, that will form an excellent ambulatory, unless at times when the rain will be driven into it. The ground floor is appropriated to classrooms (in which chairs are substituted for benches), a dining-room, kitchen, &c., and the first will be used for drawing schools, rooms for study, caretaker's offices, &c. The school will accommodate 350 students.

ON Monday next the Ecole des Beaux-Arts in Paris will open, and it is calculated that no less than 1,200 students will be present. Architecture can claim about one-half the number, painting has 400, sculpture 200, and engraving twenty students. As the students are expected to attend all the classes some of the architects may become fascinated with painting, or *vice versa*. Architecture is directed by MM. ANDRÉ, GINAIN and GUADET, and sculpture by MM. CAVELIER, FALGUIÈRE and THOMAS. Owing to the death of M. BOULANGER, there are only two professors of painting at present, MM. CABANEL and GÉROME. To fill up the vacant professorship a meeting of the Council of the Beaux-Arts has been summoned. If the interests of the students are alone considered the appointment should be given to M. JEAN-PAUL LAURENS. Artists are not decided about the merits of his work, which is, indeed, beyond the appreciation of the ordinary patron of art. But M. LAURENS is, in addition, one of those men who have an infinite capacity for taking trouble. If any of the members of the Council have observed M. LAURENS scrutinising pictures in the Salon as one of the jury, they must know that no less care will be taken to discover the good and bad points in the drawings of students.



### THE RETROSPECTIVE EXHIBITION IN BRUSSELS.

IT was inevitable that the law of compensation, which seems to be nearly as regular in its working as the law of gravitation, should prevail in connection with the Reformation in England under HENRY VIII. If there were gains there were also losses, and among them were many in connection with art. England, by the Act of the King, was severed from those parts of Europe where art was the most perfect, namely, France and Italy. The old traditions of design were set aside, and something had to be attempted, of which the weakness becomes manifest if we compare Elizabethan with Tudor ornament, or an old chalice with a reformed communion cup. Some notion of the extent of the destruction of works of art in churches, monasteries and nunneries may be derived from the notes of King HENRY's commissioners. About what was sacrificed in private houses we have no record. We may be sure that in England people were as much disposed as the Catholics throughout Europe to preserve things which were connected in some way with their religion, and which were, it may be assumed, as beautiful in form as similar things in churches. But few would care to oppose the King's will for the sake of a carving in ivory or a reliquary in metal; and, besides, from the change in belief objects of the kind lost their importance. That there was a general clearance of treasures which had passed from generation to generation as heirlooms in families is evident from the rarity of examples in the Mediæval metalwork, painting, sculpture, embroidery or illumination of England in public and private collections.

The beauty of the works may be taken for granted. In those days architecture was a power, and the details of a cathedral or a church served for models to the metalworker and the carver. A single example in the Brussels Exhibition reveals how great was the skill of the English goldsmith at a time which was supposed to be one of decadence. It is an ostensor, or monstrance, which is said to have been presented to the church of Notre Dame at Hal, by HENRY VIII., about 1513. It is almost entirely made of silver, and evidently parts are a direct reproduction from some English church. The King would hardly offer a work which was not made by one of his subjects; and, if so, it is evident that, in the early part of his reign, there were craftsmen who could execute work of a most refined kind, and, indeed, this English specimen, despite its colour, holds its own in the midst of a long range of ostensors. Yet, in a little time after he produced it, the artist must have discovered that his occupation was gone. A man who dared to make monstrances in London after the King had ceased to prize them, would soon discover that art was no protection.

The Belgians have been more successful than most peoples in preserving examples of Mediæval art, and a vast number of works in various materials can now be seen in Brussels, in an adjunct to the International Exhibition of modern industry. Although Mediævalism may be most largely represented, it does not, however, monopolise all the space. The periods of the history of industrialism are more or less exemplified. The first case in the Exhibition contains specimens of the attempts of prehistoric man to employ stone and metals for his needs, and the course of craftsmanship is followed down to a time which may be called recent. As a rule, there is some affinity between the contents of a case. In addition, there is a section which is arranged in a series of rooms in order to suggest the kind of furniture and ornaments which were in use at different times, or were characteristic of a town or province. There are *salles* for the fifteenth, sixteenth, seventeenth, and eighteenth centuries, a "salon Liégeois," a compartment devoted to arms, a "cuisine," &c. As the part of the building in which the Retrospective Exhibition is held is curved on plan, it appears to be larger than it is in reality, and it must be said that little space is left for visitors.

A collection containing about four thousand objects, and not one of them wanting in interest, is not to be adequately described in an article. All we can do is to point out the general characteristics of the Exhibition by alluding to some of the more remarkable works.

It is not necessary to say much about the prehistoric

parts. The early stone weapons have little variety, and to see one case containing them in a museum is to see all. Belonging to a later period is a remarkable and very large funeral urn, which evidently belonged to a woman who was distinguished, as a sort of diadem was in the urn. There was also something more prosaic in the form of a large bone, from which the flesh had parted, and which may have been intended as food in the peregrinations of the defunct through the unknown world.

The district about Namur has been well worked by a local archæological society, and some of the remains exhumed form an interesting collection. It denotes that at an early period the art of enamelling was applied in Belgium for ornamentation of brooches, rings, and bracelets. It may have been derived from the Romans. The ornamentation is generally of the interlaced patterns which are associated with Celtic and Norse work. But it must be said that the lines are rarely graceful, and would seem to be derived from descriptions of patterns rather than from the patterns themselves. The colour is always excellent, especially in blues, and the paste is even in texture. It is apparent that at an era which was prior to the introduction of Byzantine enamels in Western Europe the Belgians were skilled in the chemistry of fluxes, and in the arrangement of the partitions or cloisons.

At a much later period Namur seems to have again succeeded in enamelling, that is, if we assume the triptych in another case to be produced in the district. In it we see an example of translucent enamel, which at one time was in favour for reliquaries in Belgium. From Namur, also, comes a most delicate statuette of a bishop in a shrine set with coloured stones, which are also introduced in the drapery of the figure, one being at each fold of the amice. Through the influence of BALDWIN in the Crusades, Belgium was enriched with many examples of Byzantine art, the dragons on church spires being supposed to be among them. A crown set with precious stones and ornamented with filigree from the Cathedral of Namur, is described as being brought from Constantinople in 1205. In "Baedeker" the date is said to be 1429. There is also a fine case for the crown, which, too, is evidently Byzantine work; the top is adorned with medallions. Ivory tablets for writing, like those seen in the Namur case, are very rare, but of the small cradle (which like most Mediæval work is highly coloured and gilded) there are other examples in the Exhibition. They are generally about a foot in length, and from their preservation it is reasonable to imagine they were used to recall the Nativity rather than as playthings. In some a small figure is placed which is evidently of a later date.

But none of the contributions from Namur can compare, if judged as works of art, with a collection from a nunnery in that town, all of which is said to be the work of an Augustinian monk (VAN DER GOES, the painter, belonged to the same Order) named HUGO. He was one of the artists who lived in the early part of the thirteenth century, and if it were asserted that he was the greatest of the men who worked in the precious metals at that time, it would be difficult to bring proof to the contrary, or, in other words, to discover objects which are superior to his handiwork in this Exhibition. In no museum have we seen greater finesse in the treatment of vegetation and of small animals, or more perfect curves in rinceaux. One work is enough to suggest his skill as an artist. A four-armed Byzantine cross, most refined in its enamel, medallions and filigree, was given to him in order that he might make a base for it. He recognised the beauty of the Eastern work, but he did not attempt to imitate it. Hugo entered into competition with it; he applied Gothic ornament equally minute and no less beautiful. A missal painter might envy the delicacy of the detail which he introduces. But he was equally facile in different works. The large chalice or ciborium (No. 153) is a model from its proportions and contours. On one of the ornaments of a book of Gospels, Hugo has introduced a figure of himself in a circle of about the circumference of a shilling. He is kneeling, and holds the book with extended arms above his head. On the opposite side is a medallion showing St. NICHOLAS seated, to whom the book is supposed to be offered by the monk. A phylactery, which probably is used as a breastplate for a cope, suggests how well he succeeded in works which were to be magnificent. A cross and two fine



reliquaries belonging to the church of Walcourt are attributed to HUGO. Treasures of this kind are found only in places which are closed to the tourist in Belgium, and their appearance in an exhibition is a boon for archæologists of all countries.

Two of the finest "châsses," or coffers for relics, in Europe are those of "Saint Hadelin," belonging to Notre Dame in Huy, and "Saint Maur," lent by the Duc DE BEAUFORT. The former has the appearance of a work in bronze, ornamented with flowing lines in gold, and, it is said, dates from the beginning of the twelfth century; but some archæologists maintain that prior to the thirteenth century the châsses were simple in form and were coffins rather than coffers. The Huy châsse wants the ornaments which were formerly on the sloping roofs, but fortunately the figures on the sides are preserved in their simplicity. On one of the ends is a figure of CHRIST, who holds a globe, and is represented as beardless—a departure from the usual practice of the West. The châsse de Saint Maur is startling in the brilliancy of its gold plates, and one wonders how it could have withstood the vicissitudes of seven centuries without having a stain. It has the figures on the roofs as well as on the sides, and in style of treatment is not unlike the châsse from Huy. Both works have more of the Romanesque vigour than of Gothic delicacy. There are other châsses, but they belong to a later period.

Several crosses, having a variety of forms, are placed together. Those numbered 39, 43, and 44 have each four arms, and consequently resemble the crosses used in the Greek Church and the pectoral crosses of Western archbishops. One cross is a sixteenth-century Italian work, with ornament of nielli, which is charming in its detail, and without any of that suggestion of being manufactured which sometimes characterises Italian work. The ostensoirs, which are used for the ceremony of the Salut in churches, show a variety of forms, but all are now superseded. The form in use may have been suggested by phylacteries like the one by HUGO already mentioned. The largest is the ostensoir of HENRY VIII., but from the mass of silver it looks cold when seen beside its golden companions. From the thirteenth to the sixteenth century the aim of the goldsmith was to make the ostensoir a sort of shrine, and in that view the architecture of the time was faithfully imitated. Probably they were all designed by architects, for as late as 1708 we find an architect supplying a design for the great ostensoir which is in Notre Dame, Paris. In many of the encensoirs, or thuribles, we also see the influence of architecture. It was supposed that no better plan could be devised for the passage of the smoke of incense than by having an imitation of windows full of tracery. One thurible was evidently derived from one of the German Romanesque churches. Looking at these examples, it is evident that the furniture and accessories of the Mediæval services bore a close relation to the building in which they were employed. It was again reproduced in the reliquaries which were found in houses, and in this way architecture exercised its sway not only over societies, but upon individuals.

According to M. VITET, there is also a close connection between the architecture of a period and the style of calligraphy then employed. But what is more likely to strike a visitor on seeing the illuminated manuscripts at Brussels is the brilliancy of the colours and of the gold. They might have been finished yesterday, so few are the signs of age on the drawings. Does not the condition of the manuscripts suggest that water-colour drawings should not be exposed to strong light? The illuminated volumes are generally kept closed or covered, and they continue to be as unchanged in colour as in outline. Some of the manuscripts were originally in the library of the Ducs DE BOURGOGNE. An Italian missal which belonged to MATHIAS CORVIN, King of Hungary in the fifteenth century, shows figures well executed, but they lack the *naïveté* which generally characterises the Western illuminations. One manuscript is open at a place where the letter "C" is formed by a combination of the four Evangelistic symbols. In another ADAM and EVE are seen standing at the foot of the Cross. There are two splendid examples of Eastern illumination, which by some people may be considered as superior to those from European monasteries, as

the ornament is entirely conventional and without any figure pieces. It is impossible to say whether the Eastern or the Western colours are more perfect in condition. One belonged to SHANK NAMAH DE FIRDOUSI XVI., a name which recalls "Lalla Rookh." The other is from Persia, having the ornament in blue and gold. It was a present fit for a king.

Many grand specimens of the reredos are to be met with in the Exhibition. Lombeek is not a place lying in the route of the traveller, but it contained a remarkable specimen of a reredos which is now in Brussels. It represents the life of the Blessed Virgin in a series of deeply-sunk panels, with figures in high relief, and which are most animated in action. The care taken to represent the architecture, furniture, &c., was a recognition of the importance of art in those days. Near it is a crucifix of large size from the church of Oplinter, and which is supposed to date from the thirteenth century. The colour and expression of the life-size figure are most vivid. This work is more effective than many of the modern representations of the Crucifixion, where the figure of CHRIST is detachable from the cross, yet it will be found that the figure is in low relief, and carved from the same piece of oak as the cross. The arrangement and the colour are so contrived as to produce the effect of very high relief. Many smaller reredoses and carvings are shown. One group in relief bears a resemblance to a similar scene by MEMLING in St. John's Hospital, Bruges. Among the statuettes is one which is covered with plates of thin copper that are beaten to correspond with the work beneath. It is evident that long before St. SEBASTIAN became a stock subject with Italian painters, he was selected by the Belgian wood-carvers. From Notre Dame (the cathedral) of Antwerp comes a statuette in which CHRIST is shown playing with His mother's cheek, probably the earliest example of that sort of action. But among all the statuettes of the *Virgin and Child* in the Exhibition precedence must be given to one in ivory belonging to Baron OPPENHEIM. Less care seems to have been taken with the figure of CHRIST than with the Blessed Virgin, to whom the sculptor imparted the placidity, the silence, the mystery of Egyptian sculpture. The treatment of the drapery adds to the effect produced by the expression of the face and the pose of the figure; it is in large folds unless near the shoulders, where it is tightened to express more power. The statuette is ascribed to the fourteenth century, and if similar style could be adopted in our modern imitations of Mediæval sculpture, there would be no more cavils about distorted saints. A thirteenth-century statuette of the Blessed Virgin in the same case is a realisation of a still more severe ideal.

The lutrins, or lecterns, merit a word. Those having an eagle for supporter are most common. There is one with a pelican from Tirlemont. Another rare variety is the griffin lectern. One from Andenne is so powerful as to suggest that the designer intended to suggest an evil spirit. Paschal candlesticks, lustres, and chandeliers will be found near the lecterns.

Vestments, altar-frontals, tapestries, carpets, embroideries, &c., fill many cases in the Exhibition, and there are several examples of stuffs from Eastern looms. It is plain that after the Crusades the countrymen of BALDWIN of Flanders recognised the advantages of traffic with the East. Seeing the richness of the old textiles in the Exhibition, it is not difficult to imagine the fine apparel of the Belgian ladies at one time, and which wrung the confession from JOHANNA of Navarre, that she was no better dressed than the women of Bruges.

The secular work is abundant. A favourite Mediæval legend is recalled by the group of ARISTOTLE and his mistress, an allegory of the servitude of man. M. ZSCHILLE has a collection of over 700 knives, forks, and spoons, representing a chapter in the history of evolution. The collection of *argenterie de table* is worthy of a country which at one time was remarkable for its wealth. Amateurs have contributed specimens of Belgian and German glass; the watches which the Marquis DE RODES bequeathed to the Museum of Antiquities are now in the Exhibition, and no less interesting are the French watches of the sixteenth century. Several interesting *bijoux* come from the stores of Mr. EDWARD JOSEPH, including some miniatures by COSWAY. Among the bronzes is a noble figure of *Neptune*,



by JOHN of Bologna, and a *Perseus*, which is attributed to BENVENUTO CELLINI.

A new world seems to be reached when we come to the cases containing examples of Sèvres and Chelsea ware. As was to be expected, the collection of delph and other Belgian faïence is very large; but it must be admitted that whatever may be our shortcomings when compared with the past, there is nothing in all the cases which in design will bear comparison with the faïence of Messrs. DOULTON. The beautiful statuettes in white porcelain suggest how much is lost in England by neglecting this branch of art, although at one time Alderman COPELAND demonstrated that English porcelain was not to be surpassed by any from Saxe or Vienna. As long as Japanese monsters are accepted as the highest ornamental art it would be vain to hope that sculpture will be popularised in England.

To virtuosos the musical instruments will be the most attractive. Among them is a violin which is one of the last made by old STRADIVARIUS; another by the same maker, which belonged to PAGANINI; a viola-de-gamba, which was made for FRANCIS I.; a lute belonging to M. EMILE WAUTERS, and which may have served as a model for one introduced in his painting in the Brussels Musée; two virginals, &c.

Space will not allow us to describe the Exhibition at further length, but it may be said that in variety and interest it surpasses the first of the exhibitions of loan collections at South Kensington. The authorities have wisely decreed that an extra fee must be paid for entrance to the Retrospective Exhibition. In consequence the galleries are never crowded, and students of archæology, artists, and amateurs are able to examine the treasures at their leisure.

### MISTAKES IN ARCHITECTURE.\*

BY PROFESSOR T. ROGER SMITH.

(Concluded from last week.)

#### Architects' Mistakes.

WE have now reached architects' mistakes, and there seems to be good reason for occupying such time as is left chiefly with mistakes in practice. Still there are one or two remarks on design which I am tempted to hazard, and which I think can usefully be made. Remember, then, that it is a great mistake to attempt in designing to use what you do not understand. Just as in Egypt the captive Israelites could not make bricks without straw, so you cannot design without materials, *i.e.* without being familiar with the forms, features, and ornaments of the style in which you are working, and with the manner in which those elements have been put together by successful architects before your time; and without, moreover, being practised in the application of that knowledge.

If you want to see examples on a large scale, numerous, costly, and distressingly instructive of what making architectural bricks without this sort of straw comes to, just walk through the various streets and courts of the City of London. Side by side with some of the best buildings of our best architects you will see costly works, substantial and pretentious, designed by men who can have had no intimate knowledge of, and scarcely any training in, our art, and who have in most cases been employed because they were known to moneyed men as trustworthy surveyors. Such have doubtless built soundly, but their works are architecturally failures. Getting together this straw—to return to the old figure—is no easy task. It takes a long time and a good deal of pains to gather information enough, and to develop skill and experience enough, to make a really good architectural design, and to work it out in all its details; yet it is unwise to start practice till this can be done. Sometimes circumstances or the offer of work render it almost necessary for a student of only a few years' standing to begin on his own account; but it is very rare for those who start prematurely to succeed in doing good architecture, unless they have the resolution, after completing their first works, to stop, and go abroad and finish their studies and then come home and resume.

I am tempted to add that a new style is a mistake; not that a new style is in itself impossible, but that it is impossible to you or me. It is idle to suppose that the genius of any one man could successfully work out a new style that his fellow-men would feel to be appropriate. Looking round on the motley variety of styles which prevail in modern Europe, we are tempted to believe that it is a matter of no moment what

style be brought in and used. Yet a little observation will show you that it is not so. No architectural style is practised in England (to limit our notice to the country under our eyes), various as the styles that are or have been in vogue may be, unless its roots are deep and wide in the history or the sympathies of the English people. Greek, which was the style of our grandfathers' time, was welcomed at a time when every man of education in England was, or wished to be thought, a Classical scholar. Scholarship is on the wane and there is now scant encouragement for the practice of Greek architecture, though to learn it is as needful as ever. Italian Renaissance is intimately connected with modern as distinct from Mediæval feeling and life, and has become universal in this as in other countries of Europe, just because it is identified with that which England has in common with every modern European country. Gothic is the architecture which was a native of this country during the whole of the Middle Ages. Queen Anne is Dutch architecture, and belongs to a set of things which became incorporated into our national life at the Revolution, when Holland gave us a king. There have been, on the other hand, various attempts to introduce other styles with which there exist no such links, but the attempts have failed. For example, no permanent result followed the efforts of that most able architect Owen Jones, to introduce Mahomedan architecture into this country—efforts in which he was virtually without followers. If there is any truth in these views, and I believe there is no gainsaying them, we have no reasonable ground for supposing that a new style could live and thrive, even if a great man had the genius to devise such a thing. If it comes it will grow, not be made.

Every apparent novelty in architecture should be viewed with great distrust, as more likely to be a mistake than a success. That novelty is both possible and desirable is self evident, but beware of what seems to you to promise to be extremely and strikingly novel. It has probably been tried before and given up as less good than the received way, or, if that be not the case, still there is great risk of its being the blemish instead of the blossom of your work—a mistake instead of a discovery. The one defect of importance in St. Paul's Cathedral occurs at the crossing of the main avenue and the transepts—the one part where its great architect has departed most widely from the practice of other church builders, and has, in the search for novelty, sacrificed more than he has gained, clever though the disposition of the piers that carry his dome undoubtedly is.

#### Mistakes in Practice.

In practice—that is to say, in the practically carrying on of the profession of architect—no more grievous mistake can be made—nay, I think, none so grievous—as taking bribes. An architect who accepts illicit commissions, or does nominal work for large fees, or who allows any other of the expedients by which receiving a bribe is made to look as if it were a business transaction, to be practised upon him, has sinned against the very first duty of a professional man; he has sold that independence which ought to be his most cherished possession, and has put himself under the thumb of the very persons whom he ought to control. The wisest of mankind says, "A gift destroyeth the heart," and it is not possible to be more forcible, more terse, or more true. There are sure to be times when very specious proposals will be made to most of you, and when it may appear almost quixotic to decline money which you sorely need, but whenever any case occurs in which you honestly doubt whether the transaction is one for you to agree to or not, I will suggest a practical test. Imagine yourself cross-questioned as to the entire affair by some such master of the art as Sir Henry James, before Mr. Justice Hawkins and a jury in open court, and if you at all doubt whether you would come off with credit, pray take that as an indication that the doubt is well founded, and the proposed transaction should be declined with thanks.

Anything that is in any way unfair is a mistake as well as reprehensible. It is wrong; it is also bad policy. Believe me, there is no truer word than that "Honesty is the best policy." It is both dishonest and a mistake to get work away from a professional brother, or to undersell the profession by working at a rate below the recognised and fair rate, and it is equally a mistake to overcharge a client. Either of these may be expected to bring an inevitable train of bad consequences, a retribution, in its wake. It is generally speaking a mistake to work for nothing. You may occasionally do it in the case of charities in which you are interested, but I think a guiding rule should be not to do it in any case except where the work is so in your own connection that under any circumstances it would come to you. To do work for nothing, and thereby deprive some other architect both of the work and the fees, is extremely bad.

I think there remains no worse mistake to note than temper. Temper is a mistake—a ship without a rudder, a horse without a rider, or a stream that has burst its banks, are apt illustrations of the condition of a man of business who

\* Opening lecture at the commencement of the Session 1888-89 at University College, London.



has lost his temper. Above all things an angry letter is a mistake. Make it a rule never to write a line while you are angry; for, somehow, an angry man's pen seems dipped in permanent gall rather than ink, and his written words unluckily have not the same chance of being either promptly answered, and then forgotten, or good-naturedly overlooked, that hasty spoken words often have. A letter written in heat is read, you must remember, in cool blood. If something raises your wrath, and you sit down and fire off a withering epistle, the best thing you can do is to put it in the fire there and then; the next best, to keep it twenty-four hours, and then reconsider it; and the next best, to show it to a judicious friend.

One in high station, who had been much irritated, and had written a splendid and stinging reply, took it to the most influential man whom he knew. The chief—I think it was Palmerston—read it right through without a word, “Got a copy of this letter?” “No.” “Not even a rough draft?” “No. I wrote it straight off.” “Very injudicious letter. Much better burn it”—and, suiting the action to the word, the great man put it into the fire, and coolly held it there with the poker till there was no shred left. That was the action of a true friend.

I must, at the same time, point out that just anger is not the same thing as giving way to temper. The ability to exhibit indignation at the right moment, if kept perfectly under control, is very useful to one who has to supervise works or direct men. The just anger of a superior is generally dreaded, and to an extent far beyond what one would expect or can quite explain. If, therefore, you are able at the proper moment to show an offending artisan, foreman, contractor, or tradesman, that you are justly and with good reason roused to anger, it will generally help you in the control of the works under your direction.

My reference to an angry letter as a mistake makes it suitable here to add that we are liable to make mistakes by writing where we ought to speak, and speaking where we ought to write. Writing is quite permanent; therefore it is far more fit than our fading memories to record anything that should last. It is quite inelastic, quite unyielding; so it is unfit for anything of the nature of give-and-take. In all negotiations, explanations—above all, whenever there is a difficulty or ground for dissatisfaction—see people, at all sacrifices, in preference to writing them. At such times it is a mistake to write. On the other hand, if any specific order has to be given, if any definite objection or complaint has to be made, or if any agreement has to remain in force for any length of time, it is equally a mistake not to put it in writing. Your order, your complaint, your contract may often be originally done by word of mouth; but, in such cases, they should be afterwards repeated in writing, for accuracy's sake.

In architectural practice delay is a mistake. It is not always possible to be prompt, but it is far more possible than persons who habitually procrastinate are willing to believe, and from first to last it will greatly add to your chance of success if you are prompt. At the first inception of an undertaking, whether the client be eager or the reverse, it is equally prudent to do some thing at once. The eager client is balked if he find nothing done after a short time, perhaps changes his mind as to doing the work at all, or more possibly changes his architect. The lukewarm and indifferent client, who might by a promptly-prepared sketch have been encouraged to go on, is disheartened, or turns to something else, or postpones or abandons his intention. Were I to trace the work of an architect all through, it would be easy to show that at every succeeding stage delay is a mistake, though I am bound to admit that it often can hardly be avoided. Carelessness is a mistake, and one into which not a few men are apt to fall. The saying is attributed to Goethe, that “Genius is the art of taking pains.” The common notion of genius is that it can do without taking pains. I do not ask you to accept this definition of genius as exact, but it covers half, and more than half, of the truth, and it would, I think, be perfectly true if you altered the wording and said, “The secret of success is the art of taking pains.” Watch a successful man in the exercise of his art or pursuit, whatever it may be; you will see him all attention, all devotion to the business in hand. Consult an eminent physician, and you see by his questions, his air of concentration, his whole method, that for the time being your constitution, your ailment, and what to do for you in order to relieve you, occupy his entire and undivided attention and thoughts. It is chiefly this habit and power of concentration which has made his pursuit of medicine successful, has enabled him often to baffle disease and restore health, and has gained him reputation.

Read any good life of any prominent public man (as, for example, read Mr. Street's life lately published), and you will see what incessant, eager toil and watchfulness occupied every hour of his day, and his night too. Nor is it less easy to remark in recreations that success can only be secured by great pains, however clever you may naturally be. Watch an angler who is known to be habitually successful, his keen attention, his constant thoughtfulness about tackle, flies, water, the

long hours he will devote to fishing, and the eager pursuit of his game. A champion player in any athletic game, rowing, cricket, tennis, football, rifle-shooting—what constant practice! what a watchful eye for every turn of the game, every detail of the pursuit! Now if you are to be successful in architectural practice, you must set about it in the spirit, temper, and method of Grace at his cricket, or Renshaw at his tennis, or a Queen's prizeman at his rifle range.

It is, however, possible to throw one's self into the interesting part of a pursuit, and to remain indifferent to details that do not of themselves attract or that seem insignificant. This, though of course better than being languid and careless about the whole business, is likely to lead to trouble. In the conduct of works, then, it is a mistake to neglect small matters, though it is equally a mistake to fuss. There are plenty of proverbs to enforce the importance of apparent trifles:—“Take care of the pence, and the pounds will take care of themselves”; “Do not lose the ship for a ha'porth of tar,” and so on. In every building there occur a certain number of apparently little points which must receive the architect's careful attention, but which one is naturally more inclined to leave to others or to chance than the questions that affect large parts of the fabric. The difference between the important and the unimportant does not, however, lie in their magnitude, or their cost, or their conspicuousness. Take a gold watch: the most conspicuous and the largest part of it is the case, and whether it be the most expensive part or no, it is certainly of the most expensive material, while the hair-spring is barely visible, of a cheap metal, and, compared to the case, of little money value; yet you may batter the case about, or deface it in a hundred ways, and the going of the watch may escape, but you cannot in the least interfere with the hair-spring, not in the most minute particular, without impairing the accuracy of your timekeeper or stopping it altogether. In a house it is much the same. The main walls are a costly part of the building, but they may be considerably damaged, decayed, or mutilated without a tithe of the inconvenience to the inmates which will occur if their chimneys smoke, their taps yield nothing but lukewarm water, their ovens will not heat, or the water runs off from their cisterns. The same thing is often true of the artistic effect of your work. You have, let us say, a Gothic church in hand, and labels over the windows springing from carved bosses. You carelessly place the bosses below the springing line instead of above it, or you in ignorance draw them so. That small blunder produces exactly the effects on the eye of a cultivated observer that would result to his ear from your talking about *hart* or *harchitecture*, and, in its way, the proper placing of that one detail is as essential to the success of the design as the most ambitious or elaborate of its features. It is therefore a mistake to consider that any single thing essential to your building is unimportant or may be safely neglected.

There is, however, an opposite: fussiness is a mistake. It is fussiness to visit a building too constantly, or to interfere for the sake of interfering. You must not forget that if as architect you have the power of making alterations, every alteration, even if it be an improvement, means delay and expense, and that delay and expense are among the worst evils that can afflict a building. One of the most troublesome and unsatisfactory disagreements I ever had to unravel grew out of the architect, a man of real ability, having little other work in hand, paying a visit at least every other day to the works, and never going without ordering something to be done or undone. The accumulated effect of these orders was months of delay and claims without end for extras, while for all practical purposes the building would have been quite as serviceable if carried out exactly as shown in the original plans and specifications without any of the modifications and improvements.

I am quite aware that one cannot expect people's minds to cease working when once a contract has been signed, and that it is proverbially “never too late to mend”; but, on the other hand, you may “buy even gold too dear.” “A rolling stone gathers no moss,” and there are few improvements which are really worth the cost, delay, and annoyance that come of interfering with a contract which has once been settled and accepted. In short, generally speaking variations are a mistake.

Mistakes in dealing with your clients are especially to be guarded against, because they generally injure your prospects in life, yet they may occur in so many different ways that it is impossible to catalogue them. Many if not most instances of miscarriage between clients and their architects appear, however, to start from one root, namely, from mistaking the duty you have to discharge, or forgetting to keep up the proper relation of architect and client. Your duty may be described thus: to form a correct idea of what your client wants and wishes, and to do your best to obtain it for him. Your relation to him is purely professional and not that of friendly intimacy, or equality, or good fellowship, or boon companionship. There are cases where an architect forms an idea of what a client wants, but which does not correspond to his wishes, and then there is sure to be dissatisfaction. There are cases where an



architect forms a notion of what a client wishes, but fails, till too late, to realise that it is not what he wants. The result again is dissatisfaction. There are cases in which the architect troubles himself little about either the wants or the wishes of his client, and works out what in his judgment they ought to be. Same result. Lastly, it has sometimes happened that the architect and the client, or one of them, have forgotten to maintain their intercourse on the proper professional footing, and if any cause of disagreement arises these cases end in the bitterest of quarrels. Professor Cockerell—a prince of architects—used to say to us, “Be a gentleman among artists and an artist among gentlemen.”

As one illustration of perhaps the most common form in which this sort of misunderstanding of the architect's duties develops itself, I will take the case of a dwelling-house. The architect busies himself to learn what his client's wishes are, and he takes no small pains to put them into shape, and he, perhaps, designs something which is very like what his client would like. But he neglects to realise exactly what his client wants. Let us suppose that his client is a man of moderate means, who cannot trench upon his income, and who has, let us say, 2,000*l.* to spend, and that what he really needs is the best house that can be had for a couple of thousand pounds, all which his architect might have found out had he taken the trouble. When the lowest estimate for the design comes in at over four thousand, the whole thing is abandoned in chagrin and disgust, and the architect too late realises that he ought to have found out what his client needed as well as what he wished.

The relationship between client and architect involves the necessity sometimes of very plain speaking, and the more thoroughly professional the bearing of the architect has been, the more thoroughly is it possible for him to discharge this sometimes painful duty with perfect effect. For example, in the case I have suggested, had the architect quite realised the case, he would at some period have had to say, “You cannot within the limit of expense that is prudent build anything either so ornamental and so roomy as you want; the design must be plain, some rooms given up, and the others kept small,” and so on. Whenever any such necessity arises, believe me, it is a mistake to shirk or postpone the unpleasant duty. Meet it squarely and fairly and with good temper.

In dealing with those employed on your works, it is a mistake to suppose that every contractor, tradesman, or artificer is a thief or an extortioner, and every quantity surveyor a kind of contraband agent. I have put it strongly, but the suspicious temper of mind at which this remark points goes sometimes far towards a tone of feeling as exaggerated as this. The fact is that your contractors and tradesmen are engaged in one of the most complicated and difficult businesses possible. Their motive for carrying on the business is to make a profit, and you should look upon it as a matter for sincere regret if a profit is not made by the contractors on your works. You and they are engaged together on the difficult task of erecting a building, and if originally you know them to be respectable, by all means treat these people as co-operating with you and aiding to give reality to your designs, which is their real position, and do not suspect unfair dealing till some proof of it begins to show itself. Such a course will be much nearer the fair and proper mode of administering a building. While I recommend this tone of mind I do not recommend that you should cease to be vigilant and careful. It would be quite as great a mistake to abandon watchfulness as to abandon confidence gratuitously, and it would be a departure from the line of conduct which your duty to your client prescribes to you. It is perhaps hardly necessary now to say anything about quantity surveyors, but I know that when I began practice, there was a kind of uneasy feeling in the minds of some of us, as though quantities were a kind of illicit trading, and those who prepared them akin to smugglers. If any of you share these notions now, permit me to assure you that they are a mistake, that the profession of a quantity surveyor is a most honourable and confidential one, and that the work they do is now indispensable to the conduct of building operations of any magnitude or complexity, and the assistance they render to the architect very valuable.

This mention of contractors and surveyors will serve to introduce another subject that should be noticed. It is for a beginner a mistake to employ second-rate or unknown men, either as builders, manufacturers, or quantity surveyors. When you have established your position and gained a reasonable amount of reputation and experience, do as you like, but in early days you cannot afford to employ people who are not first-rate. It is of vital importance to run no risk of failure in your early works, and the employment of thoroughly reliable persons will greatly diminish that risk, and their known position and trustworthiness are a great safeguard and help to you if any part of their work should go wrong; and to some extent the same caution is a prudent one as regards new materials and untried modes of construction. A fortunate accident on the very first matter of any importance ever put into my hands revealed to me the value of employing known men. The work

came from a man of business in the country, and I was I know looked upon with distrust by his London agent, who saw me for him, as young and untried. Fortunately, after making out some drawings and a specification, I got an estimate from a contractor of good repute, and I well remember how, when I went with the whole to my new client's agent, his face brightened up when he saw the signature of a man whom he knew well as competent and trustworthy, and by whom, ultimately, by-the-by, the work was excellently done. I urge this the more because young men often are more exposed to the temptation to get their work done in the very cheapest way than they will be in after life.

It appears to me to be as much a mistake for a practitioner of architecture to isolate himself as I earlier pointed out it is for a student. If there be no suitable associates within reach, it cannot be helped; but in nine cases out of ten there are brother professional men available. Just as you gentlemen, as students, can learn a great deal from one another, and will lose much of the stimulus and encouragement which make work go well if you do not in some way work in company, so in after life also you will derive great benefit and great pleasure from the society of those who are working at the same profession as yourselves, pursuing the same aims, encountering the same difficulties, delighting in the same studies; and you will be able to render assistance to your professional friends as well as to receive it from them. There are many circumstances under which two architects have to meet as representatives of two clients differently affected by some building operation. You can hardly imagine till you have had experience of it how much better all this class of business is got through if the two professional men know one another; or if even they only know each other as members of the Institute or of the Architectural Association, or in some such relation, than if they meet as absolute strangers. There are also many circumstances in which it is of inestimable importance to an architect to be favourably known to the members of his profession, and I strongly urge you all to begin in this classroom and the Association and Royal Academy schools to work together, and in after-life to belong to the Institute, and not only belong to these societies but give some attention and time to their work. An architectural hermit is a mistake.

It is not necessary, I hope, for me to offer proofs that most of the mistakes named deserve the name. I think your own good sense will have recognised, as we went through them, that they merit, each of them, a place in the list of things to be avoided. Some of these mistakes I have myself made, and have found to my cost that they are what I have described them to be. Others I have happily escaped, but I have seen them made, and know that their consequences are not good. There is only one more mistake that I shall allude to, and it is a lecturer's mistake. There is no greater mistake for a lecturer than to be tedious, and lest I should fall into that mistake, I propose now to bring this lecture to a close. It would have been possible to go on much longer, but what has been said must suffice; and yet it is impossible to end without one last word of encouragement, in which perhaps some of you may find a clue to keep you free from not a few mischances.

To steer clear of every error is impossible, but what I wish to say is that good sense, right feeling, and thoughtful attention to your work will go far to preserve you from any very serious slips. Years ago a pupil of mine acted as clerk of works on a job of mine where there was a great deal of masonry, and something which he told me about that masonry seems to convey a lesson. He noticed that some of the masons, as soon as they got a block of stone out of which to cut a feature of the building, set to with mallet and chisel, and in ten minutes were hard at it. Others would spend an hour or two or possibly a whole morning studying the block of stone on every side, considering exactly how best it could be utilised, and in short laying out their work before they put their hands to it. The men who made mistakes in their work were masons of the first group, not of the second. Perhaps this observation may suggest to us a method by which we may avoid mistakes in our work.

#### THE LATE MR. JAMES SELLARS.

IN a notice of the professional career of the late Mr. James Sellars the *Glasgow Herald* gives the following account:—

Mr. Sellars was born in Glasgow in the year 1843, and about thirty years ago he entered the office of Mr. Hugh Barclay to serve his apprenticeship as an architect. Subsequently he occupied the position of draughtsman with several of our local architects, ultimately entering the office of Mr. Campbell Douglas, with whom in course of a few years he became associated as partner, under the firm of Campbell Douglas & Sellars. The name of Mr. Sellars came first conspicuously before the public in connection with the Stewart memorial fountain. Soon after he joined Mr. Campbell Douglas, and before he was a member of the firm, competitive



designs were submitted by nearly all the Glasgow architects, and twice he was awarded the first place. The design was adopted by the committee, and in due course the fountain was erected in Kelvingrove Park, where it will remain as a memorial of the early age at which Mr. Sellars attained his power. In the course of his subsequent career he gave full evidence of the possession of all those qualities which go to make the successful architect. Quick to apprehend what was required by those by whom he was consulted, a draughtsman with few equals even in this age of good draughtsmanship, he had remarkable facility in placing his ideas on paper. In addition, he imbued all his work with his own individuality, and it is an open secret in the profession that every detail of every design which left his office was either drawn with his own hand or thoroughly revised by him before being put into execution. His judgment was almost unerring, and his clients never failed to find in him a sagacious and trustworthy adviser.

Mr. Sellars's power as an architect was seen to the greatest advantage in the various public buildings for which he supplied designs. Among these, probably the most important is the St. Andrew's Halls in this city. These designs were prepared before Mr. Sellars joined the firm of which he was subsequently the active partner, but his influence is very marked throughout the whole building. The new club in West George Street is another design in Mr. Sellars's best style. In the opinion of many well qualified to judge no building in Glasgow shows a more thorough mastery of detail; and this is the more remarkable when it is considered that at the time it was designed Mr. Sellars had not had the benefit of foreign travel, and that much of his professional education was self-acquired, the result of close application in comparatively adverse circumstances. The Belhaven United Presbyterian Church and the Hillhead Established Church rank among the most important of Mr. Sellars's Gothic buildings. They are excellent examples of different phases of this style of architecture, and with the buildings already mentioned—the one a Greek, the other a Renaissance design—illustrate the versatility of his genius. It is impossible to enumerate all the work which has been carried out under the direction of the firm of which Mr. Sellars was a partner. As showing how much he has had to do in recent years in giving character to the architecture of our city, the following may be mentioned, viz.:—The *Glasgow Herald* offices; the office of the Scottish Amicable Insurance Company, St. Vincent Place; the City of Glasgow Bank, Glassford Street (now occupied as a warehouse); Messrs. Wylie & Lochhead's warehouse in Buchanan Street; the Queen Insurance Office, St. George's Place; Finnieston, St. Enoch's, and Anderston Free Churches; the Kelvinside Academy; the Sick Children's Hospital and Sick Children's Dispensary; the Mossbank Industrial School; the Cooper Institute, Cathcart, and many others. In addition to all his other work, Mr. Sellars sent forward designs in all the competitions which have taken place in Glasgow during the past twenty years. His plans for the Municipal Buildings are well remembered, and many regarded them as among the best submitted. In everything having for its object the advancement of art and architecture Mr. Sellars took the warmest interest. For nine years he was a member of the Council of the Institute of Fine Arts, and he filled the presidential chair in the Glasgow Institute of Architects and the architectural section of the Philosophical Society, while he was honorary president of the Glasgow Architectural Association. A draughtsman of the first rank, he was thoroughly conversant with the practical details of his profession, and many of his addresses to these societies formed important contributions to the discussion of questions of sanitation and construction. Mr. Sellars was from its beginning a member of Belhaven U.P. Church, and at the time of his decease was preses of the congregation.

## TESSERÆ.

### Subjects for Decoration.

A. POYNTER.

IN the resources which the decorative artist can call to his aid, the moderns have greatly the advantage over the ancients, since we possess their materials and our own also. For as long as ancient authors are read and ancient art appreciated, so long will allusion to the manners, customs, poetry, and religion of antiquity be familiar to us, and the symbols to which they gave rise be universally understood; indeed numberless allusions of this kind are constantly before us, and are so familiar that we forget to inquire their origin. In personification, and the embodying of abstract ideas, the field is as open to us as to them, and we see to what advantage it may be turned by the examples we have just passed in review; and if we add to all these objects those derived from

the useful arts and sciences which may be turned to account in the hands of the skilful decorator, his resources may be considered boundless. For, as we have seen in these examples, it is not the familiar aspect of any object which should banish its representation from works of fancy. Everything depends upon its proper application. The ancients made the best use of whatever they considered most appropriate, and we must endeavour to do the same.

### National Taste.

R. REDGRAVE.

Taste, which is in accordance with the habits, inclinations, and general disposition of any people, may be national without being correct. It is with nations as with individuals, of whom we hear it said that one has a vulgar taste, another a refined taste, one a mean taste, another a taste for the beautiful or the magnificent. Thus in referring to the ancients, all who have had any knowledge of ancient art or literature would at once say that the Greeks as a people had a taste for the refined and the beautiful; in literature, always entering into the most subtle definitions and the nicest distinctions; and in art refining all they undertook with the most sensitive perception of what is perfect, never leaving a new creation until they had by continual effort arrived at the most beautiful form, proportion, and colour of which it was capable. The Romans, who succeeded to their art, were of a different character: grandeur and massiveness were the leading characteristics of their taste. Larger in mind than the Greeks, there was at the same time a coarse strength in their nature, and a barbaric grandeur, to which Greek art never attained, was the corresponding result. This was shown in the vast extent of their public buildings (such as the Baths of Titus and the Coliseum, compared with which the largest works of the Greeks would appear diminutive), in the coarse vigour and bold relief of their ornamentation, and the spherical curves of their mouldings.

### Amateur Artists.

W. JACKSON.

To attain excellence in the arts is the lot of very few professors, who have spent their lives in the pursuit. Gainsborough, after a close application to painting for fifty years, said on his death-bed, "I am but just beginning to do something, and my life is gone!" I could repeat expressions of architects, sculptors, and musicians, grown old in the study of their professions, to the same purpose, from whence we may conclude that the usual term of the duration of our faculties is not sufficient to attain that perfection to which genius aspires. This truth being admitted, for it cannot be denied, what shall we say to those peremptory judgments which are passed upon the works of genius by persons who never had, nor, perhaps, could have, a thought upon the subject? In any other case we should judge them rash and presumptuous. No man who is unacquainted with the common professions and trades ever pretends to know anything about them, but every man fancies he can be an architect, painter, or musician with simply saying, like the Elector of Brandenburg, "I will be a king!" Every one feels himself equal to the designing and building a house—very few who do not think they might, if they chose it, be painters—and what numbers of *dilettanti* are there who, because they possess ear, and perhaps a taste for music, fancy they can compose? Should these *soi-disant* artists exhibit proofs of their skill, it is natural to imagine that their impotent attempts would only be despised and make them ridiculous; just the reverse, their works are most favourably received. What they may possibly want in skill, say the public, they possess in taste, and a natural taste is everything.

### Ancient Sanitation.

G. WILSON.

Towns must have fearfully suffered before the inhabitants learnt that the houses must be so far separate as to allow air to blow between them. The Greeks must certainly have made their cities, and many of their streets, exceedingly handsome, but their earlier towns, and even Athens, were too much crowded; and so much did they fear jobbery among the sharp-eyed business men of the city, that they dared not trust anyone with money to rebuild the place. In Constantinople, Zeno ordered all houses to be 12 feet apart all the way up, and the projections which caused the houses nearly to meet above were disallowed. This was an effort, after a long interval of neglect. He attempted also to go farther, and ordered that no one should stop the view of the sea from his neighbour. This would be well in our sea-bathing towns, where houses are built before others without pity, and not only is the view destroyed, but the whole living of the families who possess it, and to whom the view paid the rent. But the laws are of no value unless a strong and vigilant executive attends to them. Constantinople became so bad that its destruction by fire was



scarcely deemed a misfortune. How infected by their own crowding the Romans must have been when the houses were ordered to be at least 5 feet apart, and not more than nine storeys high. Augustus said they should not exceed 70 feet in height, and Trajan made the limit 60. The laborious proofs that sewer air is unwholesome have taken commissions and boards of health many years of hard labour in our time, but the whole is as clearly recognised in Justinian's Digest, in quotations from Ulpian, that it is evident that the question was then past all dispute. The world is obliged occasionally to revive its principles. However true may be the opinion that man is always in progress, we cannot deny that he often makes, in certain places, wonderfully long steps backwards. Although Hippocrates is praised for his skill, shown in fumigating the streets by the smoke of fires and by perfumes, by shutting certain windows and opening others, one of our prominent men in the sixteenth century is found speaking with approval of killing "pigeons, cats, dogs, and other hot animals, which make continually a great transpiration or evaporation of spirits which issue forth of evaporation, the pestiferous atoms which are scattered in the air, and accompany it, used to stick to the feathers, skin, or fures." We, as a nation, have gone backwards and forwards as the ancients did, and in a generation we have many waves of opinion, because we do not learn sound principles, or if we learn, we do not teach them that they may be continued.

#### Pompeian Houses.

E. M. BARRY.

The walls of the dwellings are as a rule badly built, with ill-burnt bricks and rubble, and owe much of their stability to the plaster with which they are encased, and which is of good quality. Some of the surfaces, indeed, are so hard and fine that they bear a polish like scagliola, or our hardest cements. In such cases great care has been taken with the last or finishing coat, formed of sand, lime, and pounded marble. This was well rubbed down, and Vitruvius says the colours were laid on while it was wet, so that they became a part of the structure like the more modern fresco, which was incorporated with the plaster, instead of being a mere surface application like ordinary painting. The Roman floors were often very beautiful, as you may see from the specimens preserved in the museums of Europe, and particularly in the Louvre at Paris. They were made of cement, in which fragments of marble were set constituting mosaics. These existed in Pompeii in great variety, and some of the panels were very finely designed and executed. We have lately witnessed amongst ourselves a revival of this mode of constructing floors, the chief credit of which belongs, I believe, to the authorities at South Kensington. The doors of the Pompeian houses were of wood. They were consequently destroyed, but their form and character can be distinctly traced. They had no hinges, but revolved on pivots, and must have made much noise when they were opened or shut. The creaking of a door was not objected to, however, as it was considered a proper mode of announcing the approach of a visitor, and thus served the same purpose as the modern bell. Iron chains and bolts were used at night for securing the doors. It is known that there was glass in Pompeii, not only for domestic utensils, but also for use in windows. It was, however, rarely used, in consequence probably of its great cost. Some of the rooms in the public baths had glazed windows, and the glass was found in fragments when the building was first excavated. It is of good quality, and ground on one side to prevent persons outside from looking into the baths. In the museum at Naples there are great quantities of glass bottles and other vessels of the same material, all of which were found at Pompeii, and we may feel confident that so clever a people as the Romans were could not have employed glass for such purposes without perceiving its advantages for windows, when they wished to admit light while excluding the external air. Indeed, during the later times of the Roman Empire, there is reason to believe that the walls of the great public baths were lined with glass as well as marble, and even decorated with mirrors. In connection with this subject, it may be here stated that in addition to glass vessels, almost every conceivable household utensil has been found at Pompeii, and among them portable fireplaces, braziers, and contrivances for heating water. In the houses generally there are no fireplaces or other permanent arrangements for warming, and it is difficult for us to understand how the people can have lived in health or comfort in these slight dwellings, with their courts uncovered and exposed to the vicissitudes of the climate, although the climate of the South of Italy. The latter is, of course, very different from our own; but in winter time the modern Neapolitan is glad to welcome the comforts of fire and warmth, which in northern countries are more constant necessities. Moreover, the climate is far from unvarying; there is sometimes a great amount of cold, and I have myself seen a fog at Naples which would have stood comparison with one on the banks of the Thames.

#### Data for Strength of Stone.

G. R. BURNELL.

We do not possess any tables of the resistance of English building stones to crushing weights which can be considered to be perfectly satisfactory. All the experiments recorded, excepting the few mentioned in Mr. E. Clark's account of the Menai Tubular Bridge, have been made upon small cubes of at most 3 inches on the side. In practice, however, the resistances are singularly modified by the joints, and the interposition of mortar between the bearing surfaces; whilst Vicat's experiments upon small superposed cubes seem to indicate that the number of such horizontal joints considerably modifies the resistance of each of the cubes. Again, the results usually quoted of late years of the resistances of building materials have been obtained by the use of the hydraulic press, an instrument which is very likely to get out of order, and whose indications cannot easily be watched with the accuracy required in investigations of this delicate nature. Mr. Hodgkinson, in his experiments on iron, wood, and some kinds of stone, and M. Flachet in his observations upon the resistances of the Aubigny, Orival, Caen, and Ranville oolites, used a system of levers in the applications of the weights to those materials; and though unquestionably there is a probability of the weights being in such cases made to bear unequally upon the exposed surfaces, the danger is not greater than when the hydraulic press is used, while, on the other hand, it is far easier to apply the load by slight increments, and to watch its action during even a lengthened period. After all, the most valuable observations upon the resistance of building materials are those to be obtained from observation of the conditions of success and failure of actual constructions, such as Rondelet records in his "Traité de l'Art de Bâtir."

#### Thorwaldsen's "Mercury."

J. C. HARE.

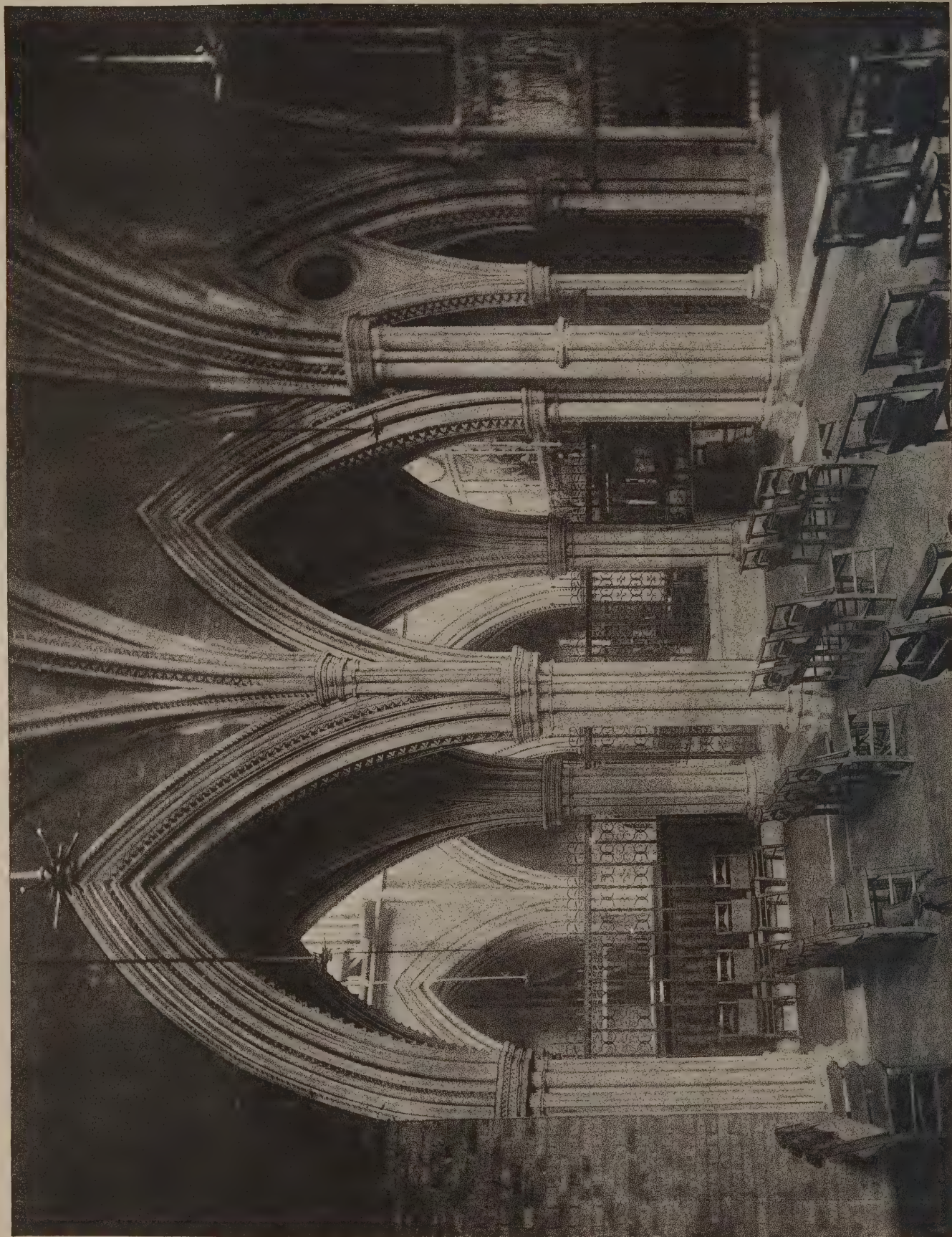
An illustrious friend of mine calling on Thorwaldsen, found him, as he said to me, in a glow—almost in a trance of creative energy. On his inquiring what had happened, "My friend, my dear friend," said the sculptor, "I have an idea, I have a work in my head, which will be worthy to live. A lad had been sitting to me some time as a model yesterday when I bade him rest a while. In so doing, he threw himself into an attitude which struck me very much. 'What a beautiful statue it would make!' I said to myself. 'But what would it do for? It would do exactly for Mercury drawing his sword, just after he has placed Argus to sleep.' I immediately began modelling. I worked all the evening till, at my usual hour, I went to bed. But my idea would not let me rest. I was forced to get up again. I struck a light, and worked at my model for three or four hours; after which I again went to bed. But again I could not rest: again I was forced to get up, and have been working ever since. Oh, my friend, if I can but execute my idea, it will be a glorious statue!" And a noble statue it is, although Thorwaldsen himself did not think that the execution came up to the idea. For I have heard of a remarkable speech of his made, some years after, to another friend, who found him one day in low spirits. Being asked whether anything had distressed him, he answered, "My genius is decaying." "What do you mean?" said the visitor. "Why, here is my statue of *Christ*: it is the only one of my works that I have ever felt satisfied with. Till now my idea has always been far beyond what I could execute. But it is no longer so. I shall never have a great idea again." The same, I believe, must have been the case with all men of true genius. While they who have nothing but talents may often be astonished at the effects they produce by putting things together which fit more aptly than they expected, a man of genius, who has had an idea of a whole in his mind, will feel that no outward mode of expressing that idea, whether by form or colours or words, is adequate to represent it. Thorwaldsen's *Mercury*, it appears, was suggested by a lad whom he had seen sitting at rest. But does that detract from the sculptor's genius? Every other man living might have seen the lad, and no statue of Mercury would have sprung out of the vision; even as millions upon millions before Newton had seen apples drop, without being led thereby to meditate on universal gravitation. So that, though genius does not wholly create its works out of nothing, its "mighty world" is not merely what it perceives, but what, as Wordsworth expresses it in his lines on the Wye, "it half creates."

Great Efforts are being made for repairing Seville Cathedral, the neglect of which recently resulted in serious damage. Monthly donations of 20*l.* each are being made by the Ayuntamiento, the Diputación, and the Cathedral Chapter, and the total subscriptions up to the middle of last month had amounted to 285,609 pesetas, or about 11,425*l.*









INK PHOTO. SPRAGUE & CO. 22, MARTIN LANE, CANNON ST. LONDON, E.C.

VIEW FROM CHAPEL, ST JOHN THE EVANGELIST, RED LION SQUARE.

JOHN J. PEARSON, R.A. Architect









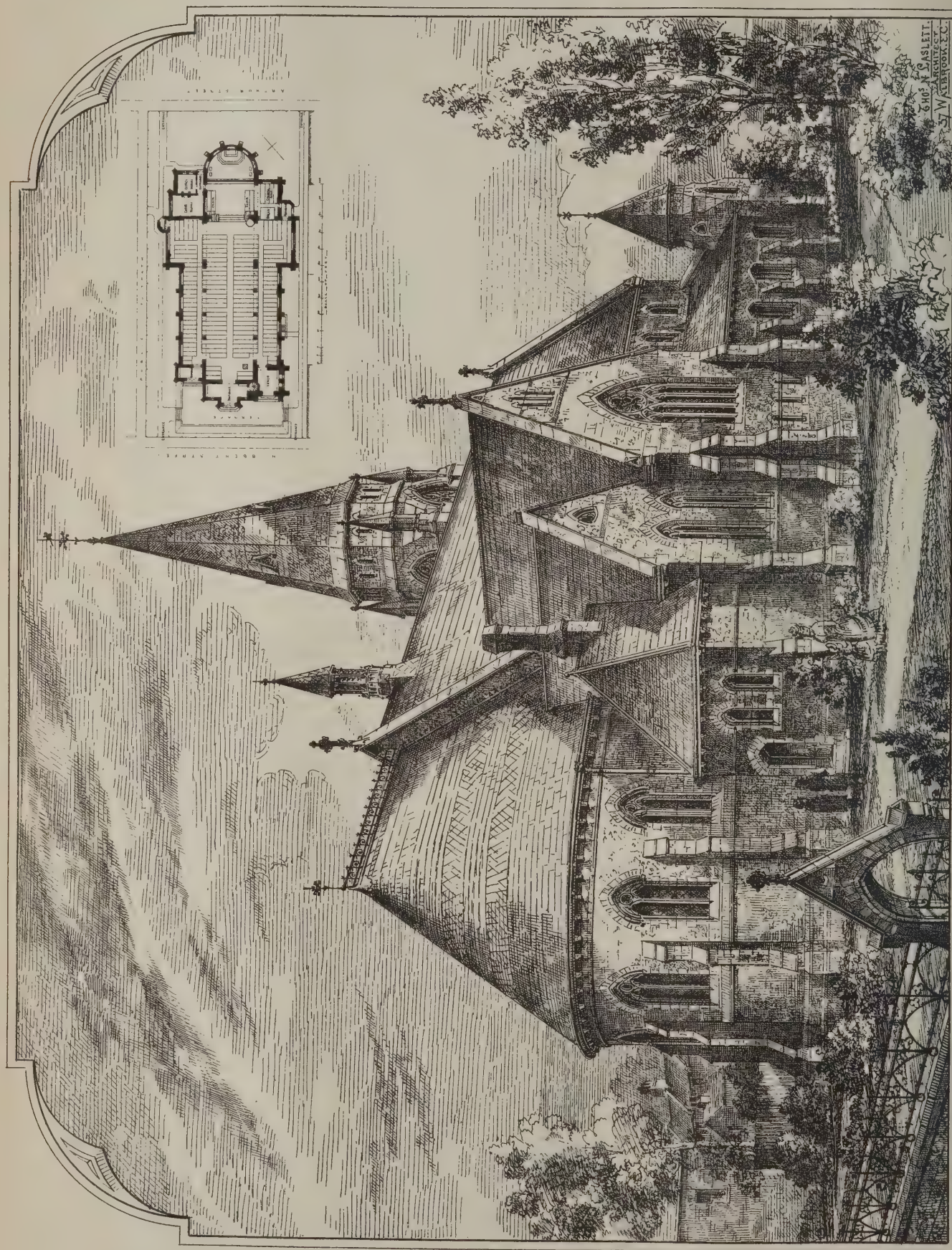
Printed by Spalding & Co. 22, Mark Lane, Cannon St. E.C.

KIRBY HALL.  
Drawn by HENRY DRURY.



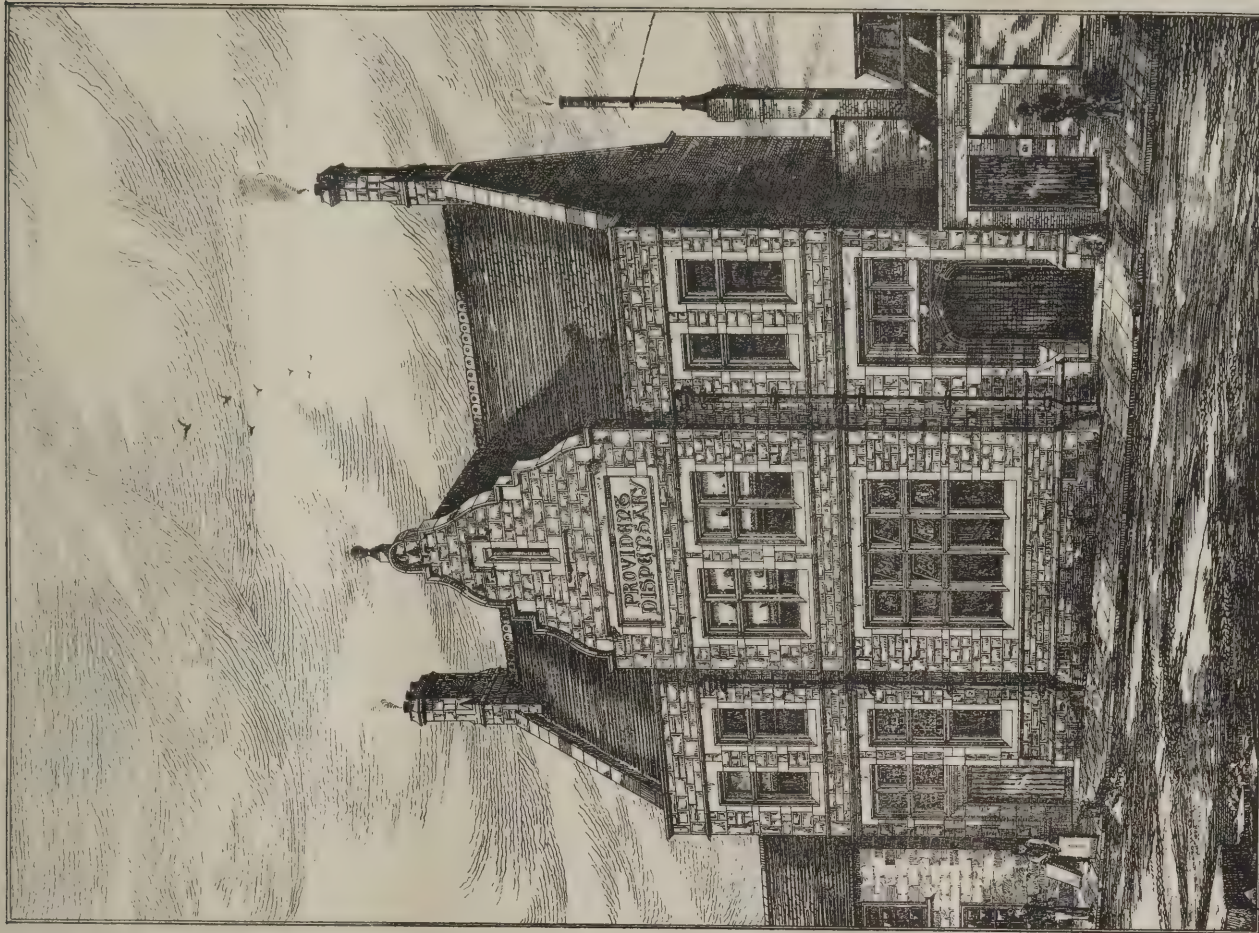




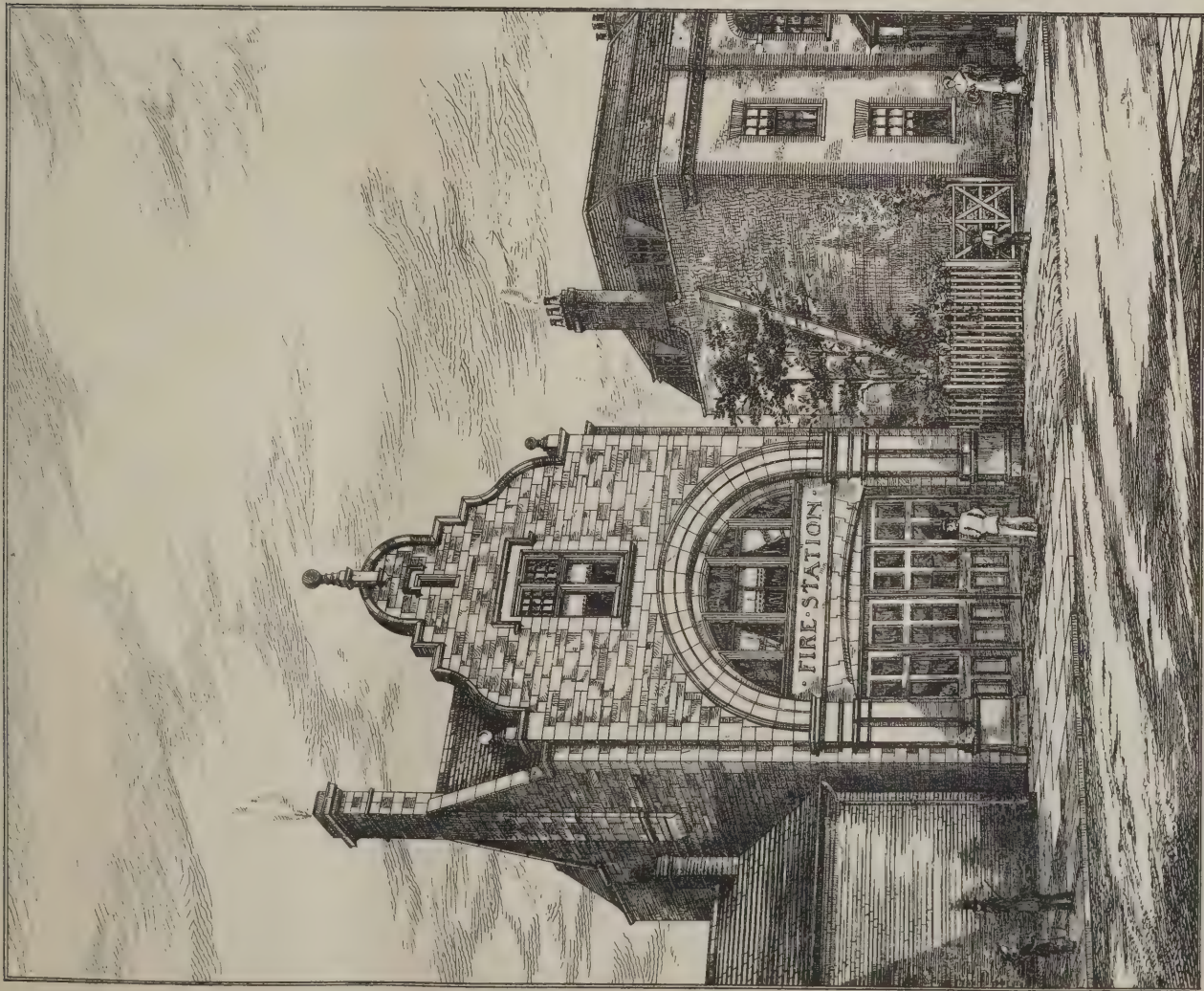


DISTRICT CHURCH OF ST. PAUL, LUTON.  
THOS N LASLETT, Architect





designed by Sprague & Co. 22 Market Lane Cannon St. E.C.

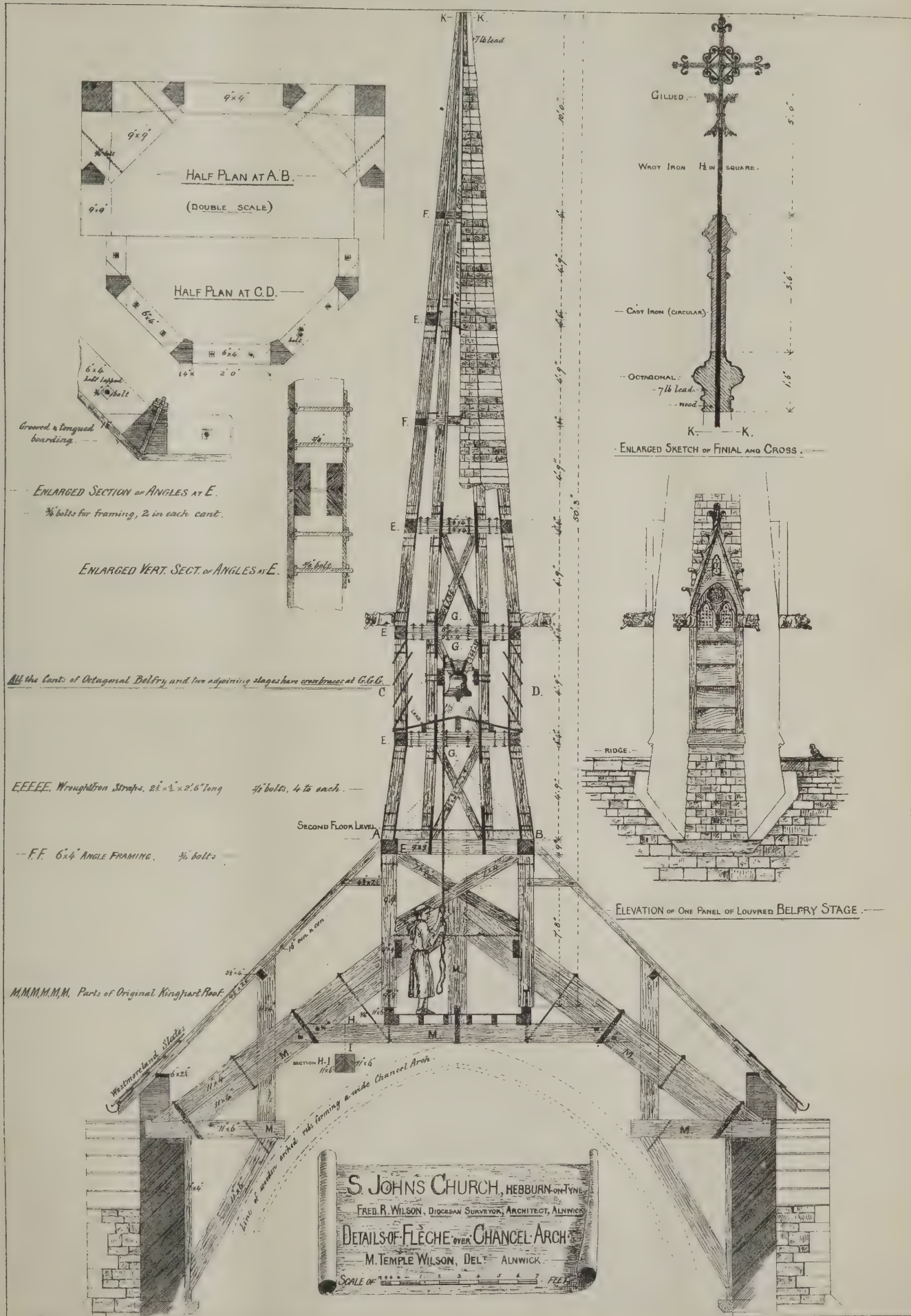


FIRE STATION & DISPENSARY, BEDFORD.  
MESS<sup>RS</sup> USHER & ANTHONY, Architects

















"INK-PHOTO" SPRAGUE & CO., 22, MARTINS LANE, CANNON ST., LONDON, E.C.

VIEW OF CHANCEL, ST JOHN THE EVANGELIST, RED LION SQUARE.

JOHN L. PEARSON, R.A. Architect







## ILLUSTRATIONS.

PROVIDENT DISPENSARY, BEDFORD.

THIS building was opened by the Marquess of TAVISTOCK on December 13, 1887, a short account of which appeared in our columns at the time.

The walls are faced with Lum's Hill stone (Derbyshire, Beck's Quarries), rock faced in random courses, with dressings of Monk's Park Bath stone, with cornices, labels, and copings in Ketton, the roof being covered with Broseley tiles.

The waiting-hall is 35 feet by 29 feet, the joiner's work being in pitch pine; floor solid wood block, by DUFFY & Co.; heating and ventilating by one of Messrs. MUGRAVE'S stoves. Communicating with the hall is the dispensary, consulting-rooms, and lavatory, and over this the dwelling-house for the dispenser.

The contractor was Mr. J. P. WHITE, of Bedford, and the designs and plans were by Messrs. USHER & ANTHONY, architects, Bedford.

FIRE STATION, BEDFORD.

THIS building, now in course of erection, was very much needed by the Volunteer Fire Brigade, in order to give proper accommodation for the valuable gift of a MERRYWEATHER steam fire-engine, presented by His Grace the Duke of BEDFORD to the Fire Brigade.

The external walls are constructed with Lum's Hill stone (T. BECK'S quarries, Matlock Bridge), the copings being of Ketton stone, and the roof covered with Broseley tiles. On ground floor is the engine-room, 22 feet 9 inches by 35 feet, with DUFFY'S solid wood-block floor, and in the rear is a covered-in yard for washing and cleaning engine in. On the first floor there is a large committee-room, together with lavatory and storeroom; and the second floor contains living-room, kitchen, and bedrooms for a resident fireman.

The station will be in telephonic communication with the principal buildings in the town.

The foundation-stones were laid on July 11 last by the Marquis of TAVISTOCK and Mr. S. WHITBREAD, M.P.

The contractor is Mr. GEORGE HARRISON, of Bedford, and the works are being carried out in accordance with the plans prepared by Messrs. USHER & ANTHONY, Architects, Bedford.

NEW DISTRICT CHURCH OF ST. PAUL, LUTON, BEDS.

THIS church, the plans for which have been prepared by Mr. THOMAS N. LASLETT, architect, of Walbrook House, E.C., having been for some years in contemplation, is now about to be commenced, the estimated cost, including the tower and spire, being 6,400*l.* It is much needed to meet the requirements of the growing district of New Town, Luton. The principal dimensions are as follow, viz., nave, 97 feet by 29 feet in the clear; chancel, 40 feet by 29 feet; aisles, each, 60 feet by 12 feet; transepts, each, 26 feet by 20 feet; chancel aisle, 20 feet by 12 feet; extreme length outside, 164 feet; ditto breadth, 87 feet. Owing to the position of the site the chancel will be to the south-west, next Arthur Street, and the tower and vestibules to the north-east, next Hibbert Street, where the principal entrances will be from a raised terrace. Separate vestries are provided for clergy and choir. The church (without galleries) is calculated to seat 900, besides 32 in the choir.

KIRBY HALL.

THE FLÛCHE AT ST. JOHN'S CHURCH, HEBBURN-UPON-TYNE.

IT will be remembered, from the description of this church given in our issue of June 22, that it has been converted out of a receding wing of Hebburn Hall, 148 feet long and 28 feet wide, which was generously presented by Mr. J. R. CARR-ELLISON, J.P., of Hedgeley and Dunston Hill, and designed by Mr. F. R. WILSON, diocesan surveyor, Alnwick.

The timber of the roof is of old red wood, in splendid condition, and the two couples supporting the flèche are constructed to utilise the previous king-post trusses. The centres of the tie-beams have been cut out, to admit the arched ribs forming a wide chancel arch, and raised and doubled to form collar-beams, and the principal rafters have

been strengthened with additional backs placed upon the tops. The tall octagonal flèche has been erected in stages, and securely strapped and bolted, and boarded to receive the 12-inch by 6-inch Welsh slates, mitred, and set in mastic, at the angles. A lead roof has been placed below the louvres to carry off drifting rains. The walls of the church are strengthened with massive buttresses at the sides to counteract thrusts. No part of the construction of the flèche is seen inside the church, as it is concealed above the wide chancel arch. The original roof was covered with sound Westmoreland slates, hung on laths with oak pegs. This was stripped and a false collar-beam roof raised about 7 feet above it, with a half pitch, to give more ecclesiastical effect to the building, and the same slates, nailed in the centre, with copper nails, placed on laths upon it. After the slates had been pointed, the under side of the spars of the outer roof were lathed and plastered with one rough coat, and the lower roof was boarded to form the ceiling of the church. A small model, for reference by the workmen, was made by Messrs. T. ROBERTSON & SONS, Alnwick. The sole contractor was Mr. JOHN MUNRO, Hebburn-upon-Tyne, and Mr. M. TEMPLE WILSON acted as resident architect.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 29.—VIEW FROM CHAPEL, ST. JOHN THE EVANGELIST, RED LION SQUARE.—[JOHN L. PEARSON, R.A.]

NO. 30.—VIEW OF CHANCEL, ST. JOHN THE EVANGELIST, RED LION SQUARE.—[JOHN L. PEARSON, R.A.]

## THE ARCHITECTURAL ASSOCIATION.

THE annual conversazione of this Association, held on Friday evening last at the Westminster Town Hall, drew a large attendance of members, accompanied by ladies. The president, Mr. H. D. Appleton, F.R.I.B.A., received the visitors in the large hall, where the band of the Royal Scots Guards, under the conductorship of Mr. Holland, during the evening gave selections from the musical programme arranged for the occasion. Musical entertainments were also given under the direction of Mr. J. Elwin, assisted by Madame Isabel George, Mr. Charles Chille, and Mr. Herbert Schartau, the instrumental department being sustained by Herr Polonaski on the violin, and by Miss Kate Cheyne and Mr. Herbert Schartau on the pianoforte. Between the parts the President announced the names of the members who had succeeded in carrying off prizes and honours.

The prize-list is as follows:—

- Architectural Association Travelling Studentship*, Mr. D. J. Blow; 2nd prize, Mr. R. D. Warry.  
*Aldwinckle Travelling Studentship*, Mr. H. V. Lanchester.  
*Architectural Association Medal and 10*l.* 10*s.**, Mr. B. F. Fletcher; hon. mention, Mr. E. L. Lutyens.  
*Essay Silver Medal and 10*l.* 10*s.**, Mr. H. Tooley; bronze medal and 5*l.* 5*s.*, Mr. W. Wonnacott; hon. mention, Mr. A. A. Cox.  
*Architectural Union Company's Prize*, Mr. S. Tugwell.  
*Cates Prize*, Mr. A. W. Hennings.  
*Ernest Turner Prize*, Mr. A. W. Jarvis.  
*Elementary Class of Design*.—Section I.: 1st prize, Mr. A. E. Habershon; 2nd, Mr. P. G. Eade; hon. mention, Mr. A. H. Saul and Mr. C. H. Strange. Section II.: 1st, Mr. A. W. Jarvis; 2nd, Mr. C. Bywater; hon. mention, Mr. R. A. J. Bidwell.  
*Elementary Class of Construction*: 1st, Mr. A. W. Cleaver; 2nd, Mr. F. H. Greenaway.  
*Elementary Class of Ornament and Colour Decoration*: 1st, Mr. C. S. Haywood; 2nd, Mr. V. T. Jones. Class prize, Mr. V. T. Jones.  
*Class of Design*: 1st, Mr. D. J. Blow; 2nd, Mr. C. O. King; hon. mention, Mr. J. E. Jefferson.  
*Class of Ornament and Colour Decoration*: 1st, Mr. H. V. Lanchester; hon. mention, Mr. C. J. L. C. de Beaupré. Time Sketch, Mr. C. J. L. C. de Beaupré.  
*Class of Construction*: 1st, Mr. O. Oertel; 2nd, Mr. H. Ernrick.  
*Advanced Class of Construction*: Mr. O. Fleming.  
*Quantity Class*: 1st prize, Mr. A. O. Breeds and Mr. G. Harvey equal.  
*Sketch-Book Prize* (title-page), Mr. W. G. B. Lewis.  
*Neale Prize*, Mr. S. Greenslade; hon. mention, Mr. H. Tooley and Mr. A. C. Walker.  
*Edis Prize*, Mr. A. Gladding.



*Lectures on History*: 1st prize, Mr. F. Elgood and Mr. O. Fleming equal; 3rd prize, Mr. E. Carless; hon. mention, Mr. W. Pywell and Mr. J. Gethin.

*Lectures on Construction*: 1st, Mr. F. R. Taylor; 2nd, Mr. A. C. Walker; 3rd, Mr. H. E. Mathews; hon. mention, Mr. E. Carless and Mr. L. J. Veit.

The prize drawings were exhibited in the rooms on the first floor of the building. There were also exhibited pencil and water-colour drawings by various members, including drawings by Messrs. Aston Webb, H. O. Cresswell, Walter Millard, Gerald Horsley, A. B. Mitchell, E. H. Selley, R. Phené Spiers, C. E. Mallows, A. H. Hart, and W. M. Duke.

The rooms were tastefully arranged and well lighted, the bright effect being heightened by the array of flowers. In the large hall were numerous exhibits of high-class objects from various firms. Messrs. Morris & Co., of London and Merton Abbey, were represented by wall-papers, hangings, and tapestries. Messrs. Jeffrey & Co., of Essex Street, Islington, by non-arsenical artistic wall-papers, among them being new decorations, including design by Mr. Lewis F. Day, with frieze 30 inches in depth, in which are introduced medallions representing the emblematic subjects of Earth, Air, Fire, and Water. The "Grotesque" design, in crimson and gold embossed leather paper, by the same artist. Panels of Persian ornament (a design by Mr. A. F. Brophy), suggested by the decoration in the palace of Taj Mahal; also the "Woodpecker" design, by Mr. Sydney G. Mawson; and a "Free Classic" decoration, by Mr. Hampden W. Pratt. Messrs. G. R. de Wilde & Co., late Newman & Co., by metalwork and ironwork. Messrs. Campbell, Smith & Co., of Newman Street, by schemes of decoration, &c., with a plan of the proposed decoration for the staircase at the Villa Selvosa at Cannes, for Mr. A. Ussher. Messrs. E. P. Turner & Son, Charlotte Street, Fitzroy Square, by art tile-paintings and designs. Messrs. Holland & Sons, Mount Street, W., by a massive cabinet of ornamental character of inlaid woods. Messrs. William de Morgan & Co., Great Marlborough Street, by ornamental tilework. Messrs. Carter & Aynsley, Bishopsgate Street Without, by staircase-work, balusters, &c., door furniture in wood and metal. Mr. H. C. Liley, Radnor Place, Hyde Park, by illustrations of ceiling decorations and decorations for dining-rooms, ball-rooms, &c. The Coalbrookdale Company by metalwork, worked fireplaces and furniture, also by statuettes and groups, figure and animal forms, &c. Messrs. George Wright & Co., Queen Victoria Street, by mantelpieces and overmantels of wood and of iron, and mirrors. Messrs. C. Hindley & Sons, Oxford Street, general fittings, carpets, rugs, &c., mantels, overmantels, and an exquisite ingle nook. Messrs. W. Walker & Son, Bunhill Row, by a massive carved wood chimney-piece and overmantel in Renaissance style, and handsome wood sideboard. Messrs. Longden & Co., Oxford Street, by grates, fenders, &c., fire-irons and furniture after old styles, mantelpieces and the like. Messrs. Montagu J. Scott & Co., by electric light and fittings; and last, but not least, Messrs. William Woollams & Co., by specimens of their well-known artistic and non-arsenical wall-papers and decorations.

#### THE MONUMENT.

AT the meeting of the Court of Common Council last week, Mr. H. H. Bridgman asked the chairman of the City Lands Committee whether he could give any information which would tend to reassure the public mind as to the safety of the Monument, and whether the cause of the recent fall of part of the stonework was in any way due to the construction of a subway within 50 yards of the base of the structure.

Mr. Frank Green said that every possible step had been taken to insure the safety not only of the Monument but— which was of greater importance—of the public. As soon as he heard of the accident he took upon himself the duty of giving instructions to close the Monument to the public during the period necessary for repairs, and also that steps should be taken at once to protect the public from accident by any further fall of masonry. He thought it very desirable that while they were about it they should avail themselves of the opportunity of thoroughly inspecting the stonework of the structure. Orders had been given to enable this to be done and to repair any portion of the stonework necessary. He thought the Court and the public should be assured that a most thorough investigation was being made into the cause of the accident, and that every effort would be made to obviate further danger. As to the accident being due to the construction of the neighbouring subway, that suggestion would be carefully looked into and measurements made. At present it was impossible for him to say whether the construction of the subway had anything to do with the accident, but he should think not.

Mr. Francis Chambers writes to the *Times* to correct statements which are contrary to his experience of the use of stone in London.

I have, he writes, in the course of years had, as architect, to superintend the repair of three of Wren's steeples, viz., Bow Church, St. Mary Aldermay, and St. James, Garlickhythe. In each case the stone is Portland, and the injuries to the stone were not due to atmospheric influence but to the use of wrought-iron cramps and dowels instead of copper or bronze. Several of the columns of the spire of Bow Church had to be taken out and reinstated, and in the case of St. Mary Aldermay, two of the pinnacles had to be rebuilt. The effect of oxidation gradually thickens the iron cramp—so much that some of the cramps taken out of St. Mary Aldermay had increased from  $\frac{3}{8}$ ths of an inch to  $\frac{3}{4}$  of an inch. The force exerted on the stone acts as a wedge and is irresistible; sooner or later the stone is fractured. I have not inspected the Monument, but it is probable the accident there arose from a similar cause. I believe Portland stone to be the best building stone for use in London; it is less affected by the atmosphere than any other. Where exposed, in south-west aspect, to driving rain it is dissolved or worn down very gradually and evenly, but it very rarely decays and crumbles away as do the Bath and Caen stones. In repairing the tower of Aldermay I noticed that a painter had in 1790 painted his name and the date on an exposed stone face with the thick red residuum of his paint pot. This paint surface had resisted the action of the drift rain, and when I saw it some twenty-five years ago, the surface of the letters was  $\frac{1}{8}$ th of an inch in advance of the stone like an engraved wood-block, thus giving a fairly accurate time measurement of the wearing away of Portland stone.

#### PROFESSOR HERKOMER ON PORTRAIT PAINTING.

ON Thursday evening last week Professor Herkomer delivered an address on art in the Philosophical Hall at Leeds.

The subject of art, he said, was much too large to deal with in one night, but he would take one phase of art which he thought would interest them most. It was a phase he had had some experience of, and he would tell them the truth about it. They were apt to blame the public for not knowing enough about art, and yet there were few who attempted to tell them anything about it. Artists were supposed to keep things to themselves. They really did not keep them to themselves, only they were sometimes very awkward in explaining in language what they would instinctively express with their brush. He would endeavour to take portrait painting as his subject. He considered portrait painting to be an art that was mostly looked at, mostly sought for in galleries, and yet least understood. People were satisfied if they recognised the person represented. That was all. It was a good likeness; you went no further; you cared no more, perhaps, for the future generations that were to buy portraits as the greatest works of art. Look where you would, you would find in the old masters their best qualities embodied in portraiture. You did not care very much for the man represented. He fortunately died; while time made the art, or the representation of the man, the thing to be remembered, so that portrait painting became historical painting in its truest and best sense. Painters in the present day were, of course, troubled with many things in regard to portraits. They were troubled with costumes. The more civilised we became the less picturesque we became. In the first place, this great art for immortalising us, as some one had wisely described it, could be divided into the artistic and into the mere likeness painting. In a portrait, of course, you should have the likeness of the person represented; but you wanted more than that. You must get into that one portrait, if possible, the most characteristic phases of that man's mind. This was a difficult and sometimes an impossible thing to do on one canvas; and as painters were not often permitted to paint two or three portraits of the same person—certainly not for payment—they could not always represent all they wanted in one picture. The likeness was only like the man if they got the mind.

Photography was curiously amiss there, but, still, had played so great a part in the modern phase of portraiture, that the work of painters was becoming doubly difficult. People might be sure that many of the portraits of Reynolds and Gainsborough had not always been striking likenesses. Indeed, he could not believe that all the eyes—the Chinese eyes—and the dainty, little red lips that Gainsborough invariably gave his women were true, and he could not believe either that all the portraits of Reynolds were correct likenesses. But every now and then there came an effort which showed everything that could be given. Photography had obliged modern artists to make as admirable a likeness as they possibly could; and, in addition, they were expected by judges—he did not say by the public—to give a great work of art. Consequently, they worked with two distinct motives. They worked for the public that wanted the portrait as a likeness, and they worked for the



future. In that way they were troubled perpetually, and no one there knew perhaps what agonies—real, heartfelt, bitter agonies—a portrait painter—aye, and the most successful portrait painter—went through in his yearly work, and when his pictures were finished he was fagged out in a way that no other painter could possibly be fagged out. He came to that condition when he cherished a hatred for art, for mankind, for anything that appertained to his profession; and, when his appetite for work returned, he found that he had been accumulating qualities that were entirely wrong, and probably that his first sitter was by no means made by nature as a receptacle for his own ideas. Again he found himself falling into his little rut, his painful mannerisms that had to be hauled out of his inner wickedness in order to get the work out of hand. Therein lay the kernel of disorder in the painter's life. He was struggling all the while to be honest. When he failed the public did not fail to blame him, although they little knew how and why the failure had come about. When success came to him, however, the joy was greater perhaps in the case of a portrait than of a subject, because the painter touched a human chord with his sitter that was never to be broken in after life. There were other moments when the work was nearly right and yet not quite right, and the artist did not know why it was not quite right. He was now speaking of successful portrait painters. When the painter found himself face to face with that difficulty, he, in his anxiety to keep prestige—poor souls, they were very anxious to keep prestige—defended what he knew was not right.

The public was easily scared. It was not on that ground that portrait painters sometimes started a portrait two, three, and four times, and then threw it away. The first difficulty was this—How much was to be a picture, and how much a mere portrait? The difference between subject painting and portrait painting was great. In a subject picture you never took nature as you found it, but rather endeavoured to mould nature to your own idea. But in portrait painting you had to sink your own identity as much as possible, and get at the identity of the sitter. It was not unmanly, possibly, of an artist to get sitters who always accorded with his own ideas, and there the commercial difficulty came in. If the portrait painter had a certain price for his work, then he had a certain set of people. If he raised the price until only a few could come, then he only got those who had money, and not necessarily those who had character. It was not always possible to be in sympathy with a sitter, and yet they would be surprised to find how much similarity there was between different temperaments once they got under the crust, as it were, of the habit of behaviour. In order to do this it was absolutely necessary for a portrait painter to be free from political or any other bias, and to be broad in his views on all subjects. Whatever character lay in a man, certain it was that that character was shown on his face to those who could read it. Nevertheless, they never could paint successfully the young man if he had done nothing. Beautiful women, too, they did not want to be anything else but beautiful on canvas, but a man must have done something, must have lived a strong life—then he was interesting. He did not think a painter could successfully paint a man he had no sympathy with, or a woman he could not admire. He had no business to paint the portraits of such individuals: if he attempted it he was no longer an honest painter.

In England especially there was great difficulty in getting to understand a man; indeed, there was no other way of getting into close contact with a sitter than that of dining with him two or three times. A man was really only like himself when he was animated. Sacred were, he knew, painters who said that there should be absolute repose in a sitter before he could be painted, and he knew an artist who depicted one of the greatest scholars of the age with a Bradshaw in his hand. In that way he obtained the dullest and the most painful expression possible. It was a clever dodge, but it was not just.

Rapidity of work was one very curious item in portrait painting. To be swift, meant to shirk a certain amount of finish which Reynolds and Gainsborough never dreamed of putting into pictures, although time had done it for them. They could not now get time to do for them what it had for the works of those masters. Time was the greatest artist, and could they only wait five years before they exhibited any work there would be better pictures in the exhibition, because one-half could not be exhibited, and the other half would have become more mellow. They could not make new paint look anything but new paint except by putting glass over it, which contributed something of the effect of old work. But glass could not be allowed in the Academy. Slowness as well as rapidity in working had its dangers. There were some portrait painters who had fifty sittings of two hours each, and to do that meant the wearying out of the sitter. To have five sittings, on the other hand, might for some painters be too few, and yet they would be surprised to hear that Millais's three *Gladstones*—the finest things he had done—were all painted in sittings of five hours apiece. Mr. Gladstone told

him that himself. This was a marvel to him, because the paintings contained not detail, but the suggestion of detail, which which was the greatest art of all.

There was one man whose loss they had now to deplore, and who was rapid in the right degree in his work; and in speaking on that subject he would like to pay a loving tribute to the memory of Frank Holl. To him England owed much of its stability in portraiture. He was always strong, manly, and artistic. He gave up his favourite subject in painting to paint human creatures with a skill and regularity of completeness for year after year which amazed them all. In that way he brought them all to shame every now and then. The most modest of men, he shrank from making comparisons about himself and his work, or from saying an unkind word to brother painters who were only anxious to get his criticism, however severe. There was no one to take the place and position in English portraiture which he gave up. Now it was scattered. Some of them would do work and do it willingly, but would be waiting for the strong man to come again and hold them together.

One other important question was the quality of work. He did not know whether the old masters were so troubled with what we call quality in painting. Just as all craftsmanship, all working in wood or iron was naturally artistic in those days, so their art was. On the other hand, there were a certain number of pot-boilers among the old masters. Quality had been introduced because of the miserable commercial question which had crept into art. Another great destroyer of art was fashion. It had done as much harm as anything else, and he did not think any of them were inclined to forgive Vandyke for painting, in accordance with fashion, those artificial hands which were seen in every one of his portraits. There were other portrait painters like Velasquez who painted perfectly honestly everything they saw, and nowadays he believed there was no fashion in portraiture. Art wandered from one phase to another in quick succession, so that the public was quite puzzled as to what it was and was not to like. He warned them against detailed backgrounds in portraiture and against subject pictures, and in conclusion stated that he could put his hand on ten young painters now who could not get on because they were not known. The public might get for 50% from those young men work for which they would have to pay another man 500%. That should be known. His observations that evening would, he hoped, lead them to take a greater interest in portraiture, because he thought a great portrait of a great and good man or a beautiful woman was the best gift a painter could give to mankind.

#### STOCKPORT SCHOOL OF ART.

THE opening of the Stockport School of Art took place on Thursday last week, Mr. Alfred Darbyshire presiding. In opening the proceedings, he said he had heard with regret that there was an impression in the minds of some people in Stockport and the neighbourhood that the institution which they were about to inaugurate might stand in rivalry with another munificent and magnificent institution which had just been erected in Stockport—he alluded to the Technical School. He might at once tell them that such a state of things could not possibly arise as a rivalry between the Art School at Stockport and the grand institution which they would hereafter know as the Technical School. The Technical School would send out its scientists, its mechanics, and possibly and probably its artists, but that Art School was intended to occupy a very much smaller field of action. While doing so it aimed at the highest objects of art. It hoped to send forth into the world painters and sculptors, and possibly architects. He ventured to predict that future generations of the burghers of Stockport would render their thanks to the munificent and noble men who had started the Technical School, and he thought also that in a future time they would look back with pleasure to that evening as inaugurating a period in that town which sent forth into the world painters and sculptors. Pointing to the two great art epochs—the Greek period and the period of the Renaissance—he showed that those great periods of art were entirely owing to one grand thing—an absolute mastery of the human figure. A man or woman who could draw the human figure perfectly could do anything in art, and if students did not master the human figure they would regret it all their lives. In that school they would be taught by clever men who do their best to enable them to do certain things, but they must never forget that the keystone of the arch was the two magic words “truth and beauty.”

Mr. J. H. E. Partington, speaking on the subject of “Art Education, Ancient and Modern,” remarked that the advance of public interest in England in matters pertaining to the higher education of the people had of late years manifested itself in an unmistakable fashion. In no previous period of English history had there been such a marked and imperative



demand for a wider, a sounder, a more thorough culture of all classes of the community in science, in art, and in letters. Mechanics' institutions, South Kensington departments, art galleries, free libraries, technical schools are springing up on every hand; vigorous efforts were being made by all sorts and conditions of men to spread the influence of these establishments broadcast over the land; and older institutions, limping along on worm-eaten crutches, fashioned for them, it might be, hundreds of years ago, had the alternative sharply thrust upon them either to fall into step with the irresistible march of public progress or to be shouldered to the wall out of the way of the onward rush. We were rushing onward, but whither? Were we quite certain that the track we were pursuing with the indomitable energy characteristic of the race would bring us to the goal we had set our hearts on attaining? With impatient discontent—a discontent which had its origin in the noblest impulses of our nature—we were saying, "Our fathers have misled us. The pale and ineffectual fires with which they lighted their dim and doubtful way towards power and happiness, towards the victory of man over nature, towards art, science, literature, and political wisdom, have gone out for ever in the full burst of sunlight which since their days has risen upon the world. No longer will we walk in leading strings. We must break their bands asunder and cast away their cords from us. The old order changeth and giveth place to the new." He had a great deal of sympathy with that way of looking at things. But he was inclined to doubt whether in all matters of human activity the methods and performance of our fathers were of such an inferior and inadequate character in comparison with modern efforts and systems as our enthusiastic progressists would have us believe. He particularly wanted to know whether in the great department of art education we had so completely demonstrated the fallacy and futility of the old methods of teaching that we were justified in replacing them by a system centralised under the authority of a Government department. Certain awkward facts, which were quite indisputable, met the believers in their modern superiority at the very commencement of the inquiry. In the six hundred years before Christ there was a splendid development of the sculptor's art which had since had no parallel. The statues which were produced during this period have been at once the admiration and the despair of all succeeding schools, and it is quite certain that no sculpture of the nineteenth century could compare with them for a moment. Most of the casts which they have selected for the School of Art, and which they saw around them, had been chosen because their originals belong to that golden age of sculpture. Without desiring for a moment to utter even a hint of disrespect for our eminent modern sculptors, truth and candour compelled him to admit that posterity was unlikely to place reproductions of their works in schools of art as types of highest beauty to form the taste of future generations of students. But not alone in sculpture had the progress of art been in a backward direction. In painting, also, better work had been done by generations long since dead than by any school of painters now existing. Proceeding, Mr. Partington gave an interesting sketch of the Mediæval and Renaissance art periods, and contrasted the work of the artists of those epochs with that of painters of the present day. Among a crowd of geniuses, he mentioned for the purposes of argument the names of Titian, Tintoretto, and Paul Veronese, whose work, he said, was of such towering and indisputable superiority over all modern artistic production, that there seemed a touch of cruelty to our contemporary artists in the bare suggestion of a comparison. How was it that our fathers hundreds of years ago were able to do better work than any sculptor or painter who had lived since their time? Dealing with the question in a general way, he believed that neither in mental, moral, or bodily fibre had there been the smallest deterioration, taking the race as a whole. If, then, the answer was not to be found in the dwindling powers of the race, could it be to the meanness of our artistic demands and the falsity of our methods of artistic training? We must not look for a solution of the problem. There could be no doubt it lay with one or the other, or in both, of these causes. Describing the system of art training which prevailed in the early periods, he said a lad was then taught his trade as a painter in the same way that the old workmen of England were taught theirs; a master of his craft took him in hand, and showed him by actual work done before his eyes the methods of that trade, with what result we knew. Since the days of Rubens and Vandyke we had changed all that, and had come to think that the art could be picked up by the haphazard efforts of the student himself, if he was occasionally assisted by the oral direction of a gentleman holding a certificate from South Kensington. We had systematised and centralised our national art education, and the estimates for last year figured up to 438,558*l.*, and what did we get for it? A lad learned to paint by seeing the master paint, and not by being told how to do it by a gentleman who might or might not know his business. That kind of teaching which he advocated was absolutely antagonistic to the South Kensington methods,

and was a kind of teaching with which the Department had no sympathy whatever. The men who could paint, and teach others to paint, were not the men who held certificates as drawing masters from South Kensington. In that Stockport School of Art they would follow, as far as their abilities and opportunities would allow, the methods of the men who trained artists to be great before the South Kensington system was ever thought of.

#### PATRONAGE OF ART.

AT the opening of the Fine Art Gallery, Leeds, last week, which has been built from the designs of Mr. W. H. Thorp, Professor Herkomer delivered an address, in the course of which he said:—You all, I am sure, have a right to consider this a very important occasion. I can speak for painters—that they, too, consider it a very important occasion. I deplore the fact that I alone represent my London comrades. I think if they could have seen your new institution, and felt the influence of a little of the spirit which has brought it about, they certainly would have come. From a painter's point of view the whole thing may look very different, and, without occupying your time very long, I may just give you one or two of the ideas that have struck me whilst looking on. We painters are very much handicapped at the present time by a want of elasticity in the houses of private collectors. Their walls don't expand, and they have long ago filled them. Few painters—I think none—care to keep all the pictures they paint. It annoys them to see their pictures remaining constantly in their studios. Believe me that it is not the best work that always sells the most readily—the imaginative work, the work into which the painter has thrown his whole soul, which is less understood. These galleries should be receptacles of great imaginative works—works that are not pretty merely and pleasant to look at; let them be as tragic as you like, they will appeal to great masses of the people who could not see them in private collections. You see I lay much greater stress on your future collection than on your present loan collection. In England we are gradually forming in different great towns collections of pictures—I don't mean pictures that cannot be sold, but imaginative works. We have in the Royal Academy a fund essentially devoted to buying works that are of that character. Well, here you have almost a clear beginning; and I shall shock you, I have no doubt, when I say beware of gifts. Beware, above all things, of the old masters. These are the things that first creep into a gallery of this kind. What I preach is that you should have great work, great for its artistic qualities. Every phase of artistic work should be represented in such a gallery as this, and, believe me, such work can be represented in a very small canvas that has perhaps taken the painter only two hours to do. I will also suggest that you should get a large fund for the purpose of buying pictures. This building, I am told, has cost you nothing, and with such resources you can also get pictures, and before you have the funds quite in hand you should ask the first-rate painters to give you pictures. They will do so, I am sure, if you ask them in a nice way. There are many pictures—studies and sketches which they have used up in their other works—and what would be more interesting to the public, certainly to the working men, than to see how pictures are made? If you cannot get the larger work, get an engraving of it; and the studies you can get for nothing. Be very cautious in collecting; but not so cautious as to prevent you getting a few things to start with. I congratulate you with all my heart, and I believe the painters speak with me in that; and I am sure great things will be attained by you in art as have already been attained in matters of music.

#### OUTLAY ON THE GLASGOW EXHIBITION BUILDINGS.

AT a meeting of the Executive Council of the Glasgow Exhibition, held last Friday, Sir James King, Lord Provost, presiding, the statement of cost of the Exhibition buildings prepared by the architects and measurers, and submitted by the Buildings and Grounds Committee, was adopted.

Bailie Shearer expressed the regret which he was sure all of the members felt at the absence of Mr. Sellars through severe illness. He said it must be matter of congratulation to the executive and all concerned that, as far as the buildings were concerned, the excess of cost over the estimate was only  $7\frac{1}{2}$  per cent., or 5,333*l.* It was true that to that there had to be added sums for work which had been ordered since April, and which had not been included in the estimate of cost which was placed before the executive by Mr. Sellars. These sums, however, were apart from the main building, and included items such as the ceremonial arch, grand stands, barricades, the working dairy, and general jobbing. It was agreed that the closing day, as far as admission by payment is concerned, should be Saturday, November 10, but that the Exhibition



should be open on Monday, November 12, to members of the executive, guarantors, and their friends. It was stated that a concert would likely take place in the afternoon, and an address be delivered, probably by Sir Archibald Campbell, Bart., and the Exhibition declared closed.

The statement is as follows:—

	Estimated by Architects.	Final Cost.
Main building and machinery annexes, including special floors for the latter, granolithic pavement, steps, &c. . . . .	£ 43,600	£ 48,165
Foundations of main building and machinery annexe, deep digger work and rock cutting, machinery foundations, deep drains, steam pipe culverts, water-tank, &c. . . . .	5,973	6,025
Boiler-house, boiler-seats, and chimney-stalk . . . . .	2,300	2,286
Outside buildings connected with main building, such as stores, goods offices, Indians' houses, fire-engine and police-stations, &c. . . . .	825	976
Sundry offices, lavatories, linings and fittings in courts (Women's Industries, Artisans', and French Courts), fitting up bank and post office, police and admission offices, female attendants' room, &c. . . . .	1,800	1,829
Painting and decoration, upholstery, flags, &c. . . . .	2,500	2,328
Buildings in grounds—dining-rooms, tea-rooms, kiosks, drainage of grounds, &c. . . . .	6,000	5,974
Bishop's Castle . . . . .	1,800	2,035
New bridge . . . . .	1,200	1,202
Deepening of Kelvin . . . . .	830	1,121
Laying off grounds, formation of roads, cost of blaise and gravel, enclosure fences, gates, &c. . . . .	2,300	2,020
Total cost . . . . .	£69,128	£74,461

In the last item, the cost of laying off grounds, blaise and gravel, as executed by the gardeners, under the direction of the Building Committee, is not included, as the work was not contracted for nor measured, but was paid from time to time by the executive as it was executed.

The excess of cost over estimate is, therefore, 5,333*l.*, or about 7½ per cent.

To the foregoing, however, there falls to be added work ordered since April, and not included in the probable estimate of that date, as follows:—

	£	s.	d.
Ceremonial arch . . . . .	454	13	1
Grand stands, enclosures, railround track, &c., at recreation grounds . . . . .	1,833	8	4
Pedestal under the Queen's statue . . . . .	20	18	6
Landing-stages on Kelvin and rustic stairs . . . . .	124	15	4
Barricades . . . . .	27	19	3
Platform for fire-engine at bridge . . . . .	40	9	0
Bank Street entrance . . . . .	176	19	4
Renewal of flags . . . . .	76	7	0
Painting of fittings in courts for executive . . . . .	214	4	5
Balconies and other work at towers . . . . .	659	18	8
Enclosing main posts, pedestals under two statues, and work at fountain in main avenue . . . . .	223	18	0
Ventilating shafts at dining-rooms . . . . .	130	9	2
Fittings in Indian courts . . . . .	577	5	6
Fittings in educational court . . . . .	78	1	0
Work for Allotment Committee . . . . .	36	10	0
„ Advertisement Committee . . . . .	24	15	4
Removing and fitting up Chubb's strong room for fireproof doors . . . . .	63	1	0
Fittings in picture galleries . . . . .	50	10	7
„ machinery annexe . . . . .	241	4	0
Roads to boilers and goods yard, &c. . . . .	67	9	0
Railway and barricades . . . . .	46	7	1
Jobbings at Bishop's Castle . . . . .	123	7	8
„ Museum . . . . .	74	19	0
„ Bridges . . . . .	76	2	3
Fittings in executive office, Grey Street, and goods offices, &c. . . . .	174	8	5
Sundries for recreation grounds and sports . . . . .	120	12	6
General jobbings by bricklayers, joiners, and plumbers . . . . .	1,074	2	11
Engineers' office . . . . .	83	2	0
Cleaners' room . . . . .	49	8	8
Doulton's store . . . . .	32	6	2
Workmen's latrines and closets . . . . .	31	17	6
Gateways and hoarding next Dumbarton Road . . . . .	386	12	9
Stores next Dumbarton Road . . . . .	75	7	7
Outside lavatory at fire-engine station . . . . .	101	6	11
Indians' lavatory . . . . .	5	0	6
Urinal west of Indian Section . . . . .	15	15	9
Lavatory east of annexe . . . . .	65	6	4
Working dairy . . . . .	379	12	3
Band stand, south side . . . . .	214	5	11
	£8,253	8	8

The above sum of 8,253*l.*, added to the previous total of 74,461*l.*, makes a total of 82,714*l.*

#### MANCHESTER FINE ARTS ACADEMY.

THE annual address to the students of the life class in this institution was given by the president, Mr. R. Crozier, on Tuesday evening. As regards methods of instruction in art, opinions, in recent years especially, he said, have been very diverse, and yet it is admitted that a great advance has been made in English art—an advance no doubt due in a great measure to a more extended knowledge of the human figure. It is well known that of old art required an acquaintance with all matters coming within the range of its needs. Superficial knowledge did not then command respect for those votaries who were content to dabble in the shallows of art, unmindful of the more laudable ambition to execute work that would leave a mark upon the school or period in which it was produced. Drawing, or the power of expressing form truthfully, is undoubtedly the basis of all art work, although weakness or lack of knowledge in this respect may be to some slight extent compensated for by special beauty of colour or unusual skill in light and shade. The old masters must have devoted much time and trouble to gaining that proficiency which marks the accurate knowledge so evident in their work. Geometry, perspective, and human anatomy, with continued observance of the passions and emotions of the mind, all came within the range of their study; in short, they were unweariedly assiduous in their researches into everything that could add to their instruction or advancement in art. In studying from the model we cannot observe with too much accuracy. Exactness imparts understanding, and by it strength of hand is acquired and the true characteristics expressed. I cannot do better than repeat what I have previously laid stress upon, that in your study of the figure you will do well to consider the general structure as based on the skeleton and muscular development, and also the design as emanating from varied action. The simple principles of light and shade, if well understood, will lead you to the right rendering of parts, whilst a true observance of the general shapes and masses will give evidence of your individual appreciation and feeling.

#### GLASGOW ARCHITECTURAL ASSOCIATION.

AT the monthly meeting of this Association held last week, two short papers were read, the first by Mr. A. W. Beaton, on "Wrought Ironwork," in which a review was given of the history of this artistic as well as useful craft, which reached its highest development in mail armour. Ecclesiastic metalwork came next in importance, domestic examples of equal age being naturally somewhat scarce. Until but recently Glasgow possessed almost no example, but now the blacksmith's art was well represented, in the form of gates at least, in the Municipal Buildings, Commercial Bank, and Central Station. Numerous drawings and specimens of ironwork, lent by Mr. Adam, smith, were exhibited. The second paper was on "Church Organs," by Mr. Larment D. Penman. The disposition of the internal arrangement, as dictated by constructional and acoustic requirements, was first considered, and the too common error of packing into a small recess noted. The materials themselves, both metal and wood, were next described, and finally the organ as an architectural adjunct in form and decoration was discussed. Brief discussions followed the reading of the papers, and their authors were awarded the thanks of the meeting.

#### SANITARY WORK IN LEEDS.

THE annual report of the Sanitary Committee of the Leeds Corporation just issued states that overcrowding cannot be said to exist in Leeds to such an extent as in some other towns. Only 256 overcrowded houses have come under the notice of the health officer. In each instance notice was served upon the occupiers, and the notices have been complied with. During the year special attention has been paid to the habitations of the poor. The committee have been zealous in their efforts to abolish houses in such a state as to be unfit for habitation, or to have such as could be improved so repaired as to render them habitable. Upon the certificate of the medical officer of health, 76 houses have been closed, and most of them were pulled down, as there seemed no possibility of putting them into a habitable state. The number of other dwelling-houses repaired was 44. There are 80 lodging-houses on the list at present; 15 have been struck off the register as not complying with the regulations; and 640 visits have been paid to these houses. The number of drains inspected was 35,408, and 6,815 were found defective; 1,185 were tested by the assistant inspectors, and of that number 927 were found defective. Drains connected directly with the houses, all of which have been completely disconnected, amounted to 2,841, and drains relaid 1,637. These works were all in respect of old drains, but new ones have been laid to the number of 5,163.





#### Architectural Competitions.

SIR,—Will you allow us to state through your journal that we are now preparing a revised list of those architects who have signed an agreement not to take part in any public architectural competition unless one or more professional assessors are appointed to advise the promoters, and that we shall be glad to receive the signature of those architects who have recently started in practice, or have not yet signed the undertaking, and shall be pleased on application to send them the usual printed form.

The revised list will show a very considerable increase in the adherents, in spite of the inevitable loss by death and resignation, and there can be no doubt that a large measure of reform has already been the result of the efforts made to obtain, wherever possible, the appointment of a professional referee.—We are, your obedient servants,

COLE A. ADAMS, } Hon. Secs. of the R.I.B.A.  
ASTON WEBB. } Competitions Committee.  
9 Conduit Street, Hanover Square:  
October 10, 1888.

#### CHURCH BUILDING AND RESTORATION.

**Crowthorne.**—The dedication-stone of a new chancel to Crowthorne parish church has been laid. The contract for the work was taken by Mr. Parmenter, of Braintree, at 1,437 $\frac{1}{2}$ l. Mr. John Grundy, of London and Tyldesley, has carried out the heating on his hot-air system. The architect is Mr. A. W. Blomfield, A.R.A.

**Liverpool.**—The Catholic church of St. Anne, Edgehill, has been reopened after improvements, which included the lengthening of the nave, two new transepts, chancel, three side chapels, and sacristies. The plan of church as completed is in the form of a Latin cross, and the crossing is formed by four stone arches, one forming the chancel arch. The architect of the original structure was Mr. Charles Hansom, and the new work has been designed and executed under the immediate superintendence of Messrs. Pugin & Pugin, of Westminster. The works have been carried out by Mr. Thomas Urmsom, of Liverpool. Mr. M. Shamley acted as clerk of works.

#### SCHOOL BUILDINGS.

**Exeter.**—The foundation-stone of the new Middle School for Girls, which is to be erected in connection with the Exeter Episcopal Schools' Trust at Pennsylvania, to take the place of the premises at the old Post-office in Queen Street, which are now used for the purposes of the school, has been laid. The architect is Mr. James German, F.R.I.B.A., and Mr. William Gibson is the builder.

**Laverstock.**—A new day-school has just been opened. The buildings, which are designed to serve the purposes of a mixed school, are of red brick in late Gothic style, with large mullioned windows, four centred arches, and relieved by moulded brick labels, strings, and piercings, and wrought and chamfered barge rafters, with moulded ends to timber, and steep roofs covered with slates with moulded finials at the gables, the front gable being further enriched with a bell-cot projecting boldly from the wall and supported upon moulded stone corbels with date panel between same. The wrought-iron weather-tight casements were provided by Messrs. Burt & Potts, of London. The works have been carried out by Mr. H. J. Kite, of Fisherton, Salisbury, from the drawings and under the personal supervision of Mr. Fred Bath, F.R.I.B.A., architect, Salisbury, Mr. C. Adey and Mr. A. Rogers, both of Fisherton, Salisbury, executing respectively the stonework and the ornamental wrought-ironwork.

#### NEW BUILDINGS.

**Northampton.**—The corner-stone of parochial buildings for the parish of St. Giles has been laid. The buildings, which have been designed by Mr. S. J. Newman, architect, of Abington Street, Northampton, are being erected by Mr. J. B. Clark, builder, also of Northampton. The buildings are designed in Queen Anne style, and will cost about 2,800 $\frac{1}{2}$ l.

**Newcastle-on-Tyne.**—On Monday afternoon the foundation-stone of a new block in connection with the Whitley Northumberland Village Homes, Newcastle, was laid by the Countess of Ravensworth. The cost of the building will be about 2,000 $\frac{1}{2}$ l. Messrs. Oliver & Leeson, of Newcastle, are the architects.

#### GENERAL.

**Mr. T. C. Horsfall** will give a lecture on "Art in Education" during the present session of the Manchester branch of the Teachers' Guild at Owens College.

**Mr. Reckitt, J.P.**, Hull, has intimated his intention of building and establishing a free library for the eastern portion of the borough. The cost of the building, books, and endowments will amount to about 10,000 $\frac{1}{2}$ l.

**Mr. Charles Lynam**, of Stoke-on-Trent, has made an application for the county surveyorship of Staffordshire.

**M. Deperthes**, one of the architects of the Hôtel de Ville, Paris, has gained a second prize of 5,000 francs in the competition for the façade of Milan Cathedral.

**Colonel North**, of Eltham, Kent, who recently gave 5,000 $\frac{1}{2}$ l. towards the extension of the Leeds Infirmary, has contributed 1,000 guineas in support of the engineering department of Yorkshire College, in that town.

The "Tablet" says the Holy Father has been pleased to confer on Mr. Peter Paul Pugin the honour of a Knight of the Order of St. Sylvester.

The First Annual Exhibition in connection with the Yorkshire Union of Artists in Bradford will be held next month, and the sanction of the Free Library Committee of the Bradford Corporation has been obtained for the use of the Museum and Art Gallery in Darley Street for the purpose.

The Report of the Commissioner of Police of the metropolis for 1887 states that, since 1849 there have been built 500,852 new houses, while 3,463 are in course of erection, 1,833 miles of new streets have been added to the charge of the police, and the population has increased from 2,473,758 to 5,476,447.

At the Meeting of the Glasgow Exhibition Fine Arts Committee on Thursday last week, it was reported, in connection with the damage which was done to Mr. T. G. Arthur's picture *Les Danses des Nymphes*, by the rain in June last, that 500 $\frac{1}{2}$ l. had been recovered from the insurance offices.

"The Parliament House of Owen Glendower was," Sir P. Pryce Jones writes, "so long ago as 1881 doomed to demolition, and a proposal to acquire it for a local museum having been abandoned through lack of funds, I despatched an agent to Dolgelley with instructions to purchase the materials at any cost. These, having first been carefully marked, were removed to my residence at Dolerw, near Newtown, in the grounds of which they were re-erected some two years ago, under the superintendence of Mr. David Walker, architect, of Liverpool; and here I trust they may long remain a memorial of the past history of the Principality."

A Meeting of the Royal Commission appointed to inquire into the Metropolitan Board of Works affairs held a meeting last Friday, when the draft of the interim report was submitted for discussion.

The "Leeds Mercury," speaking of the Corporation Art Gallery on its being thrown open to the public, says among the visitors was Mr. Agnew, of Manchester, who was very liberal in flattering references to the Gallery, and went so far as to intimate that, had his firm been at all acquainted with the character of the accommodation provided, they would, despite the worth of the pictures lent by them for exhibition, have been pleased to have sent a more choice collection. Much interest was evinced in the small work presented to the Gallery by Professor Herkomer. The picture, which is in water-colour, has for its subject *The Road-Mender Receiving the Village News*.

The Eighth Annual Exhibition of the Dundee Art Club was opened on Tuesday evening. The rooms have been lately rearranged and newly decorated.

The School of Art Wood-carving, City and Guilds Institute, Exhibition Road, South Kensington, has been reopened after the usual summer vacation, and we are requested to state that one or two of the free studentships in the evening classes, maintained by means of funds granted to the school by the Institute, are vacant. To bring the benefits of the school within the reach of artisans, a remission of half-fees for the evening class is made to artisan students connected with the wood-carving trade. Forms of application for the free studentships, and any further particulars relating to the school, may be obtained from the manager.

Mr. E. E. Shortland, of Manchester and London, has just supplied his patent Manchester grates to the Isolation Hospital, Carr Gate, Lofthouse, Mr. W. Watson, of Wakefield, being the architect.

CRIMINAL PROCEEDINGS, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, OCTOBER 12, 1888.

## EDITORIAL NOTICES.

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS ETC.

\* \* *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.*

*Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."*

## CONTRACTS OPEN.

ASHTON-UNDER-LYNE.—For Building Two Cottages. Messrs. J. Eaton & Sons, Architects, Ashton-under-Lyne.

BACUP.—Oct. 15.—For Pulling Down and Rebuilding River Wall between Hammerton Street Bridge and Irwell Inn. Mr. Wilson, Borough Surveyor.

BELFAST.—Oct. 22.—For Construction of Lock for the Lagan Navigation Company. Messrs. S. & W. H. Stephens, 41 Donegal Place, Belfast.

BENTLEY.—Oct. 15.\*—For Building Board School for Infants. Mr. C. J. Innocent, Architect, 17 George Street, Sheffield.

BERKHAMSTED.—Oct. 17.—For Building Shops, &c., for the Co-operative Society. Mr. J. F. Goodey, Architect, 2 Victoria Chambers, Colchester.

BISHOP'S CASTLE.—Oct. 27.—For Construction of Waterworks in the Borough. Mr. Aaron Hamar, Borough Surveyor, Bishop's Castle.

BISHOPWEARMOUTH.—Oct. 20.—For Erection of School Buildings at the Grange. Mr. T. W. Bryers, Clerk to the School Board, 15 John Street, Sunderland.

BRIGHTON.—Oct. 13.—For Building Public Elementary Schools for 700 Children, near Park Road. Mr. T. Simpson, Architect, 16 Ship Street, Brighton.

CAMBERWELL.—Oct. 31.—For Extension of Infirmary, Havil Street, for the Guardians. Mr. R. P. Whellock, Architect, 45 Finsbury Pavement, E.C.

CHESHUNT.—Oct. 16.—For Sinking Well and Making Artesian Boring, &c., at Pumping Establishment, and Supplying Cast-iron Water Mains, &c. Mr. Thomas Bennett, Engineer, Turner's Hill, Cheshunt.

COCKERMOUTH.—Oct. 24.—For Heightening Boundary Walls at Board School, Wyndham Row. Mr. John Musgrave, Clerk to the School Board, Cockermouth.

CWMDANDDWR.—Oct. 15.—For Vicarage, Outbuildings and Approach Road. Mr. S. H. Cowper-Coles, Architect, Rhayader.

DENABY.—Oct. 13.—For Erection of Corrugated Iron Buildings, Brick and Stone Buildings, Wood Buildings, Wood Fencing, Entrance Gates, &c. Mr. Ernest Spon, C.E., 35 New Broad Street, London.

DENTON.—For Heating Free Library with Hot Water. Messrs. T. D. & J. Lindley, Architects, Ashton-under-Lyne.

DEVONPORT.—Oct. 18.—For Construction of Pipe Sewer (1,840 feet), for Johnston Terrace District. Mr. John F. Burns, Borough Surveyor, Municipal Offices, Ker Street, Devonport.

EAGLEY.—Oct. 25.—For Building Boundary Wall at Sewage Works and Retaining Wall to River Eagley. Mr. James Parkinson, Surveyor, 50 Station Road, Turton.

EGREMONT.—For Rebuilding Public-house, Cottage and Stables. Mr. W. F. Charter, Brewery, Egremont.

ENDON.—For Building Semi-detached Houses. Messrs. R. Scrivener & Sons, Architects, Howard Place, Hanley.

EUSTON.—Oct. 17.—For Building Bridge at Diggle Station, Yorks.; Goods Station at Oldbury; Additions to Passenger Station, Oldham; Carriage Shed and Shop, Willesden; and Roofing at Broad Street Goods Station. The Engineer, Euston Station.

FULHAM.—Oct. 17.—For Building Mortuary and Coroner's Court at Cemetery. Mr. J. P. Norrington, Surveyor, Vestry Offices, Walham Green, S.W.

HASTINGS.—Oct. 15.—For Building Warehouses, &c., West Marina, for Mr. G. G. Gaze. Messrs. Elworthy & Son, Architects, 101 London Road, St. Leonards-on-Sea.

HELSTON.—Oct. 20.—For Construction of Storage Reservoir at Tregathenan, and Laying Main Pipes (four miles). Mr. S. W. Jenkin, C.E., Liskeard.

LEADENHALL MARKET.—Oct. 19.—For Underground Urinals, Water-closets, &c. Mr. Henry Blake, Sewers Office, Guildhall, E.C.

LIMERICK.—Oct. 25.—For Building Constabulary Barrack. Office of Public Works, Dublin.

MANCHESTER.—Oct. 15.—For Building Superstructure of Premises, for the National Provincial Bank of England. Mr. Alfred Waterhouse, R.A., 20 New Cavendish Street, W.

NEWCASTLE-ON-TYNE.—Oct. 18.—For Building Wesleyan Mission Hall and Schools, Beaumont Street. Mr. J. W. Taylor, Architect, 33 Westgate Road, Newcastle-on-Tyne.

NORMANTON.—Oct. 18.—For Building Public Offices, Stables, &c., High Street. Messrs. C. W. Richardson & F. Simpson, Architects, Southgate Chambers, Wakefield.

PETERBOROUGH.—For Building Villa. Mr. M. Hall, Huntly Grove, Peterborough.

RAMSEY.—Oct. 22.—For Construction of Sewage Outfall Works. Mr. J. Mansergh, Engineer, 3 Westminster Chambers, Victoria Street, Westminster.

RAWTENSTALL.—Oct. 17.—For Construction of Pipe Sewer, &c. Mr. J. E. Swindlehurst, Surveyor, Rawtenstall.

REDHILL.—Oct. 17.—For Building Sheds at Magazine, Brighton Road. Mr. F. D. Clark, Borough Surveyor, Market Hall, Redhill.

REIGATE.—Oct. 17.—For Repairs to Police Station, High Street. Mr. F. D. Clark, Borough Surveyor, Market Hall, Redhill.

SEASCALE.—Oct. 20.—For Building Two Dwelling-houses, Warehouse, Large Room, Stabling, and Coach-house. Messrs. J. Wrigley & Sons, Seascale.

SHIPLEY.—Oct. 18.—For Building Board School and House. Messrs. W. & J. B. Bailey, Architects, 9 Market Street, Bradford.

STOKE-UPON-TRENT.—Oct. 15.—For Alterations to Wheat-sheaf Hotel. Mr. Edwin Penn, Architect, Stoke-upon-Trent.

\* Names and addresses to be forwarded not later than date.



THORNTON.—Oct. 18.—For Building Brewery at West Scholes. Mr. John Drake, Architect, Winterbank, Queensbury.

WAKEFIELD.—Oct. 15.—For Building Cottage at Waterworks, Spa Clough. Mr. C. J. Hudson, Town Clerk, Town Hall, Wakefield.

WAKEFIELD ARDSLEY.—Oct. 15.—For Building Cottages at Waterworks, Ardsley and Rishworth. Mr. C. J. Hudson, Town Clerk, Wakefield.

WEST BROMWICH.—Oct. 23.—For Laying Cast-iron and Earthenware Pipes with Manholes, Ventilators, &c. Mr. John T. Eayrs, Borough Engineer, Town Hall, West Bromwich.

WEST VALE.—Oct. 15.—For Building St. John's Vicarage. Mr. W. H. D. Horsfall, Architect, Albany Chambers, Commercial Street, Halifax.

WORCESTER.—Oct. 31.—For Making Sewers and Works in connection. The City Surveyor, Guildhall, Worcester.

## TENDERS.

### APPERLEY BRIDGE.

For Building Mill, Shed, Engine-house, Boiler-house, and Chimney at Apperley Bridge, near Leeds. Messrs. JOWETT KENDALL & J. H. BAKES, Architects, Idle.

#### Accepted Tenders.

T. Obank & Sons, Idle, mason and joiner . . . £2,262 0 0  
J. Padgett, Idle, plumber and painter . . . 159 7 0  
T. & A. Thornton, Eccleshill, slater . . . 128 10 0

Contracts for ironwork and plastering were let at 454*l.* and 47*l.* 5*s.* respectively.

### BIRMINGHAM.

For Making Roads at Workhouse Infirmary. Mr. W. H. WARD, Architect, Paradise Street, Birmingham.

Jones & Fitzmaurice, Birmingham . . . £2,139 0 0  
Birmingham Val de Travers . . . 1,995 10 0  
Dorse & Son, Brierley Hill . . . 1,890 0 0  
Palmer, Birmingham . . . 1,789 0 0  
Bissett & Sons, Sheffield . . . 1,750 0 0  
Innes & Wood, Birmingham . . . 1,680 0 0  
Biggs, Birmingham . . . 1,625 0 0  
CURRALL & LEWIS, Birmingham (accepted) . . . 1,595 0 0

### BIRMINGHAM—continued.

For Stained-glass Windows for the Birmingham Law Courts.

Hardman & Co., Birmingham . . . £2,750 0 0  
Clayton & Bell, London . . . 2,617 0 0  
Powell & Son, London . . . 1,980 0 0  
HEATON, BUTLER & BAYNE, London (accepted) 1,700 0 0

### BRIGHTON.

For Extending Outfall Sewer at Portobello, Telscombe, Sussex, 800 feet further into the Sea, and Works in connection, for the Brighton Intercepting and Outfall Sewer Board. Mr. P. C. LOCKWOOD, C.E., Town Hall, Brighton.

J. Aird & Son, Lambeth . . . Iron. £20,000 Steel. £18,000  
W. Hill & Co., Westminster . . . 13,829 —  
J. HARRISON & SON, Brighton (accepted) 11,500 9,900

### BURTON-ON-TRENT.

For Alteration and Extension of Board Schools, Victoria Road and York Street, Burton-on-Trent. Mr. REGINALD CHURCHILL, Architect, Burton-on-Trent. Quantities by the Architect.

Slater & Walker, Derby . . . £4,245 0 0  
Jarvis, Banbury . . . 4,100 0 0  
Hunter, Burton-on-Trent . . . 3,619 12 6  
Chamberlain, Burton-on-Trent . . . 3,550 0 0  
Maddocks, Burton-on-Trent . . . 3,490 0 0  
Mellors, Burton-on-Trent . . . 3,464 0 0  
Willcock, Wolverhampton . . . 3,390 0 0  
HODGES, Burton-on-Trent (accepted) . . . 3,387 0 0  
Wigley, Burton-on-Trent (withdrawn) . . . 3,221 0 0

### COLYTON.

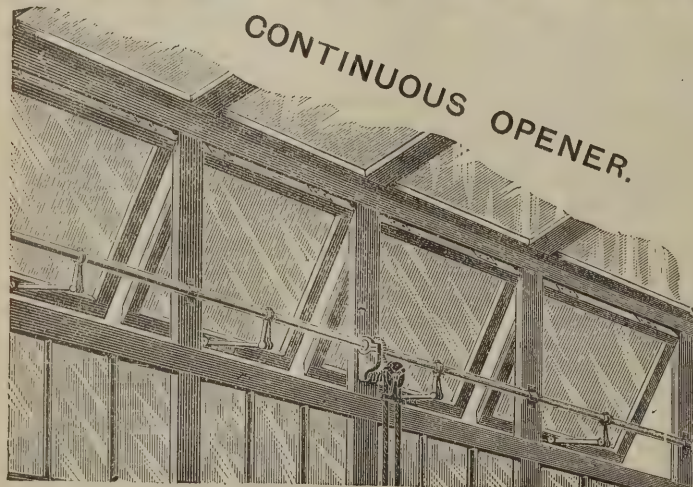
For Alterations, Repairs, &c., to the Colcombe Castle Hotel, Colyton, Devon, for Messrs. Mitchell & Co., Wine and Spirit Merchants, of Chard. Messrs. PINNEY, SON & FARMER, Architects, Axminster.

F. Hill, Chard . . . £205 0 0  
Richards, Burch & Smith, Colyton . . . 185 0 0  
Turner & Skinner, Honiton . . . 172 0 0  
H. Parker, Seaton . . . 170 0 0  
PARSONS & PERRYMAN, Axminster (accepted) . . . 170 0 0  
Haddrell & Ashford, Chard . . . 140 0 0

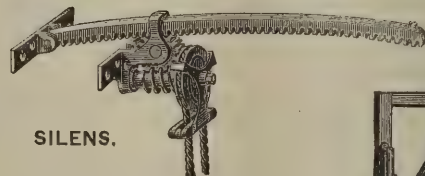
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Messrs. W. & R. LEGGOTT, Bradford.

I remain, yours obediently,

R. DAVIES, Architect.

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## CARDIFF.

For Repairs to Atlas Works, Canton, under the superintendence of Mr. WM. EVE, F.S.I., 10 Union Court, Old Broad Street, E.C.  
 O. Purnell, Cardiff . . . . . £220 0 0  
 C. Bird, Cardiff . . . . . 200 0 0  
 W. Symonds, Cardiff . . . . . 195 10 0  
 C. C. DUNN, Cardiff (accepted) . . . . . 189 0 0

## EGREMONT.

For Mason and Joiner Work required in the Repairs of Lamplugh Mill, Egremont, Carnforth, after Fire.  
 J. GREEN, Pardshaw, Cockermouth (accepted) . £139 10 0  
 J. Moffat, Egremont . . . . . 136 10 0  
 Chappell & Son, Moor Row . . . . . 105 0 0  
 J. Twiname, Brigham . . . . . 84 5 0

## Joinerwork only.

D. Tolson, Lamplugh . . . . . 45 0 0  
 Chappell & Son . . . . . 44 0 0  
 Lindsay & Grave, Cockermouth . . . . . 33 0 0  
 J. Twiname, Brigham . . . . . 33 0 0

## FARSLEY.

For Building Stock-rooms and Offices, &c., for Mr. E. Woodhouse, Sunny Bank Mills, Farsley. Mr. C. S. NELSON, Albert Chambers, Park Row, Leeds.  
 APPELVARD. BROS., Bramley (accepted).

## FERNDALE.

For Building Five Houses, Taff Street, Ferndale.

	Per House.
J. Davies, Treorky . . . . .	£162 0 0
W. Jones, Ferndale . . . . .	149 0 0
W. Morris, Ferndale . . . . .	146 15 0

## LINDLEY.

For Additions to Acre Mills, Lindley, Huddersfield. Messrs. J. KIRK & Sons, Architects, Huddersfield.

## Accepted Tenders.

H. & L. Fox, Lindley, excavator and mason.  
 Crowther & Wilkinson, Marsh, carpenter and joiner.  
 J. Noble, Birchencliffe, plasterer.  
 T. Armitage, Huddersfield, plumber.  
 Earnshaw Brothers, Lindley, painter.  
 Pickles Brothers, Huddersfield, slater.  
 G. W. Crosland & Co., Huddersfield, ironfounder.

## LEWISHAM.

For New Machine Bakery and Stabling at Riverdale Mills, Lewisham, for Mr. John Wallace. Mr. HORACE T. BONNE R, A.R.I.B.A., Architect, 29 and 30 King Street, Cheapside, and Lewisham.  
 Kirk & Randall, Woolwich . . . . . £1,535 0 0  
 Jerrard, Lewisham . . . . . 1,494 0 0

## LONDON.

For Removal of existing Swing Bridge and Constructing New Bridge, chiefly of Iron, across the Grand Surrey Canal, Canterbury Road, Peckham, together with the Approach Road, Sewers, &c.

Mowlem & Co. . . . . £8,963 0 0  
 J. Biggs . . . . . 7,990 0 0  
 G. Double . . . . . 7,588 11 3  
 W. WEBSTER (accepted) . . . . . 7,200 0 0

For Gas Services and Fittings to the Mercers' Arms and Houses adjoining in Castle Street and Mercer Street, Long Acre, for Messrs. Combe & Co., Limited. Mr. B. ELSON, Architect, 115 Long Acre, W.C.

Buckley & Beech . . . . . £129 10 0  
 COMYN CHING & Co. (accepted) . . . . . 111 8 6

## Pneumatic Bells to same.

Trindar . . . . . 34 0 0  
 Buckley & Beech . . . . . 31 16 0  
 COMYN CHING & Co. (accepted) . . . . . 29 0 0

For Erection of Three Houses and Warehouse in Leswin Road, Stoke Newington, for Mr. A. Hart. Mr. WM. EVE, F.S.I., Architect, 10 Union Court, Old Broad Street, E.C.

J. Holloway . . . . . £3,887 0 0  
 Atherton & Latta . . . . . 3,375 0 0  
 Higgs . . . . . 2,990 0 0  
 Holliday & Greenwood . . . . . 2,977 0 0  
 Stimpson & Co. . . . . 2,930 0 0  
 Johnson . . . . . 2,912 0 0  
 Holland . . . . . 2,898 0 0  
 Gould & Brand . . . . . 2,885 0 0  
 Anley . . . . . 2,860 0 0  
 Harris & Wardrop . . . . . 2,838 0 0  
 Godfrey & Son . . . . . 2,780 0 0  
 JACKSON & TODD (accepted) . . . . . 2,735 0 0  
 Dabbs\* . . . . . 2,697 0 0

\* Withdrawn in consequence of the increased price of materials between date of tender and its acceptance, viz., seven weeks.

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## LONDON—continued.

For Alterations and Additions to the Albion Tavern, Thornhill Road, Barnsbury, for Mr. A. Watson. Mr. ARTHUR F. WRIGHTSON, Architect. Quantities by Mr. W. Heelis, 26 Budge Row, Cannon Street, E.C.

Drew & Cadman	£1,723	0	0
Tatmur	1,658	0	0
Pickford	1,594	0	0
Kellaway	1,580	0	0
Green & Lee	1,510	0	0
ALLEN & SONS (accepted)	1,336	0	0

For Alterations and Additions to the Golden Fleece, Essex Road, Islington, for Mr. H. Carter. Mr. ARTHUR F. WRIGHTSON, Architect, 26 Budge Row, Cannon Street, E.C.

PICKFORD (accepted)	£590	0	0
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## LOUGHBOROUGH.

For Street Improvement Works, for Mr. R. S. Clifford. Mr. GEORGE HODSON, C.E., Loughborough.

J. Hawley & Son, Ilkeston	£960	0	0
Raynor & Cope, Nottingham	715	11	8
A. & S. Main, Loughborough	710	0	0
Dickson, St. Albans	697	0	0
J. Tomlinson, Derby	597	0	0
A. Faulks, Loughborough	585	0	0
HOLME & KING, Liverpool (accepted)	518	0	0

## PETERBOROUGH.

For Building Three Cottages, Granby Street. Mr. J. G. STALLEBRASS, Architect, Bamber Street, Peterborough.

Alderton & Wheeler, Cambridge	£512	10	0
Pitts & Ireson, Yaxley	441	0	0
Bridgefoot & Smith, Peterborough	437	15	0
Rowe, Peterborough	425	10	0
Hammond, Peterborough	406	10	0
Kidd, Peterborough	395	9	0
Libby & Hill, Peterborough	395	0	0
Sharp & Ireson, Peterborough	390	0	0
Binder & Martin, Peterborough	385	0	0
GUTTRIDGE, Peterborough (accepted)	384	0	0
Wright, Peterborough	380	0	0
Architect's estimate	394	10	0

## QUEENSBURY.

For Building Combing Shed at Bradshaw Mills. Mr. JOHN DRAKE, Architect, Winterbank, Queensbury. Quantities by the Architect.

## Accepted Tenders.

E. & E. Balmforth, Queensbury, mason	£227	0	0
Roberts & Co., Cutler Heights, iron	119	15	0
J. Farnell, Queensbury, joiner	59	10	0
Varley & Roebuck, Thornton, plumber	59	0	0
J. Taylor, Causeway Foot, slater	51	0	0
J. Taylor, Causeway Foot, plasterer	19	0	0
Varley & Roebuck, Thornton, painter	12	15	0

## SALISBURY.

For New Public Hall (to Seat 1,000 Persons) in Endless Street and Chipper Lane, Salisbury, for Mr. Arthur Whitehead. Mr. FRED BATH, F.R.I.B.A., F.S.I., Architect, Crown Chambers, Salisbury.

WEBB & Co., Salisbury (accepted).

For Alterations, Additions, and Reseating the Wesleyan Chapel, Salisbury, for the Trustees. Mr. FRED BATH, F.R.I.B.A., F.S.I., Architect, Crown Chambers, Salisbury. No Quantities.

Jerrard & Stevens, Salisbury	£1,710	10	0
Webb & Co., Salisbury	1,627	2	9
W. G. & C. S. YOUNG, Salisbury (accepted)	1,568	7	6

## SOUTHAMPTON.

For Converting a Large Store, Eling, near Southampton, into a Steam Roller Flour Mill, for Messrs. Neave & Co., of Fordingbridge. Mr. FRED BATH, F.R.I.B.A., F.S.I., Architect, Crown Chambers, Salisbury. No Quantities.

H. J. Sanders, Southampton	£1,482	0	0
H. J. Kite, Salisbury	1,303	19	0
Webb & Co., Salisbury	1,282	5	1
C. MITCHELL, Woodhalls, Salisbury (accepted)	1,176	10	7

## SWANSEA.

For Alterations to Longlands Hotel, Swansea, for Mr. John Donn. Mr. T. P. MARTIN, Architect, Swansea.

H. BILLINGS (accepted).

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SWINDON.

For various Works to be Executed at Medbourne Farm, Lyddington, Swindon, Wilts, for Miss Ada Akers. Mr. WILLIAM DREW, M.S.A., Architect, 22 Victoria Street, Swindon.

Flewelling . . . . .	£242	0	0
Payne . . . . .	210	10	0
Herring . . . . .	194	10	0
Ponting . . . . .	191	0	0
Wiltshire . . . . .	190	0	0
Williams . . . . .	189	9	0
T. BARRETT, Swindon (accepted)	181	18	0

WATFORD.

For Building Conservative and Constitutional Clubs, Watford. Mr. W. H. LYME, A.R.I.B.A., Architect.

Jones, Watford . . . . .	£3,135	0	0
George Sear, Watford . . . . .	2,300	0	0
W. B. Neal, Watford . . . . .	2,154	0	0
T. Waterman, Watford . . . . .	2,057	0	0
N. & E. Sear, Watford . . . . .	2,050	0	0
T. TURNER, Watford (accepted)	1,957	0	0

WAVERTREE.

For Construction of Pipe Sewer, Garnet Street and Fletcher Grove, for the Wavertree Local Board. Mr. I. DIXON, Surveyor, Town Hall, Wavertree.

W. Burrows, Wavertree . . . . .	£264	16	0
J. Dovenor & Co., West Derby . . . . .	245	0	0
J. Garnett, Liverpool . . . . .	226	18	0
R. Malabar, Liverpool . . . . .	201	9	0
J. White, Aigburth . . . . .	195	0	0
J. Hickman, Walton . . . . .	194	4	8
T. Catterall & Co., Liverpool . . . . .	189	3	0
J. M'Cabe & Co., Kirkdale . . . . .	185	0	0
L. MARR, Liverpool (accepted)	180	0	0

WEST BROMWICH.

For Cast-iron Pipes and Special Castings. Mr. J. T. EAYRS, Borough Engineer, Town Hall, West Bromwich.

Clay Cross Co., Chesterfield . . . . .	£2,563	11	3
Firmstone Bros., Stourbridge . . . . .	2,372	8	2
Staveley Co., Chesterfield . . . . .	2,239	7	9
Cochrane & Co., Dudley . . . . .	2,176	8	9
BAILEY, PEGG & Co., London (accepted)	2,164	5	5
Stanton Ironworks Co. . . . .	2,147	0	6
Duncan Bros., London (steel rivetted pipes)	2,080	0	0

WEST BROMWICH—continued.

For Construction of Pipe Sewers (9 miles), with Manholes, Ventilators, Flushing Chambers, &c., West Bromwich. Mr. J. T. EAYRS, Borough Engineer, Town Hall, West Bromwich.

G. Bush, Dalton-in-Furness . . . . .	£11,528	1	0
Jones & Fitzmaurice, Birmingham . . . . .	10,185	3	11
Pickthall & Son, Merthyr . . . . .	8,311	18	9
Turner & Son, Bilston . . . . .	7,867	16	9
J. Biggs, Handsworth . . . . .	7,844	19	9
Hughes & Son, Gornal . . . . .	7,780	3	3
A. Palmer, Birmingham . . . . .	7,535	2	4
Jevons & Son, Dudley . . . . .	7,403	13	4
J. Fell, Leamington . . . . .	7,300	0	0
G. Law, Kidderminster . . . . .	7,112	13	1
Small & Son, Handsworth . . . . .	7,000	11	10
R. C. BREBNER, Edinburgh (accepted)	6,811	5	0
G. Marshall, Darlington (withdrawn)	5,039	12	0

WEYMOUTH.

For Harbour and Pier Improvements, Weymouth. Mr. W. BARLOW MORGAN, Engineer.

Contract No. 1.—Dredging the Harbour.

Pethick, Plymouth . . . . .	£9,544	0	0
Smith, London . . . . .	8,327	0	0
Foster, Radcliffe-on-Trent . . . . .	7,900	0	0
Debnam, Plymouth . . . . .	6,900	0	0
Shelbourne & Co., London . . . . .	6,748	0	0
Fuller, London . . . . .	5,760	0	0
Gannaway, Southampton . . . . .	5,150	0	0
Perkins, Lymington . . . . .	5,000	0	0
Swales, Shoreham . . . . .	5,000	0	0
London & Co., Newport . . . . .	4,850	0	0
Brown Bros., Weymouth . . . . .	4,124	0	0
THOMPSON, Chatham (accepted)	3,990	0	0

Contract No. 2.—Quay Wall, Custom-house Quay.

Johnson, Cork . . . . .	18,433	0	0
Ashwell, Gravesend . . . . .	18,000	0	0
Pethick, Plymouth . . . . .	16,344	0	0
Perkins, Lymington . . . . .	15,894	0	0
Bull & Co., Southampton . . . . .	14,550	0	0
Brown Bros., Weymouth . . . . .	13,620	0	0
Dickson, St. Albans . . . . .	10,739	0	0
Foster, Radcliffe-on-Trent . . . . .	10,650	0	0
SANDERS, London (accepted)	10,437	0	0
Debnam, Plymouth . . . . .	6,264	0	0

# H. W. COOPER & COMPANY, LIMITED,

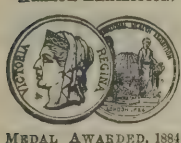
HEALTH EXHIBITION.

OPEN.

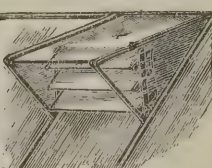
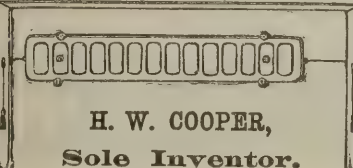
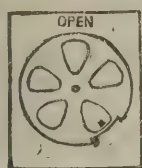
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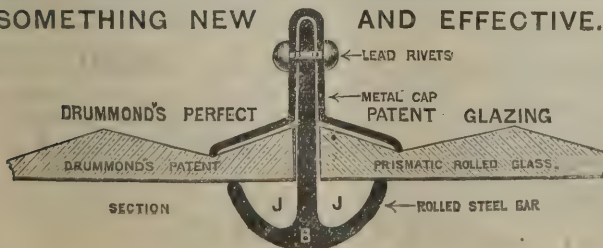
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## WEYMOUTH—continued.

## Contract No. 3.—Widening Esplanade and Pier, &amp;c.

Perkins, Lymington	£13,407	0	0
Ashwell, Gravesend	11,800	0	0
Foster, Radcliffe-on-Trent	10,900	0	0
Dickson, St. Albans	10,389	0	0
Pethick, Plymouth	9,994	0	0
Sanders, London	9,776	0	0
Jesty & Son, Weymouth	9,768	0	0
Bull & Co., Southampton	9,765	0	0
Brown Bros., Weymouth	8,446	0	0
Debnam, Plymouth	8,307	0	0
WHETTAM, jun., Weymouth (accepted)	8,260	0	0

## Contract No. 4.—Quay Wall, Hope Quay and Cove Road.

Perkins, Lymington	10,166	0	0
Pethick, Plymouth	6,454	0	0
Johnson, Cork	5,747	0	0
Sanders, London	5,623	0	0
Ashwell, Gravesend	5,600	0	0
Foster, Radcliffe-on-Trent	5,390	0	0
Bull & Co., Southampton	5,263	0	0
Dickson, St. Albans	5,200	0	0
Jesty & Son, Weymouth	4,739	0	0
Debnam, Plymouth	4,716	0	0
Brown Bros., Weymouth	4,449	0	0
WHETTAM, jun., Weymouth (accepted)	4,380	0	0

## For Works conditionally to the Whole being Accepted.

	No. 1.	No. 2.
Pearson & Son, London	£6,583	£13,293
Godfrey, Swansea	6,000	11,600
Waddell, London	5,500	9,000
Parker & Co., Cardiff	—	13,500
Krauss, Bristol	—	11,600
Lawton, Bristol	—	11,610
Harrison, Brighton	5,350	11,500
	No. 3.	No. 4.
Pearson & Son, London	14,499	6,674
Parker & Co., Cardiff	12,500	5,800
Waddell, London	11,500	6,000
Godfrey, Swansea	10,900	4,900
Lawton, Bristol	10,232	5,100
Krauss, Bristol	8,973	4,379
Harrison, Brighton	8,500	4,900

## YSTRADYFODWG.

For Street Improvement Works, Ystradyfodwg. Mr. J. W. JONES, Surveyor, Pentre, Rhondda.

J. Grun, Ferndale	£1,332	16	5
T. Rees, Merthyr Vale	1,241	5	9
W. Mathias, Treorky	1,264	2	6
J. DAVIS, Treorky (accepted)	1,175	15	3
J. Preece, Hereford	1,172	14	5

## TRADE NOTES.

THE green slates for the roofing of the mansion for the Earl of Sefton, K.G., at Abbeystead, Wyresdale (illustrated in *The Architect* of last week), were supplied by the Elterwater Green Slate Co., Ambleside.

AN award by Sir Thomas Martineau, the president-arbitrator of the Midland Iron Trade Wages Board, in the question lately raised by the ironworkers' application for the advance of 12½ per cent. in wages, is to the effect that puddlers' wages, which govern those of other classes of operatives, shall be raised on and after the 20th inst. from 6s. 9d. to 7s. 3d. per ton. This is an advance of 6d., or nearly 7½ per cent. This is subject to one month's notice on either side. At the meeting of the Midland Iron and Steel Wages Board, held at Birmingham on Monday, to consider the provisions for the establishment of a sliding scale to govern wages in the iron and steel trades within the area of the Board, Mr. B. Hingley, M.P., who presided, referred to the wages question just settled, and expressed a hope that the operative members were now convinced that the employers did right in referring the question to an arbitrator. The masters did not wish to throw any impediment in the way of operatives, though they had now the worst of the bargain, having made all their contracts for the next three months. With regard to the sliding scale, it was agreed that accountants should ascertain the figures for October, November, and December of all classes of iron, excluding charcoal iron. The names of about eighteen firms were then put forward, and the question of selecting those whose books should be inspected was postponed.

LARGE orders for steel for bridgework for the Bengal and Nagpur and another Indian railway have been received in Staffordshire. The Steel and Ingot Iron Company, Bilston, have booked four thousand tons, consisting mainly of plates, angles, ties, and bars. Also a Scotch bridge engineer has sent

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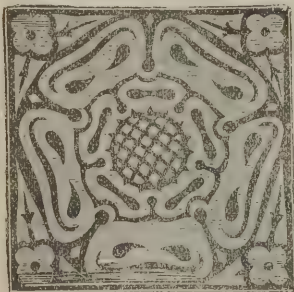
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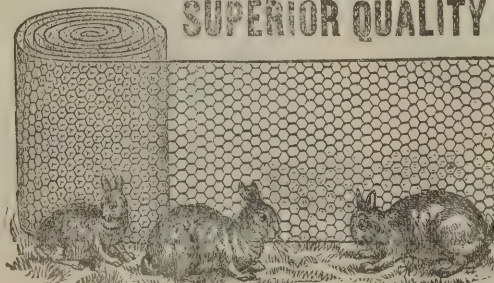
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orders into Staffordshire for large steel bars and angles for Indian bridge construction instead of buying in Scotland.

THE Goldsmiths' Company have resolved to contribute an endowment, out of their corporate funds, of not less than 2,500*l.* a year towards the maintenance of a Polytechnic Institute to be established at New Cross, on the site now occupied by the Royal Naval School.

A MANCHESTER Scotchman, writing under date of October 6, says:—Up to and including Saturday last, the Glasgow Exhibition had been open to the public 125 days. The figures relating to the Manchester Exhibition, quoted below, represent the attendances during precisely the same number of days, and also the corresponding days of the week:—

	Admissions by Pay- ment.	Season Ticket- holders.	Exhibitors and Attendants.	Total.
Glasgow .	1,952,940	1,978,982	328,817	4,260,739
Manchester	2,230,246	882,592	332,649	3,445,478

It appears, [therefore, that the] turnstiles have registered 815,261 more attendances in Glasgow during the period named than in Manchester. The season ticket-holders during the first three months were most faithful in their attendances. During August, however, they evidently retired "down the water," to recruit their energies, but in September they appear to have returned with redoubled force, for whereas a month ago their visits exceeded by 809,139 the corresponding attendances in Manchester, they have now sprung to 1,096,390 in excess. Some 47,000 season tickets have been issued in Glasgow, against 35,000 in Manchester. In Glasgow, therefore, each season ticket-holder has, on an average, paid 42 visits to the Exhibition, as against 25 in Manchester. Up to September 29, 277,306 more persons had paid for admission to the Manchester Exhibition than to Glasgow.

At the meeting of the Bridgnorth Town Council last week the committee appointed to superintend the repairs of the town hall reported the lowest tender to be that of Messrs. Bradney & Co., Wolverhampton, out of five contractors who sent in estimates. The above firm also secured the contract for carrying out the work proposed by the Jubilee Committee. In addition to the proposed alterations now being carried out, stained-glass windows will replace the old ones, the funds for this having been subscribed by private individuals. The report was adopted.

MESSRS. D. & T. STEVENSON, engineers to the Scottish Fishery Board for Harbours, have completed their survey of the shore at Auchmithie, near Arbroath, and furnished a preliminary sketch plan of the harbour which it is proposed to make there, which would cost about 4,000*l.* It is proposed to run a protection wall or pier along the inner line of rocks, enclosing the present beach, which is to be excavated.

IN their timber trade circular, dated the 4th inst., Messrs. Mackay, of Liverpool, say that the long-expected revival of trade has set in, and its effects are being experienced throughout Great Britain, Europe, and America. Shipping, both steam and sailing, is in demand for import and export trade, and rates of freight for all kinds of cargo have risen proportionately. For timber, particularly spruce deals, the demand has been during the past month a fair one. The imports during this period have not been large. The policy pursued by shipowners in now requiring "extravagant" rates of freight has had the effect of checking shippers from sending goods to this country. Unfortunately the freight rate seems still increasing.

THE Birmingham School Board has authorised the raising of a loan of 18,665*l.* for providing a site and school buildings in Cromwell Street, Duddeston. The schools are to accommodate 1,080 children, and the cost of the land, containing 5,150 square yards, is 7,500*l.*, and the builder's tender amounts to 10,083*l.*

THE two domes of the Palace of the Liberal Arts on the Champ de Mars, Paris, are finished, and only await the ceramic tiles on the roof, to the number of 100,000. These are of varying dimensions and colour, there being 630 sorts. The work will have the aspect of mosaic, the bricks not being superposed, but fitted into one another.

IT is proposed to introduce a system of heating by hot water for the church at Queensferry, N.B.

At the meeting of the Metropolitan Board of Works on Friday the following recommendation of the Building Act Committee was approved of. The committee reported, with reference to the letters from Mr. S. F. Clarkson, district surveyor, and the Vestry of Chelsea, relative to the erection of bay windows and balconies at No. 63 Cadogan Square, Chelsea, in despite of the refusal by the Board of August 10 last of their consent to the erection in question; and recommended that the Vestry be informed, in reply to their letter that they can take the necessary proceedings in the matter, and that Mr. Clarkson be so informed.

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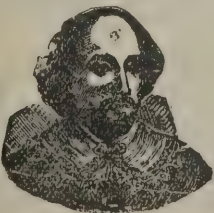
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AWARDS—  
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MESSRS. F. & H. FRANCIS, the architects of the Albert Palace at Battersea, call attention to the fact that all the interior fittings of that structure, including the great organ, are to be sold by auction next week, under distraint for rent, by order of the Office of Works, and have entered a protest against the prospective break-up of the interior of the palace at a time when a movement has been started to secure the building as one of the South London Polytechnics.

ON Tuesday possession was formally handed over to the Richmond Vestry, Surrey, of the Castle Hotel there, the gift of Sir John Whittaker Ellis, M.P.

A COLLECTION of photographs, chiefly picturesque subjects of a rustic or marine character, by Mr. Frank M. Sutcliffe, of Whitby, is being exhibited at the Camera Club, 21 Bedford Street, Covent Garden. The exhibition is the first of a series. Effects of twilight, moonshine, mist, wind, calm, sunlight, and shadow are depicted with most satisfactory results.

MESSRS. E. E. CROUCHER & CO. advertise a sale by auction of peculiarly choice sites of freehold building land at Crouch End, having frontages to Weston Park and other roads. This land, being close to three stations and surrounded by houses of a high class, will no doubt command considerable competition.

ALTERATIONS have been made to the Great Assembly Hall, Mile End Road, London, embracing the ventilation, Messrs. Robert Boyle & Son's latest improved patent self-acting air-pump ventilator being used for the extraction of the vitiated air.

THE Sanitary Committee of the Bradford Town Council intend to visit Leeds and other places, in order to inspect refuse destructor works, in view of erecting new works at Bradford.

AN inquiry will be held by the Local Government Board, on the application of the Scarborough Town Council, for sanction to borrow 10,000*l.* for works of street improvements, for providing stabling and a pinfold, and for purposes of public pleasure-grounds.

THE Carpenters' Company Free Lending Technical Library, containing the best works on carpentry and joinery, is now open every day from ten till four and Friday evenings from five till eight P.M., at the Company's Hall London Wall. Catalogues and full particulars may be obtained by application to the librarian.

THE wrought-iron opening casements for the residence, Abbeystead, illustrated last week, were made by Messrs. Burt & Potts, of York Street, Westminster. The stone and wood-carving were done from the designs of the architects, Messrs. Douglas & Fordham, by Mr. J. J. Millson, of Manchester.

A LYCH-GATE has been erected at the parish churchyard, Charlton Horethorne. The gates are about 3 feet high, hung with wrought-iron hinges, fitted with wrought-iron ring handle, latch, bolt, and Chubb's lock. The ironwork, including five hundred screws in the roof rendered rust-proof before being used, was supplied by Messrs. Priest & Sons, Bristol. The work has been carried out by Mr. Oliver Keeling, Timsbury, from the plans and under the personal superintendence of Mr. J. Spencer, architect, of Green Hill, Timsbury, Bath.

THE heating and ventilation of St. Paul's Church, Luton, Beds, has been carried out by Mr. John Grundy, of London and Tyldesley.

THE prospectus of the new company, entitled Messrs. Sam Deards & Company, Limited, has been issued. The company has been formed for the purpose of purchasing, continuing, and developing the old-established business of horticultural and hot-water engineer, carried on by Samuel Deards, and of the patents of "Victoria Dry Glazing," "Champion Coil Boiler," and "Princess Louise Coil Grate."

#### SAFETY OF BUILDINGS IN THE CITY.

AT the meeting of the City Commissioners of Sewers on Tuesday, Mr. Moore drew attention to the serious subsidence of property in King William Street and Arthur Street West, which was alleged to be due to the construction of the subway under the Thames to Southwark. The premises were all highly rented, and one set was rated at 1,500*l.* It was an extraordinary thing to see such buildings literally held up by crutches. The engineer stated that the subway was being constructed by a company under statutory powers, and the matter was in the hands of the district surveyor. Mr. Moore observed that something ought to be done to protect the occupiers. Mr. Bridgman said he would move that it be referred to a committee to inquire what steps, if any, were necessary to be taken to insure the public safety. The solicitor pointed out that the public safety was in the hands of the district surveyor.

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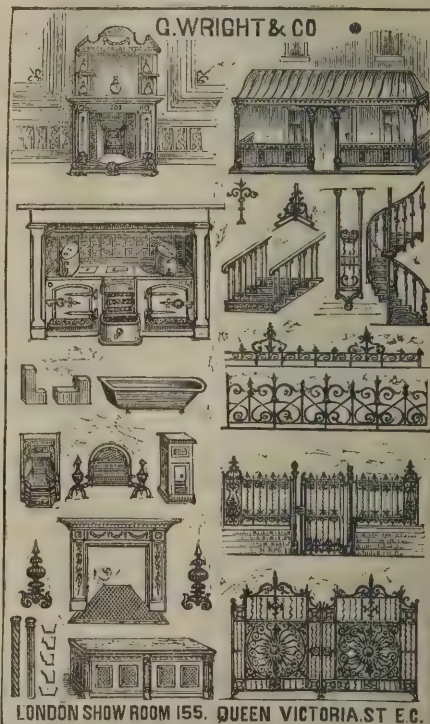
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## PROGRESS OF A SCOTCH TOWN.

At the last meeting of the present Town Council of Ayr, held on Monday, Provost Kilpatrick, who presided, said that he did not intend to seek re-election to the Council. He thanked the members of this and the previous Councils for the consideration they had always extended to him during the six years he had been provost of Ayr. In that time work had been done and measures carried through which he hoped would prove of great benefit to the town. In the first year he had been elected provost the question of the new bridge had come up. The Town Council had found that the Bridge Trust was insolvent; and as the bridge would ultimately fall to be taken over by the town of Ayr, the Council had conceived it to be their duty to take up the matter at once, and after many meetings with the County Road Board an agreement had been made whereby the county of Ayr undertook to pay nine-twentieths and the town eleven-twentieths of the debt. This debt had amounted to something like 13,000*l*. They had fifty years to liquidate the debt, and he believed that in two or three years the Bridge Committee would be enabled to reduce the assessment. The next question that had come up before the Council was the question of an additional water supply for the town. For some summers before the new scheme was promoted there had been a scarcity of water, and it had to be shut off the town during the night. The Council of the day felt that the matter was urgent. Mr. James Wilson, C.E., Greenock, had been called in to report upon the scheme. Mr. Wilson's report was against the extension of the old works. Recourse was then had to what are known as the Straiton Lochs, and Loch Finlas was eventually recommended as the source of supply. After getting an estimate of the cost the Council resolved to adopt the scheme and apply for a Bill. If they had not done so, for the last two years during the summer months the town would have virtually been without water. Although the assessment had been raised during the next eight or ten years, the water rate would be as low, if not lower, than before. They had been able to carry out the scheme without any Parliamentary opposition, and he believed they had constructed a scheme at less expense than any other scheme of a like magnitude in the country; and he believed that it would be found to give an ample supply of water to the town for many years to come. Without this new scheme building must have inevitably come to a standstill, as with the old scheme they would have been unable to supply many of the buildings in the town with a water supply. Then in promoting

this water Bill they had included in it a scheme for the improvement of High Street and Kyle Street. The properties necessary for the carrying out of this scheme had now been nearly all acquired, but there was still work to do in the carrying of this scheme to completion. Another feature of the Bill was the obtaining of the extension of the burgh, which feature he thought was a most important one. The burgh was now nearly double the size that it was before the passing of the Bill; and although at present it had not probably done them much good as far as rating was concerned, he looked forward in the course of the next twenty or thirty years, in the expectation that the extension of the boundaries would materially lessen the rates in the burgh. But the paramount object they had in view in the extension of the burgh, he might mention, was to enable the Council to carry out the drainage of the town properly. But though this much had been done, there was still work to do. There was the completion of the improvement scheme, the new cattle market to be laid out and constructed, and, though much had been done in the repairing of the streets and roads within the town, there was still much to do.

## THEATRE EXITS AND FIRE RISKS.

APPLICATION was made on Monday before a Court of Justices by Mr. Cecil Beryl for renewal of the license of the Grand Theatre, Glasgow, in the name of Mr. Augustus Harris, of Drury Lane. Mr. Dunlop, of Tollcross, presided.

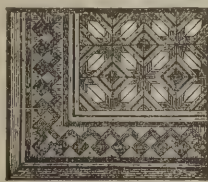
Mr. Angus Campbell, who appeared for Mr. Beryl, in submitting the application, said that Mr. Beryl had held a license for a theatre in Glasgow for nine years, without any exception being taken to his management or the slightest complaint being made against him. The Grand Theatre had been altered and reconstructed so as to satisfy the requirements of the Court and of the Master of Works. Mr. Harris's lease expired in November, but Mr. Harris had no objection to the license being made out in Mr. Beryl's name. He submitted that there should be some slight modification of the regulation relating to the number of firemen in a theatre. A reduction, he thought, might be effected without any disadvantage to the public and with considerable advantage to Mr. Beryl. There were at present in the theatre four firemen and constables, at an expense of 3*l*. 15*s*. per week for the whole. Half that number was sufficient. The theatre was quite close to the Northern fire and police stations.

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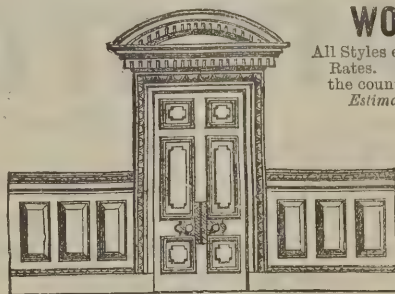
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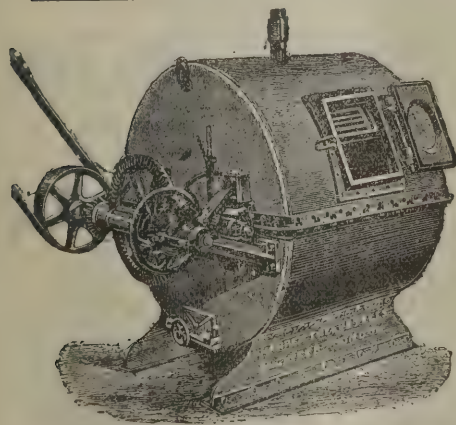
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The Chairman said that on a former occasion some discussion took place as to the power of the Court to deal with overcrowding. They must, in the interests of the public, have some control in this matter, and if there were no rules upon the subject in the Act of Parliament, then the Court must make rules, and attach them as conditions to the granting of the license. He asked Mr. Beryl if he objected to the rules which the Justices had drawn up against fire.

Mr. Beryl: No, I do not.

The Chairman remarked that Mr. Harris had objected to them.

Mr. Campbell submitted that Mr. Harris did not object to these rules; but he was brought into a criminal court, and there had a right to state any technical objection.

The Chairman said there was another rule which ought to be enforced: that against crowding in the passages.

Mr. Campbell: The rule is undoubtedly in the license.

The Chairman said he understood Mr. Beryl objected to it.

Mr. Beryl said that on the occasion to which the Chairman referred the case against him was never called.

The Chairman: I recollect you perfectly well. You said it was a very serious matter to you, because if the rule was enforced it would be the loss of so many hundred people.

Mr. Beryl: I don't recollect saying that.

Mr. Campbell said that on the occasion spoken of he appeared for Mr. Harris. What Mr. Beryl said then was, with all deference, that he had special leave in the South-Side Theatre for people to stand at the back of the pit; Mr. White said there was standing room. Under the rules applicable to his late theatre, Mr. Beryl had special permission for some 300 to stand behind the pit, and that was to be taken away when the license was renewed.

The Chairman: That will be taken away now, then.

Mr. Campbell: But this is a different theatre under different rules. We accept the rules and regulations laid down by the Court for the government of the Grand Theatre in their fullest integrity.

Mr. Gray (assessor): Yes, but with this addition. Rule 10 is—"No chairs or other loose article, or other obstruction, shall be placed in the lobbies, passages, or stairs." I understand the chairman to suggest that no person or persons shall be seated or allowed to stand there.

The Chairman: Yes.

Mr. Beryl: I quite agree to that.

Mr. Gray: Then Mr. Campbell has suggested that the number of firemen and constables should be reduced from four to two.

Mr. Campbell stated that at the Grand they had the largest permanent staff of any theatre in Glasgow.

The Chairman said that the payment of the firemen and constables was a very serious tax upon the lessee of the theatre, and he did not know that so many men added much to the safety of the public. If they had one practical fireman, and were so close to a fire-station, he did not think they wanted more.

The license was granted, under the additional restriction suggested by the chairman, and at the same time permission was given to reduce the number of policemen and firemen by half.

#### SHEFFIELD SHIP CANAL.

THE preliminary survey in connection with the scheme for the construction of a canal from Sheffield to Goole is practically completed, and the report of the engineers will be shortly made. The chief promoters of the scheme have had a meeting with the engineers at Goole, and went over the Aire and Calder system, starting at Ferrybridge and going down to Goole. There the docks were carefully inspected, as well as the various appliances for the prompt shipment of coal. Proceeding along the Ouse and Trent to Goole, they inspected the shipping accommodation, and afterwards followed along the Goole and Stamford canal system to Doncaster, and the canal system between Doncaster and Sheffield. A general agreement was formed, not only as to the practicableness of the scheme and the route the canal should take, but also that it could be carried out at a moderate cost. The fund for defraying the preliminary expenses amounts to 1,725*l*.

#### A VIENNA THEATRE.

THE perfection of theatre building has been attained in Vienna, if the opinion expressed by the Emperor of Germany on occasion of a visit just paid to the building can be relied on. Since that visit a Vienna correspondent of the *Daily News* has furnished the following account. It may be thought at once be pointed out that in the last lines of the letter the design of the structure is credited to the architect, as the correspondent at the outset creates an impression that architects had to be set aside and the hospital doctor called in to do the work:—

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The new Burg Theatre at Vienna, says the correspondent, is a marvel in many respects. Its beautiful situation, its unrivalled architectural beauty, the wealth of its decorations, the perfect taste of all its arrangements, are but on a level with all that has been done for the safety, the wellbeing, and comfort of the public. Opinions may perhaps differ, as people's tastes differ, whether the new Burg Theatre is to be called the most beautiful theatre in the world, but all must agree that it is the best lighted, best ventilated, and safest of all theatres that have as yet been built. When almost twenty years ago the Vienna Opera House rose on the bastions of the ancient city, the Emperor of Austria consulted first of all, not architects and artists, but the director of our great hospital as to what he thought the public wanted most when it sat for hours in a crowded house. At that time a new system of ventilation was tried, which succeeded so well that it has long been a saying in Vienna that there was no better way of spending an insupportably hot summer evening than by going to the Opera. The excellent system of ventilation has been improved upon, and may be said to have reached perfection in the new Burg Theatre. Three storeys below the auditorium and stage runs a broad, vaulted corridor of great height, which leads to a circular cistern through which the outer air is sucked from the Volksgarten. A strong current is blown into the subterranean gallery, where it passes over six hundred tin trays filled with water, and through damp flannel screens, so that it enters the inner corridors purified of dust, and quite damp.

The current is formed by a kind of windmill, a circular wheel with shovels, through the centre of which passes horizontally an enormous regulator, having the shape of a torpedo, which prevents the air from whirling in the wheel, and directs the current to a circular room, where it blows up against a wall, in the centre of which is a sharp projection which divides the current into two halves, one for the use of the stage, the other for the auditorium. The air now enters cylinders, which are kept warm by steam-engines. In the storey above the warm and cold air are mixed by an enormous tube, and when it is the right temperature it passes through a great number of tubes with valves into the auditorium. The greatest marvel is the inspection-room, with its handles and taps, its telephone and measuring instruments. With a slight movement of the hand it is possible to regulate from this room the current of air that enters the house, by means of chains to the doors below; to increase or decrease the heat and dampness, and to give

more or less ventilation to every seat or box in the house. Nearly one hundred thermometers and anemometers are in use for the perfect regulation of the beautifully-ventilated house. There are ten boilers and three large steam-engines, the latter for the exclusive use of the ventilator. The pure air reaches to the very top of the house, and the current escapes by a circular gallery in the roof, which on the outside is masked by a gilt iron railing.

The theatre is lighted with electricity throughout, and much thought has been given to the elegance and variety of the candleabra. In all there are 5,000 incandescent lights within the house, besides the great arc lights outside. The electric light is not produced in the theatre, but at the works of an English company in the Schenkenstrasse close by, and the electric current is led to the theatre underground. All over the theatre are distributed in small intervals red lanterns holding wax candles which are long enough to last through the evening, and which are sufficient to give light in case the electric light should by any chance be extinguished.

The theatre faces the Ring in its handsomest part, and is semicircular in front, square at the back. The semicircle forms in four storeys the entrance and three foyers, embracing the four tiers of boxes and the parterre. The square part at the back forms the stage. Two wings projecting on either side of the semicircle are entirely taken up by the staircases, under which are two private entrances, one for the Emperor's and the other for the Archduke's carriages. The public drive up under a covered doorway at either wing and at the foot of the great staircases. The occupants of the stalls and circle enter by the front, through nine large doors. The staircases at either side are lofty, broad, and entirely of marble, with railings of wrought and gilt iron. The staircase ceilings are divided into four great central pictures, showing the development of scenic representation from its first beginnings to the present day. At the top of each staircase there is a vestibule, separated from the former by two open niches, in which stand beautiful sculptured marble groups. On the staircases there are eight marble figures in niches, the portraits of the most famous actors of all times and nations, represented by Thespis, Kallipides, Quintus Roscius, Richard Burbage, Sebastian de Prato, Maria Calderon, Jean Baptiste Poquelin (Molière), David Garrick, Caroline Neuber, Friedrich Schröder, Conrad Eschhof, Wilhelm Iffland, Ferdinand Fleck, Ferdinand Esslaire, Louis Devrient, Carl Seydelmann. In the gable over the doors of the vestibules there is a marble group representing Bacchus and his train on one side,



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and Apollo on the other; and along the ceiling of the staircase there are twenty allegorical figures by Düll, and six ideal heads by Bager. The ceilings of the vestibules have two theatre scenes—one the Passion Play of Oberammergau, the other a modern theatre, both by Karger. There are four niches in each vestibule holding the life-size marble statues of Josef Talma, Edmund Kean, Rachel Felix, and Adelaide Ristori, being the most famous actors and actresses of all, and four celebrated directors of the old Burg Theatre—Sonnenfels, Schreyvogel, Laube, and Dingelstedt. Marble figures of children holding emblems and the Imperial arms are placed above the doors of these vestibules, which on one side lead to small circular refreshment-rooms, the walls of which are of polished marble, whilst the semicircular spaces above are painted with lovely children, flowers, and birds in delicate colours, by Robert Russ; and the ceilings, representing the fruits of the earth, by Hugo Charlemont, which in contrast seem rough and out of place. The refreshment-rooms at the two corners of the house lead into the great foyer, which takes up the whole front and forms part of a circle. This is a most splendid apartment, which may successfully compete with the galleries of Versailles and Herrenchiemsee. The walls of polished marble, with brass ornaments, are adorned with elaborate paintings of famous actors and actresses of the Burg Theatre in the costumes of their favourite parts. These portraits were found in Imperial lumber-rooms, and have been repainted, and as they are all quaint and original the effect is very good. But the chief beauty of the foyer is the three colossal pictures which adorn the ceiling, and in one of which Edward Charlemont, who painted all three, has given us a masterpiece. In the centre is Apollo with the Muses; to the right the Drama, being pictured by Iphigenia in Aulis; to the left Comedy, as shown in a "Midsummer Night's Dream." It is this picture which will attract connoisseurs long after the Burg Theatre will have ceased to be a novelty. In a wonderful moonlit landscape, which has nothing theatrical about it, move all the quaint or beautiful figures from the Dream, personified in so delicate a manner as to enchant both the eye and the heart.

The passages leading from the foyer to the large Court box and to the galleries behind the boxes in the first tier are lined with pictures of past actors, all found in the old Burg, and now looking quite handsome in panellings of carved oak. The passage to the Imperial box first leads to a reception-room daintily furnished with rococo embroidery and damask in pale

colours, that look as if a century at least had toned them down. The carved doors on this floor are also worth seeing, as models of a new industry of Vienna. The upholstery of the Court box, as indeed that of the whole theatre, is crimson plush with gold embroidery, but the woodwork in the boxes is not gilt, but carved oak. After the staircase and the foyer, the theatre appears small at the first glance, until we remember that it is exclusively devoted to drama, and cannot for reasons of acoustics be any larger. The ceiling is decorated with a wealth of paintings, and is divided into four fields by plastic groups representing the four essential qualities of human nature.

So much for the beauty of the new Temple to the Muses; now for the safety. Iron and stone are the two materials used almost exclusively. On the stage nothing but the thin flooring is of wood; everything above and below is of iron, of which two million kilogrammes have been used. For the shifting of the scenes ironwork is exclusively used. The stage is in reality 31 mètres broad, nearly 100 English feet, but 20 feet are taken up by the side scenes. It can be pushed backwards and forwards, raised and lowered, and the change of scenery is effected by slight movements, and without the least noise or danger. Hydraulic power is used. If as much iron as possible was used in the audience-room, nothing but iron is the material forming the stage and its complicated apparatus above, below, at either side, and behind. It would be impossible to set fire to this part of the theatre. The decorations for the different scenes are not kept here, but at a dépôt some distance from the theatre, whence they are fetched in enormous carts. The iron curtain, a *sine qua non* in Vienna theatres since the burning of the Ring Theatre, is as clever a contrivance as was ever invented. It is double, and if let down gently falls without the slightest noise, but if the handles are turned with a jerk it fills itself with water. Of course the firemen are acquainted with its qualities, but even if they were not, there is every probability that in case of a fire it would not be handled gently. The curtain is painted as a wrought-iron gate, through which Vienna is visible. The large curtain is the work of the painter Fua, and represents the human passions and likings as they are represented on the stage. For use between the acts an old curtain of the Burg was widened and renovated. It is by Fuger, and represents Apollo and the Muses.

The actors have every cause to be grateful to the builders of the new theatre. Their dressing-rooms are lofty, bright, close

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This work has the favourable recommendation of the President and Members of the Council of the Royal Institute of British Architects, and a large number of other eminent Architects. Full particulars of

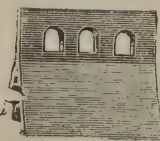
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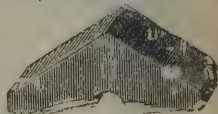
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to the stage, and furnished with every comfort that could be placed in a limited space. Polished maplewood is the chief feature; and mirrors, wardrobes, cupboards, paint-drawers, are all fixed in the walls and open in unexpected corners. Yet there are old *habitués*, men closely connected with the theatre and its actors, who say they will not play so well in the new as they did in the old house, who think the halo which shone so brightly over the poky old Burg in the Michaelerplatz will disappear for ever under the dust of the stones as they are pulled down one by one. The new Burg Theatre is the work of Baron Hasenauer, who drew the plans for it as long as twenty years ago, some of them together with Semper, who is dead now, and who designed the museums, the new Burg Palace, the theatre, and many more monuments of architecture for his younger partner Hasenauer to complete. Among the able staff of architects and engineers who aid him in the arduous task is Victor von Weymann, who, when he speaks of the opening of the new Burg Theatre—not a stone of which has been fixed in its place except under his vigilant eye—speaks like a mother who is about to see her firstborn married and lost to her for ever.

#### MINING INDUSTRY IN BRITAIN.

ON Tuesday Professor Arnold Lupton delivered a lecture at the Yorkshire College, Leeds. He began by stating that coal mining was by far the most important branch of mining in Great Britain, and also the most recent. Five hundred years ago coal mining was hardly known. At the present time, out of the total mineral production of the United Kingdom, valued at, say, 60,000,000*l.*, 40,000,000*l.* was in coal. Metal mining was more ancient than the earliest records. The mining of metals was mentioned in the Book of Job, but there was no reference to coal mining. Great Britain was endowed with a store of mineral wealth which embraced nearly all the metals and minerals for which the earth was mined. There were a few notable exceptions, such as quicksilver, platinum, diamonds and rubies, and other precious stones. But gold, silver, tin, copper, lead, arsenic, iron, manganese, coal, cannel, jet, gypsum, salt, slate, freestone, fire-clay, and many other minerals were found and mined. Mining could be done on the whole as cheaply in Great Britain as in any other country, because we possessed the skilled labour, the fuel, the water power, and the machinery that were necessary. Gold was mined in Wales in

the time of the Romans, and at intervals since then. Within the last thirty years a good deal of gold had been got from quartz veins in the neighbourhood of Dolgelly, upwards of 40,000*l.* worth having been got out of one mine, and there had been periods of excitement and speculation, but all the mines were closed again. Quite recently Mr. Pritchard Morgan had reopened a mine in the Mawdach river, and had found a vein which undoubtedly contained some very rich ore. Describing the mines at Northwich, he explained that they were worked like mines of thick coal, but had the advantage of a very good roof. Brine was pumped from abandoned salt mines, causing eventually great subsidence of the surface and destruction of buildings; but the people of the salt districts well understood that "their prosperity is founded on the abstraction of their foundations."

#### THE THEATRE ROYAL, DUNDEE.

THE old Theatre Royal at Dundee was destroyed by fire on Saturday. It had been used as a music-hall for several years, and was undergoing extensive renovation preparatory to reopening this week. The fire broke out shortly before 2 A.M., and raged fiercely until four o'clock, by which time the building was entirely gutted. The houses immediately adjoining the theatre are thickly tenanted, and widespread alarm was caused among the occupants. The total damage done is calculated to amount to about 6,000*l.* This theatre was long the principal house in a city which appears to have been distinguished in very early times by its hospitable reception of companies of actors. Though partly reconstructed about fifty years since, the structure was erected in the first decade of the present century, and was a commodious house for a country theatre of the time, being capable of seating 1,400 persons. Mr. Samuel Bell, architect, prepared the plans in 1808.

#### THE SANITARY INSTITUTE.

THE first meeting of the Council of this Society, which has recently been incorporated, was held at the Parkes Museum on Friday. Sir Douglas Galton, K.C.B., F.R.S., was unanimously appointed chairman of the Council, and Mr. G. J. Symons, F.R.S., the registrar. The institute is founded to carry on the objects of the Amalgamated Sanitary Institute of Great Britain and the Parkes Museum, and it was decided to hold the insti-

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#### TESTIMONIALS.

9 Victoria Chambers, Westminster, S.W.  
SIR.—I have much pleasure in testifying to the efficiency of your patent warm-air fire-grate. It has been very successful, and given every satisfaction where I have used it.  
Yours, &c., JAMES WEIR, F.R.I.B.A.,  
To Mr. Grundy, 6 John Street, Bedford Row, W.C.

From ARTHUR W. BLONFIELD, M.A., Esq., Architect,  
24 Montagu Square, London, W.

Mr. Grundy, of Tyldesley, near Manchester, has carried out his plan of warming in several churches built under my direction, and in each case it answers remarkably well, and has given great satisfaction.

From Professor W. B. ROBERTSON, M.D., West Dulwich, S.E.,  
September 1, 1887.

DEAR MR. GRUNDY.—I value your apparatus very highly indeed. I regard it as the greatest comfort I have in this house.

From Rev. A. FERGUSON SMYLY, Dean of Derry, The Deanery,  
Derry, September 16, 1887.

DEAR SIR.—I cannot refuse to give you a few words of commendation as to the apparatus you supplied for heating Derry Cathedral. Not only is the air of the Cathedral quite pure and pleasant to those attending the services, as it must be from the fact that most of the air heated is taken from the outside, but I find the building itself is so much benefited, as formerly it was damp and smelt damp, but now it is very dry and free from any musty smell. I find that, although the Cathedral is now much larger, the cost of firing is much less.

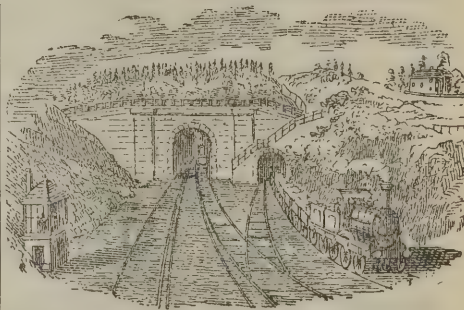
To Mr. John Grundy, 30 Duncan Terrace, City Road, London.

From Hon. and Rev. G. G. C. TALBOT, M.A., Withington,  
Cheltenham.

DEAR SIR.—You will be gratified to hear that the school is completely warmed by your new grate. It is the most economical and efficient that I have ever seen.

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tute's first examination for local surveyors and inspectors of nuisances on November 8 and 9. A programme of lectures for the winter session is in course of preparation. A letter was read from the Charity Commissioners saying that they considered that the new institute was likely to prove a powerful means for the diffusion of sanitary knowledge, and promising to grant facilities to the institute to deliver lectures in the various buildings which the commissioners proposed to establish in different parts of London.

#### CHEADLE AND GATLEY MAIN DRAINAGE.

THE scheme of Mr. J. B. Everard, M.Inst.C.E., of Leicester, has been placed first in the competition for the main drainage of Cheadle and Gatley, near Manchester; that of Messrs. Brierly & Holt, of Manchester and Blackburn, second; and that of Messrs. Landsborough & Preston, of Bradford, third. We understand that Mr. James Mansergh, sanitary engineer of London, has been called in by the Local Board to advise them in making the award. The amount of the estimate for the successful scheme was 23,300*l*.

#### TEACHING OF DESIGN FOR INDUSTRIAL WORKS.

AN address in connection with art teaching in relation to technology, entitled "Pictorial and Decorative Art," was given by Mr. C. Stephenson at the opening of the general art classes of the Yorkshire College, Leeds, on Friday evening last.

Mr. Stephenson began by saying that the difference between pictorial and decorative treatments was not sufficiently understood. Decorative designs were constantly criticised by the principles of pictorial painting, even by people who had a fair knowledge of pictures. But what was much worse, one often heard works of art criticised according to what people called their "fancy." This was very unfair to the artist. Pictures should be criticised according to certain principles just as much as other things, and we should educate ourselves by a right study of these principles, in order that we might appreciate what was acknowledged to be good in art. It was to the Middle Ages that we must look for the finest gems of decorative art, when were built those fine churches and palaces, enriched with matchless stained-glass windows, and adorned with splendid carvings in wood and stone, the like of which had

never since been equalled. Easel pictures—those that were framed and hung on our walls—were then almost unknown, the nearest approach being the altar pictures. In the present day everything was turned out by piece-work. The artist and decorator or designer were now two different persons. Easel pictures were the outcome of modern ways of living. In the olden times our forefathers who were in a position to build houses of their own could count on living in them for the rest of their lifetime. Consequently they decorated them with paintings let in as panels in the walls. Social changes now took place so rapidly that paintings were placed in frames and made portable. To produce a work of art the qualities of mind required were two—the power of imitation and the power of design. Some artists had the faculty of design more strongly developed than that of imitation, and would naturally devote themselves to decorative and imaginative work. He should define a picture as a rendering by means of colours, in black and white or relief, of some object without any reference to where the picture would be placed, or to what its surroundings would be. It was usually placed in a frame to isolate it from its surroundings, and it was in this isolation that the chief difference lay between the pictorial and decorative treatments. A decorative work might be a representation of the same object, executed in the same materials; but it was usually rendered in a more or less conventional manner, and should in all cases be executed with a regard to the surroundings it would have in order that everything might be in perfect harmony. It was in our own homes where we could best indulge our taste for art, and it was desirable that something should be known about ornamental art as applied to domestic decoration. It was not the designer's aim to give a realistic imitation of any object; that belonged to pictorial art. An exact imitation was, he believed, out of place. Not long ago it was a common thing to see carpets, the designs of which were composed of huge bouquets of flowers in gaudy colours. The object of the designer seemed to have been to rival the artist who painted on paper or canvas. But however much he seemed to imitate nature it was a bad attempt on account of the coarse material he had to deal with. It was better for the designer to confine himself to flat conventional forms, without light and shade. Then, again, there was fitness in things. The idea of walking on a number of bouquets of flowers was not a pleasant one. In recent years carpet manufacturers had been beneficially influenced by the large importations of Persian carpets. In these the sense of propriety was never outraged. In wall-papers again, flatness was desirable, though not to such

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a great extent as in carpets. In all cases the colour should be quiet and subdued, because the wall-paper was only intended as a background for the other objects in the room, and should therefore be retiring. The interest in a design should be in proportion to ingenuity and artistic feeling it displayed, and not in its imitation of nature. Pictures might be divided into three classes—the idealistic, the historical, and the realistic. The idealist painter was akin to the decorative painter. He went to nature for his subjects, and beautified and enriched them by his imagination. In the historical picture one expected to see an event portrayed with all attendant details, and with attention to truth. It must also be presented with force and dramatic feeling. In the realistic school, the pictures were little more than transcripts from nature. The subjects chosen were usually those of everyday life, and the artist did not attempt to idealise his models, but copied them as he found them. He recommended them to study the collection of pictures at the Leeds New Art Gallery. They would also find in the gallery a choice collection of decorative works, mostly from the South Kensington Museum.

#### HARVEST FESTIVAL AT THE ALEXANDRA PALACE.

THURSDAY, the 18th inst., promises to be one of the most brilliant days which has been witnessed at the Alexandra Palace during the season. The general manager is arranging an Harvest Festival at the Alexandra Palace which will eclipse all the Bank Holiday programmes, and offer a day's treat such as can be experienced at no other place of entertainment in the Metropolis. The most elaborate preparations are being made to render the enjoyment of those who attend complete. We understand that there will be harvest decorations in the Central Hall, with trophies of corn, fruit, flowers, and vegetables. The small stage of the Central Hall will be the scene of two of the best variety entertainments that have been given at the Palace, many celebrated artistes having been secured for this occasion. We believe that there will also be arranged a grand ballad concert, to be given in the theatre, and at which a number of the leading vocalists who have appeared at the Palace grand concerts will give their services. The concert will take place at 5.30 P.M., and terminate at 7.30 P.M., after which Messrs. Pain & Son's grand representation of the Last Days of Pompeii—which has been already witnessed by over a million of people—will be produced on a

scale of unexampled grandeur, and will be followed by a magnificent display of fireworks, concluding what will undoubtedly prove to be the best day's enjoyment ever organised at the Palace. Besides the special arrangements for the day, there will be the attractions of the International Circus, the Picture Galleries, and the Life-saving Exhibition. Many new appliances for saving life from loss by shipwreck or fire have now been added to this exhibition, and the whole is now rearranged in the enormous hall known as the bazaar. An inspection of this exhibition alone amply repays a visit to the Alexandra Palace, for there is now an excellent display of life-saving apparatus, from the ancient appliances of our forefathers to the most advanced scientific ones of the present day. Of all the exhibitions of the present year, none are more interesting and valuable than this one, whether the visitor is a seeker of pleasure, whether interested in humane work, or animated by a desire for instruction, and it may well be borne in mind that the object of bringing these inventions together is to promote the saving of human life from loss either by drowning or being burnt.

#### EARLY SMITH'S WORK.

A LETTER appears in the *Times* of the 6th inst., in which the writer says:—When many years ago I used to go sketching about this fine old church (St. Albans Cathedral), there was a door in the south transept, covered with ironwork of early date and beautiful design, which was a favourite subject among architectural students. Last Bank holiday I revisited the abbey church, and noticed that the old door was gone and a new plain one of oak in its place. Afterwards, in walking round outside the south wall of the nave, I observed lying among some builders' rubbish a fragment of an old door, which, from the markings on it and remains of pieces of rusty iron still clinging to nails, I at once recognised as a piece of the famous door of the transept, which used to be regarded as one of the "choice bits" in the church.

#### DUBLIN SCIENCE AND ART MUSEUM AND LIBRARY.

THE outside of the museum is now, the *Irish Times* says, completely finished, the materials of which it is composed being Mountcharles cut stone, with dressings of granite from the Bessbrook quarries, as well as from Dublin and Wicklow, and

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the effect is highly pleasing, viewed from the courtyard of Leinster House. A number of men are still engaged working at the annexe, which will shortly be finished. Inside of the museum all the plastering work of the building has been completed. The interior of the rotunda dome contains enriched pilasters, caps, and bases, and there is a gallery supported on marble columns, with bases of Bath stone, carvers being at present engaged on a marble hand rail at this point. All the ground floor is finished with mosaic tiles in figured designs. The principal stairs leading to the first floor are of Portland stone, and on these stairs the first landing is supported on marble columns with Bath stone arch. The first and second floors are laid in oak, and the carved walnut doors are fine examples of artistic skill. Messrs. Musgrave & Co., of Belfast, have supplied the heating apparatus for the museum, and for the library a similar service has been rendered by Messrs. Hodges & Son, of Dublin.

The chief Irish marbles used in the buildings are black Kilkenny, red Midleton, red Little Island, green Lisslaughter (County Galway), Moneen, Glenowen, Rosksa, Mitchelstown, Erne fossil, and Bessbrook, and there are several examples of foreign marbles from Brescia, Sicily, Verona, Genoa, Sienna, and Belgium, the latter being a handsome black-and-gold pattern. Some Derbyshire spar is also used. Messrs. Doolin & Robinson, of Belfast, executed the marblework in a superior way, and the granite columns have been extremely well done by Messrs. Flynn, of Bessbrook. Irish firms have got a considerable share of the fittings required at the museum and library, though a good many contracts were placed at the other side of the Channel. The steel decking floors of the library were manufactured by Messrs. Lindsay & Co., of Paddington, London, and the pavilion floors were made by Messrs. Homan & Rogers, of Manchester, while the central court gallery floors are the work of Messrs. Dennett & Ingle, of London. The curved girders of the long galleries have, however, been executed by Messrs. Stephens & Co., of Dublin, who have also done the ironwork of the domes, while Messrs. Young & Co., of the Eccleston Works, London, have furnished the ironwork of the central court, and the mosaic flooring is by Messrs. Oppenheim, of Manchester. Messrs. De Groot, Sharp & Emery, of Dublin, have executed some splendid work in stone-carving, and altogether the contracts entrusted to Irish firms have been carried out in the most admirable manner, competing creditably and successfully with the best work of the same kind done in any part of the world.

### ANTIQUE CLOCKS.

AN interesting collection has been bequeathed to the British Museum by Mr. Octavius Morgan, who since 1830 had been a Fellow of the Society of Antiquaries. For fifty years Mr. Morgan continued to increase and improve his collection, which included clocks and sundials as well as watches, and it may fairly claim to illustrate all the varieties of mechanism which many generations of inventive craftsmen have applied to these useful instruments. These are now exhibited with the other objects of the same kind in the Mediæval room. Of the fifty clocks in the collection the most important, as it is the largest and most elaborate, is the complicated instrument made in 1589 by Isaac Habrecht, one of the two ingenious brothers who made the famous clock at Strasburg. Although it is only from 4 to 5 feet in height, and can bear no comparison as to size with its gigantic prototype, yet in detail many of the parts betray the same hand. The general design is the same as that of the left tower of the Strasburg clock, and on the sides of both are figures of the three Fates, Clotho, Lachesis, and Atropos, and both are surmounted by a figure of the cock of St. Peter, which at the stroke of the hour flaps its wings and crows. The quarters are struck by four figures representing the ages of man, and the hour by a figure of Death. On a lower balcony is a seated figure of the Virgin and Child, before whom passes a circle of angels, who, as they are set in movement by the striking of the clock, are caused to make an obeisance in front of the Virgin. Below this the gods of the days of the week perform their circuit, each driving in a chariot, while two dials on the lower stages fulfil the more useful functions of indicating the hour, the phases of the moon, the feasts of the Church, &c. The case is of gilt copper, with well-engraved figures and ornamental designs, perhaps by Tobias Stimmer, who was employed to decorate the original clock at Strasburg. The history of this clever piece of mechanism is somewhat curious, though it rests upon slender foundations. It is stated that Pope Sixtus V. was so pleased with the Strasburg clock that he ordered Habrecht to make one of the same kind. This one was made, and remained at the Vatican for 200 years. Its next appearance was in Holland, where it was in the possession of the King; from Holland it came to London, and was exhibited about 1850. A pamphlet was printed giving a description of the clock, and recounting this somewhat apocryphal history. After some vicissitudes it came into Mr. Morgan's possession a year or two later. Many of the other clocks in

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### TESTIMONIALS.

21 New Bridge Street, London, E.C.: February 23, 1886.  
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J. WM. STEVENS, Architect and Surveyor.

75 Newman Street, Oxford Street, W.: Feb. 15, 1887.  
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the collection are of unusual merit, and illustrate the endless variety of design which characterises this branch of industry. Mr. Morgan paid considerable attention to the mechanism of clocks and watches, and he gave an account of his discoveries in this direction in the "Archæologia" for 1848. The outer cases, both of the clocks and the watches, are often deserving of as much attention as the internal mechanism. The common form of the sixteenth century—a square tower of metal, closed on all four sides—admitted of the most lavish decoration, and much of the work is of quite as high a quality as the silversmith's work of the same time, and, in fact, in some instances proceeded from the same workshops in Augsburg or Nuremberg. The series of sun-dials, which accompanies Mr. Morgan's other collections, forms an interesting addition to those already in the museum—no inconsiderable number. They are for the most part of German manufacture.

### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

13950. Joseph Addey Fawcett, for "A new or improved key, handle, or crutch for taps, valves, vents, spills, &c." September 28, 1888.

14001. William Bradley, for "Improvements in the construction of cocks or taps." September 29, 1888.

14006. James Marshall, for "Improved bow or swinging crescent, for automatically operating crane buckets." Sept. 29, 1888.

14014. William de Lacy-Perry, for "A simplex burglar-resisting window-fastening." September 29, 1888.

14069. James More, for "Improvements in the construction of fire-extinguishing apparatus, and in vessels for generating and retaining carbonic acid gas." October 1, 1888.

14119. Francis Elliott Stuart, for "Saving life from fire, the domestic fire-escape." October 1, 1888.

14137. Thomas E. Bickle, for "A safety-catch for lifts, hoists, cages, skips, &c." October 2, 1888.

14138. Henry Vincent White for "Repairing and forming the surface of roads and streets for a permanent way." October 2, 1888.

14146. Francis Joseph James Gibbons, for "An improvement in espagnolette bolts for fastening casements, applicable also to other analogous purposes." October 2, 1888.

14156. William Young Hardie, for "Improvements in the precipitation and the mechanical, chemical, pneumatic, and electric treatment of town sewage and the utilisation of the solids therein, as well as the preparing from town refuse a deodorising and purifying powder, which is also applicable for other purposes." October 2, 1888.

14158. David Clohesy, for "Undercutting or dovetailing in any size wood, stone, iron, steel, or any other substance into which another is required to be let, fastened, or permanently inserted." October 2, 1888.

14159. Norris Rhodes Epworth, for "Improvements in the construction of shop-fronts." (Complete specification.) October 2, 1888.

14179. James George Killey, for "An apparatus for inspecting the interiors of pipe-sewers, &c." October 2, 1888.

14262. James Reid, John Peacock, and Duncan Walker, for "Improvements in and relating to the valves and valve-fittings of baths, sinks, lavatory basins, and the like." October 4, 1888.

14286. John W. Ransome, for "Improvements in the manufacture of artificial stone and concrete blocks." October 4, 1888.

14293. Emma Osborne, for "Automatic household fire-escape steps and ladders." October 4, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

11250. Thomas Carpenter Dowd, for "Improvements in casement-fasteners and lift-catches." August 3, 1888.

11466. Charles Southon, jun., for "An improved chimney-cowl." October 8, 1888.

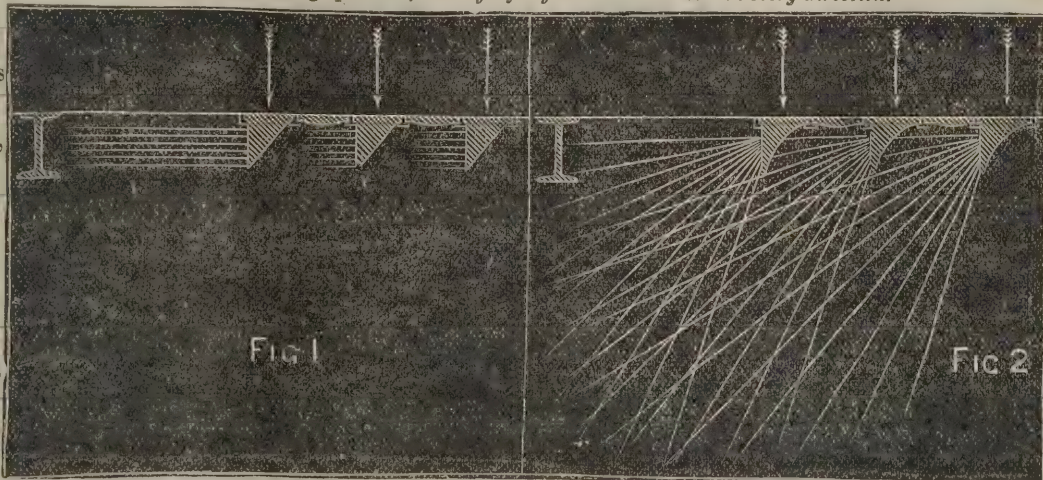
12408. John R. B. Rashleigh, for "Improvements in means or devices for facilitating the insertion of nails, screws, and other fastenings into brickwork, concrete, or other masonry, and for insuring the retention of same therein." August 28, 1888.

12675. Ferdinand Dick Butler, for "An elevating table or hoist, applicable also as a builder's or decorator's scaffolding or the like." September 3, 1888.

## Wilson's Patent Dioptrical Pavement Lights.

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Fig. 1 shows how the ordinary prism or semi-prism, by receiving the rays on a plane reflecting surface, throws them forward at one angle only, in parallel lines close to the ceiling.

Fig. 2 represents the Patent Dioptrical Lens, and shows by comparison how the rays of light, striking on the curved inner surface, are reflected forward through the face of the lens in every direction, filling the whole angle of 90°, thus illuminating the apartment from floor to ceiling and from wall to wall.

From the above diagram it will be seen wherein consists the advantages claimed for Wilson's Patent Lenses. The objection to the semi-prism is that it reflects the light, as shown in Fig. 1, at such an angle as to be of little use, and more especially if the line of the ceiling is below the line of the pavement; then the value of the semi-prism as a light projector is entirely lost.

It will be seen also, on reference to the above diagrams, in Fig. 1 that the first row of semi-prisms obstructs the rays of light from each succeeding row, whereas in Fig. 2 the bulk of the rays of light are projected at such angles as to pass unobstructed into the room.

The correctness of these illustrations can be practically demonstrated to any architect desirous of testing them.

PRICE LISTS AND ESTIMATES ON APPLICATION TO

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12676. De Fonblanque Pennefather, for "Improvements in apparatus for ventilating rooms, chambers, buildings, and the like." September 3, 1888.

12701. Oliver Imray, for "An appliance to window-sashes to prevent shake." September 3, 1888.

12729. George Heinrich Otto Böklen, for "Improvements in metallic roofing." September 4, 1888.

13096. John Edward Rogers, for "Improvements in flushing cisterns or waste water preventers." September 11, 1888.

13185. James King, for "Improvements in the construction of metal cisterns, tanks, and other such vessels." September 12, 1888.

13432. John M. Siddell, for "Improvements in filling, or devices to be used in connection with outside blinds for shop windows and for analogous purposes." September 17, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

14068. Jonathan Hurn Faulkner, for "Improvements in mechanism for allowing locks, more particularly those of gates or doors, to be operated on the insertion of coins, and for securing, when applied to waterclosets, the closing of the door after each payment; also applicable to automatic sale apparatus and the like." October 17, 1887.

15996. William R. Lake, for "Improvements in devices for preventing the slamming of doors." (Henry E. Russell, United States.) November 21, 1887.

16262. Francis Napier Seyde, for "Improvements in metallic lathing or backing for plaster or cement partitions and ceilings." November 26, 1887.

16375. Alfred Dongill, for "Improvements in baths or combined hot-water tank or cistern and bath." November 29, 1887.

16507. Frederick Howard Collins, for "Improved indicator for door fastenings." December 1, 1887.

574. William Joseph Balk, for "Improvements in street gullies and traps." January 13, 1888.

3197. William Morier, for "An improvement in the manufacture of whitewash and distemper brushes." March 2, 1888.

10706. George Evans, for "Improvements in construction of window frames and hanging the sashes." July 24, 1888.

#### PATENTS SEALED, OCTOBER 5, 1888.

11044. Benjamin Waldron, for "Improvements in boxes for stopcocks and other analogous purposes." August 12, 1887.

12362. Proctor Barrett, for "Improvements in means applicable for the counterbalancing of window sashes." September 13, 1887.

12872. Mark Henry Blanchard, for "Improvements in bricks for wells and such like purposes." September 22, 1887.

8245. George Anslow, for "Improvements in locks and latches for house doors." June 6, 1888.

#### ABRIDGMENTS.

"Certain improvements in spring catches for doors, &c." No. 14776. 1887. S. Timmins & S. Hill, 23 Great Hampton Street, Birmingham.

*Claim I.*—Making the bolts of spring catches or fasteners for doors, gates, French windows, or the like capable of an outward swinging motion as described, in combination with the usual sliding motion, so that the bolt will automatically pull the door, &c., into its closed position after it has been opened through a short space, substantially as set forth.

"Improvements in the manufacture of blue bricks, tiles, and fire-bricks, and the like." No. 17967. 1887. Benj. Gregory, Carlton Hill, Carlton, Notts.

*Claim I.*—The use of iron ore to blue the blue bricks, tiles, and the like.

*Claim II.*—To make the blue bricks, tiles, and fire-bricks without using "blue clay" or "fire brick."

"Improvements in arrangements and apparatus for ventilating halls, &c." No. 5931. 1888. D. J. Hoey, 196 St. Vincent Street, Glasgow.

*Claim I.*—In arrangements or apparatus for ventilating halls, rooms, &c., providing dado spaces or equivalent reservoirs with tops, wire gauze, or perforated sheet metal, and with several inlets for the purpose of distributing the entering air over a considerable extent of space along the walls, as hereinbefore described.

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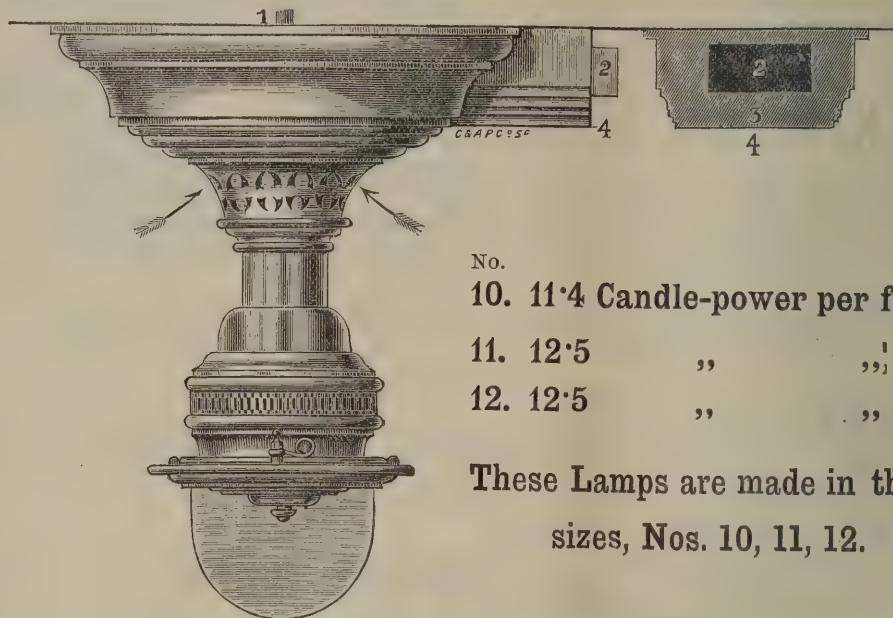
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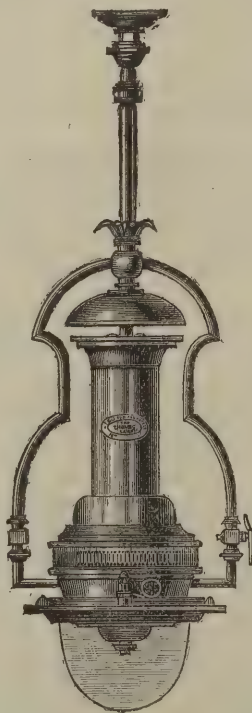
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# The Architect.

## THE WEEK.

MR. THOMSON offered an opportune suggestion at the meeting of the Glasgow Institute of Architects on Tuesday when he proposed that a part of the surplus of the Glasgow Exhibition should be assigned for founding a chair of architecture in the Glasgow University. When he said that the success of the exhibition was in a great measure owing to the building, Mr. THOMSON was expressing a general belief; but, on the other hand, the authorities may point out that the designer of the building, the late JAMES SELLARS, was not taught in a university, and we believe at no time was he a pupil in an architect's office. He attained his skill in design and knowledge of ornament in the local art school, and it may be said that the same route is open to every youngster. Although Glasgow has not a professor of architecture, it is not lacking in able architects. However, benefits would follow from the establishment of a chair of architecture to others besides professional students, and the executive will do well to consider Mr. THOMSON's suggestion. One of the most interesting items in the report read at the meeting related to the travelling studentship, which was awarded in last December to Mr. W. J. ANDERSON. The Council say that Mr. ANDERSON, in fulfilment of the conditions of competition, made a sketching tour in the spring and early summer of the year, and spent fully twelve months in Italy. On his return he submitted the sketches and drawings which he had made, together with a memoir descriptive of his travels. The trustees had every reason to be satisfied with the competition and its results. At the election which followed the meeting Mr. GORDON was elected President and Mr. LEIPER Vice-President.

THE list of subjects for papers issued by the Institution of Civil Engineers suggests the widening of the profession. Not satisfied with what has been done already, the first subject proposed is "The Utilisation of Unused Sources of Power in Nature." New powers suggest new causes of mischief, and, accordingly, the third subject proposed is "The Influence of Sea Water upon Portland Cement, Mortar, and Concrete," which will allow of an opportunity to discuss the difficulties which have of late put the harbour authorities in Aberdeen to much expense. Another subject which is useful is "Standard Specifications for the Materials Used in the Construction of Engineering Works;" a paper on it may lead to uniformity of practice. Uniformity is no less needed in architectural specifications, but apparently a century will elapse before the Institution is awakened to recognise the importance of subjects relating to practice. The Council of the Institution also propose an investigation of "The Working Strength of Iron and Steel as affected by the amplitude, the frequency, and the time-rate of the stress variations," thus indicating that our knowledge of the strength of beams is not complete. Another subject which relates to architects is the one described as "The Effect of Wind upon Structures, as influenced by their superficial area; the form or position of the exposed surfaces; the shelter of adjacent bodies; and the dynamic action of sudden gusts." They have also an interest in the thirty-seventh subject, which is "The best combined System of Warming, Ventilating, and Lighting Large Buildings." It does not follow that the only use of the suggestions for papers is for members who intend to work upon the subjects. The list awakens thought, and enables many to recall all they know about a subject, and to discover how much they have to learn.

THE Special Committee on the work of the Works Department of the London School Board have an onerous task before them, if they consider all the allegations which are brought forward. For instance, one letter-writer says he can show how a surveyor of the School Board invariably received three payments upon the large amounts

included in the estimates as provisional sums. This operation, it appears, was conducted by the following strategy:—1st. His commission included a percentage upon provisional accounts, and was paid from the first instalment received by the contractor. 2nd. When adjusting the accounts, a deduction was made of all the provisions and  $2\frac{1}{2}$  per cent. was claimed upon the deduction. 3rd. Another charge was made upon the net amount expended out of the provisions. In this way the surveyor is said to have netted 50 per cent. more than other surveyors. It is also charged against him that, instead of taking out his quantities, he let them on the sweating system. It is easy enough to make rash statements like the foregoing at a safe distance, but it is hardly probable that the author of the indictment will have the courage to appear and uphold his words.

THE Edinburgh Town Council have introduced the plan of dealing with sculptors as if they were architects. It appears that Prince's Street is to be adorned by statues of WALLACE and BRUCE, which are to be 14 feet in height, standing on pedestals 15 feet high. Sculptors are accordingly invited to send in models of the figures 3 feet 6 inches high, or one-fourth the scale of the contemplated statues. The prizes are to range from 20*l.* to 5*l.* It is stipulated that the statues and pedestals are to be supplied and erected for the sum of 2,750*l.*, and that the bronze is to be not less than  $\frac{3}{8}$  inch thick at the thinnest part. Here is what a competitor says of the bargain:—"It is found that the bronze casting by a good firm will cost 1,400*l.* for the statues. The pedestals will cost about 600*l.*; the foundation say 100*l.*, but as the ground is forced one may drop several times that amount in the hole; framework material and casting in plaster for the models, 150*l.*; transits and cases, 100*l.*; rent and taxes, 100*l.*; assistance and incidental expenses, say 100*l.* These are close figures of certain expenditure, which may easily be exceeded, and the total is 2,550*l.*, leaving a balance of 200*l.* for the artistic work and the full-size 14 feet models, and the risk, care, and attention of the work for a period of at least eighteen months." We trust the northern sculptors will have the shrewdness to investigate the subject before they enter on the competition. It is true that some of the items appear rather high, such as 600*l.* for two pedestals, but enough remains to reveal the hard conditions offered by the Council.

THE jury appointed to examine the second series of designs submitted in the competition for the façade of Milan Cathedral have awarded the first prize of 40,000 francs to M. BRENTANO, of Milan, who is to be entrusted with the execution of the works. Prizes of 5,000 francs each are obtained by Messrs. DEPERTHES, of Paris; BELTRAMI, of Milan; and NORDIO, of Trieste. The winners of 3,000 francs are Messrs. DICK, of Vienna; WEBER, of Vienna; MORETTI, of Milan; and LOCATI, of Milan. The prizes of 2,000 francs are given to Messrs. DAVID BRADE, of Kendal; BECKER, of Mayence; HARTEL ET NECKELMANN, of Leipzig; CESA BIANCHI, of Milan; AZZOLINI, of Bologna; and FERRARIO, of Milan.

M. FEYEN-PERRIN, who died a few days ago, was one of the painters who most felt the influence of MILLET. He did not attempt to impart the sadness of MILLET to all his works, but he tried to suggest that he possessed equal sympathy for labourers. Like MILLET, he was a pupil of DELAROCHE, and began with historical painting, but the success of his *Grève* and *Vanneuse* revealed to him his true powers. Of the latter work he made several replicas. He was one of the painters who were attracted to the shores of France, and the Government showed discrimination when his *Retour de la pêche aux huîtres* was selected for the Luxembourg. He was an excellent portraitist. At one time M. FEYEN-PERRIN was wealthy, but he lost all his savings through an unwise speculation. His school in Paris was much frequented by ladies.



## THE HOLY PLACES OF JERUSALEM.\*

IT is not difficult to understand the reasons for the uncertainty of our knowledge about the ancient topography of Jerusalem and the positions of the Holy Places. If the old landmarks were forgotten it was owing as much to the progress of Christianity as to the destruction of the city under TITUS.

As Christianity had its origin in Jerusalem, it might be supposed by one of the early disciples that the city was to become a veritable "centre of the world," and that the visions of the prophets were to be realised in the multitudes of strangers from the ends of the earth who were to enter through its gates. We may imagine that many among the first converts to Christianity were sorely tried in their faith when they discovered that Jerusalem was overthrown. If the statement of TACITUS can be accepted as credible, one of the objects sought by TITUS in the demolition of the temple was to give a final blow to Christianity as well as to Judaism. It was not supposed that either of the sects could survive when it was found that no battalions from above came to resist the Romans. The story seems confirmed by an historian of the second century, who describes the efforts of TITUS to dispel the terrors of the soldiers who were ordered to enter the temple. The thoroughness of his destruction, indeed, suggests that TITUS was thinking of other enemies besides those in the city. When he left Jerusalem it was a heap of ruins, over which the tenth legion was placed in order to prevent all attempts at rebuilding by Jews from distant regions. Under the circumstances, there was no likelihood that any care would be taken to preserve a record of the places which were hallowed by the sufferings of CHRIST.

During the period which followed there were influences at work through which Jerusalem lost all claim to the supremacy which appeared to belong to it. M. RENAN, when lecturing in London, argued that, if the Temple of Jerusalem had survived, the development of Christianity must have been arrested; it would be recognised as the holiest spot in the world, and whoever presided in it would hold the highest place in the Church. It is maintained, however, that under those conditions the ritual of Judaism was destined to prevail, and with it a hierarchy composed of one family. In the course of events the Church of Jerusalem declined, and more than a century appears to have elapsed in which there is no trace of a pilgrim from Europe to the city.

After CONSTANTINE had given freedom to the Christians of the empire, there was evidently a desire to take part in pilgrimages to the Holy City. In A.D. 333 an itinerary was composed for pilgrims (including Britons and Indians) between Bordeaux and Jerusalem. GIBBON relates with a sneer that for the visitors the clergy "fixed by unquestionable tradition the scene of each memorable event." But, to satisfy people of a later age, something more than tradition is sought. Much has been done by the Palestine Exploration Fund in increasing our knowledge of what still exists above and below the soil of Jerusalem; yet in the most important places nothing has been discovered which will enable us to supplant the old traditions by something like certainty. All the exploration has failed hitherto to determine the scene of the Crucifixion. We have no more than a substitution of new guesses for some which have age in their favour.

The interesting book by Mr. HAYTER LEWIS suggests the difficulty of the problem. As becomes an architect, the author does not seek to evade difficulties, or to throw dust in the eyes of his readers. Setting aside legends, he depends upon a close examination of the remains, and where the problem to be determined is one of the age of a building, Mr. HAYTER LEWIS endeavours to discover evidence by a comparison of the work in Jerusalem with what is found elsewhere. It would be vain to say that in every case the writer proves his point, for a good many years must pass before there is an agreement on anything relating to Jerusalem; but every one will recognise his skill in marshalling proofs, and the love of truth which inspires the book.

\* *The Holy Places of Jerusalem.* By T. Hayter Lewis, F.S.A. London: John Murray.

The first question suggested by the volume is the difficulty of determining the lines of the walls of Jerusalem. A plan showing those laid down by various inquirers might be taken as a sample of what follows. FERGUSON'S "first wall" overlaps a great part of the "second wall" of WARREN, CONDER, WILLIAMS, and others; on the Sakhrab, CONDER'S line is outside FERGUSON'S; and the existing wall, which is mainly the "second" of FERGUSON, is the third of WARREN. The lines are of much importance in relation to the position of the Holy Sepulchre and Calvary. Excavations are in progress, and every one is familiar with the sketch of the lofty wall on the cover of the *Quarterly Statement*, which was about 150 feet in height. Mr. HAYTER LEWIS suggests its greatness, by asking us "to imagine a massive wall of stone some 30 feet higher than our Duke of YORK'S column."

The Haram Area, or Noble Sanctuary, which was supported on three sides by the wall, forms the subject of a large part of the book. It was on that site, according to some authorities, the Temple of Jerusalem was erected, and on the spot where the Dome of the Rock, or Mosque of Omar, now stands. The traditions of the Jews correspond with that view. The late Mr. FERGUSON maintained that the building was the Church of the Holy Sepulchre, erected by CONSTANTINE, and that the scene of the Crucifixion was about 150 yards from the north-west angle of the building. According to Mr. FERGUSON, the building is essentially a tomb-house, and in beauty surpasses similar works between Rome and Delhi. It could not be a mosque, he said, as the chief entrance is on the south, and the worshipper would have to turn his back on Mecca. The dome is admittedly Mohammedan, but the ceilings of the side aisles are Roman, and, architecturally, says Mr. FERGUSON, the building belongs to the age of CONSTANTINE.

Mr. HAYTER LEWIS takes up all Mr. FERGUSON'S statements in turn and refutes them. In the first place it is shown that the building is not a mosque, but "an oratory built over the Rock to protect the pilgrims who prayed there," and is comparable with the Dome of the Books in the Damascus mosque or the fountain in the mosque of Amru at Cairo. It is suggested that the existing solid walls of the octagon did not form part of the original design, and, in that case, the building would consist of two arched open colonnades. This arrangement is suggested by a description of the ninth century, which speaks of the structure as hung round with curtains of brocade. It is supposed by Dr. CHAPLIN that the Arabs did not anticipate so much coldness in Jerusalem, or the drifting of the snow into the shrine, and the wall was made as a protection. Mr. HAYTER LEWIS considers the subject of the details of the capitals and columns, and shows how they "were reconstructions of older buildings of various dates which had been partially destroyed, and whose materials had been put together in after times, together with others worked at the time by a skilful architect." The sketches of the capitals indicate a free interpretation of Corinthian or Composite, but there is, it appears, much bad carving among them. There seems to be little doubt about Mr. HAYTER LEWIS'S conclusions; and, if so, what are we to say about the infallibility of Mr. JAMES FERGUSON when we find him saying:—"There is no proposition connected with the topography of Jerusalem, to my mind, so clear and indisputable as that the buildings, popularly known as the Mosque of Omar—more correctly as the Dome of the Rock—and the Golden Gateway, are two of those described by EUSEBIUS as being erected by CONSTANTINE in honour of the death and resurrection of the founder of the Christian religion." It would be well if this were the only instance of an excess of confidence which Mr. FERGUSON displayed.

Mr. HAYTER LEWIS next considers whether the building from which the columns were taken belonged to CONSTANTINE'S time. After comparing drawings of them with examples in Syria, Rome, Spalato and Constantinople, he believes that "the capitals of the columns are in general executed in a style which is more debased than in any known example of CONSTANTINE'S time; the greater number, at least, of these columns must have belonged to buildings erected after his time, then ruined and re-erected at the Dome of the Rock. The columns are surmounted by dosserets, a peculiar form not known to have been used elsewhere until the sixth century."



The theory of Professor SEPP, who assigns the whole of the work of the Dome of the Rock to the Emperor JUSTINIAN, is next set aside by Mr. HAYTER LEWIS, but, as in the case of Mr. FERGUSON, with a gentleness which is not common in controversies on an archaeological or architectural subject. His own belief is "that the Dome of the Rock was the work of Arabs, designed for them by a Byzantine or Persian architect, and with Persian or Byzantine workmen, before the Arabs had developed any style of their own, and that it was built with the capitals, bases and columns ready to hand, being derived from the remains of churches and other buildings destroyed by CHOSROES and other invaders." It is to be hoped that this conclusion will settle the question.

A chapter is devoted by Mr. HAYTER LEWIS to the Mosque El Aska, which by some writers has been described as the great church erected by JUSTINIAN, and dedicated to the Blessed Virgin. But neither the style of the work nor the records will support that theory. The building was occupied by the Knights Templars for a time, but that appears to be its only connection with Christianity, unless we suppose that some of the materials were taken from St. Mary's Church.

The Golden Gate has nothing in common with the structure which RAPHAEL introduced in one of his cartoons. It is difficult to realise its original appearance, as the ends are blocked up; but Mr. HAYTER LEWIS says, when "seen through its length, the effect of the open double archway, with its light streaming through it at its ends, and leaving the centre part in shadow, must have been charming." He considers it to be a work of the time of JUSTINIAN.

The buildings belonging to the Church of the Sepulchre are described, and a reduction of the Ordnance plan is given. Mr. HAYTER LEWIS says the subject is a favourite with him, and he goes at great length into what he believes was the history of the building. He differs from the scheme of the original arrangement proposed by Professor WALLIS, and the plan in the book shows a much larger building as CONSTANTINE'S.

The final chapters are on Jeremiah's Grotto, which is by some writers taken as being near the place of the Crucifixion (Bishop GOBAT supposed the site to be more to the east), and on the Pool of Siloam.

There are, it will be seen, several most interesting questions discussed in this volume, but although mainly architectural, they will also be found attractive by biblica students. The illustrations are from surveys and photographs, and can be accepted as accurate.

#### WORKING IN GLASS.\*

By AUGUSTUS W. FRANKS.

THE Egyptians, if not the inventors of making glass, were great workers in that substance, and applied a vitreous coating to pottery, and even stone. The Egyptian specimens in the Slade collection are not so numerous as those in the Egyptian collection, but include an elegant vase in the form of a papyrus sceptre, made for holding the antimony or *stibium* to be applied to the eyelids, and a very remarkable amulet with the prenomen of Nuantef IV., a monarch of the eleventh dynasty, placed by Lepsius between B.C. 2423 and 2380. The glassworks of Egypt must have been in full operation under the Ptolemies; and during the Roman dominion they produced very elaborate specimens, especially some minute mosaic patterns, of which there are good examples. These were made by arranging in the required patterns a number of slender rods of glass of various colours, fusing them together, and then drawing them out, so as to reduce the whole uniformly; transverse sections of the rod thus obtained would each exhibit the same pattern. To the Phœnicians may in all probability be referred the numerous little vases of brilliant colours which are found in tombs throughout the borders of the Mediterranean. They exhibit everywhere the same technical peculiarities, and as they differ somewhat in form and make from unquestionably Egyptian specimens, it is probable that they are the products of the only other great centre of glassmaking, the celebrated works at Sidon. The forms are more Greek than Egyptian, frequently *alabastra*, *amphora*, and *praefericula*. The colouring is striking, generally in zigzag patterns of yellow, turquoise, or white, relieved by blue, brown, or green grounds. There are many fine vases of this kind in the collection, as well as one of the gold stands made to support them. To a later

period of the Sidonian workshops may probably be referred a number of small bottles of various forms, blown in moulds, and which have been chiefly found in Syria and the neighbouring islands. The specimens are in the shape of dates, grapes, heads, &c. Two of the vessels have on them the names of their makers, Eugenēs and Ennion. Several handles, once forming parts of small cups, are stamped with the name of the maker, Artas the Sidonian, in Greek and Latin letters.

The making of glass at Rome is said to have been introduced by Egyptian workmen, and must have been much practised there, as specimens of Roman glass are very numerous. The material was applied to a great number of uses, and the processes seem to have been quite as varied and well understood as in later times. The common clear glass has generally a greenish or bluish hue, though sometimes it is as white and brilliant as rock crystal; this latter kind was much valued by the Romans; the other transparent colours generally found are various shades of blue, purple, yellow, and green. A delicate pink is supposed to derive its colour from gold. The opaque colours are less commonly employed singly, but they occur in shades of yellow, blue, green, and black. The beautiful iridescence with which many vases are covered is not intentionally produced, but is the effect of time, which has partially decomposed the surface of the glass.

The simpler vases are only blown, with handles, feet, or ornamental fillets subsequently added; others are blown into moulds, and exhibit various designs in relief; some of the bowls have projecting ribs, and have been termed pillar-moulded. On some vessels, chiefly belonging to a late period, shallow engraving, executed on the wheel, has been added; others are cut in regular patterns. Sometimes a coloured ground was coated with white opaque glass, which was afterwards cut away, so as to produce a cameo, as in the celebrated Portland Vase, exhibited in the Ornament Room, and in the Auldjo Vase. In other instances a number of different colours were employed, sometimes, as in the Egyptian specimens above noticed, forming regular mosaic designs, sometimes blended into a mass of scrolls, rosettes, &c., and at others imitating onyx, agate, madrepore marble, or porphyries and other hard stones, though generally in more brilliant colours. Of these designs the variety is inconceivable, as may be seen by several bowls and numerous polished fragments. Occasionally gold-leaf was introduced, and at a late time the insides of cups and shallow bowls were decorated with patterns in gold-leaf, sometimes on the surface, sometimes enclosed between two layers of glass. To this class belong the fragments with Christian designs found in the catacombs of Rome, as well as the remains of a large disc from Cologne, on which, though much broken, eight Christian subjects may be distinguished. The mosaic glass, and especially that imitating various stones, was much used to line the walls, or to form the pavements of rooms. Very clever imitations of gems were made, and the glass intaglios and cameos have preserved to us designs of some of the greatest gem engravers, being generally moulded from gems, and not themselves engraved. After the fall of the Roman empire the glass works of the West must have gone to decay. In the East glassmaking was still continued, probably in the neighbourhood of Damascus. There are in the collection some very fine specimens, all decorated with enamel and gilding, including six mosque lamps of the fourteenth century, and two bottles with elaborate ornaments, as well as a number of Persian and Chinese specimens.

The oldest known specimens of Venetian glass are of the fourteenth century. The earlier examples seem to have the forms of silver plate, and are frequently massive and richly gilt and enamelled. One of the largest examples in the collection is a covered standing cup, with gilt ribs. Two of the earliest, and also most elaborate specimens, are a green goblet with portraits, and a blue cup with a triumph of Venus. The vases of brown glass are frequently very elegant, especially those in uncoloured glass; the stems are very often decorated with knots, and wings, and other fantastic additions in blue glass. Vases were also made entirely or partially of coloured glass, generally blue, purple, or green; sometimes a milky opalescent colour was produced, due, it is said, to arsenic; also an opaque white, derived probably from tin, which is further diversified with splashes of other colours. Another kind of variegated glass, which was called *calcedonio*, exhibits the streaky hues of the onyx, and was occasionally sprinkled with aventurine spots. Great use was also made by the Venetians of rods of glass enclosing threads of opaque white glass (*laticinio*), arranged in various patterns. Thus was produced the elegant lace glass (*vitro di trina*), in which Venice was unrivalled. Another variety (*à reticelli*) is ornamented with a network of opaque white lines, enclosing at the intersections bubbles of air. A goblet of this kind has in the foot a half sequin of Francesco Molino, Doge of Venice in 1647, marking the period at which it was made. The opaque white decoration is sometimes applied in parallel lines, sometimes in a wavy pattern, and exhibits endless variety. The Venetians were great makers of beads, with which, for many centuries, they supplied the world,

\* From the new Guide to the British Museum.



These were very often formed from sections of rods, with mosaic designs. Such sections were also sometimes worked up into vases (as by the ancient Romans), thence termed *vasefiori*. Of these there are good examples in the collection.

In France, glassmaking was long practised, but it is difficult to distinguish the productions of that country. A remarkable goblet has on it the names of Jean and Antoinette Boucicault, as well as their figures and device in enamel. It was probably made about 1530. The earliest dated specimen from Germany in the collection is of the year 1571; it is a large cylindrical cup (*Wiederkom*) with the imperial eagle, bearing on its wings the arms of the states, towns, &c., composing the German Empire. The German specimens are heavy in form, and often richly enamelled with heraldic devices and figures. Some specimens are painted in grisaille or colours, like window glass; such is a goblet dated 1662, on which is represented a procession in honour of the birth of Maximilian Emanuel, afterwards Elector of Bavaria. The engraved specimens are well executed, one of them is signed Herman Schwinger of Nurnberg. The ruby glass for which Germany was renowned is said to have been invented by Kunckel. In Flanders, glass seems to have been made in early times. In the sixteenth century many glass vessels (whether of native make or not is uncertain) were etched with various designs. Some of the specimens in the collection have portraits of historical personages, such as Philip IV., king of Spain, William II. of Orange, his wife Mary of England, Olden Barnevelt, and others. At a later time a delicate etching in dots was introduced; of this there are specimens signed by F. Greenwood, and several attributed to Wolf. Some of the Dutch engraved goblets are well designed, and show much richness of pattern. The earlier Spanish examples resemble closely the Venetian; the later are coarse and of no great technical merit. Drinking-glasses seem to have been made in England in the sixteenth century, the manufacture having been apparently then introduced by foreigners into Sussex and Surrey. Later, there were works in and near London, and the glassworks of Bristol attained some reputation. Of these last some characteristic specimens are in the collection, which is not, however, very rich in examples of English glass.

#### TECHNICAL EDUCATION.

ON the occasion of the opening of the Dundee Technical Institute, on Monday, an establishment that owes its existence to the liberality of the late Sir David Baxter, an address was given by Mr. Swire Smith. In the course of his remarks, after referring to the Royal Commission on Technical Instruction, he said:—"The English people—or at least, next to the Americans—are the largest buyers in the world; they have the most money, and the greatest amount of leisure in which to spend it. What is the consequence of all this? Our people, and particularly the ladies, are becoming more and more highly educated in matters of taste, and, as they are able to indulge their preferences, the time has literally come when, in dress at least, it may be said that 'the toe of the peasant touches the heel of the courtier.' Let me turn for a moment to the factories and other works visited by the Technical Commissioners, in which the superior goods so largely exported to the United Kingdom were being made. With the evidence before us, we were compelled to come to the conclusion that the import to this country of the overwhelming proportion of what may be called finished products is due neither to the low wages nor the long hours of our rivals, but to theoretical and practical instruction in science and art obtained in schools and applied to manufactures. How comes it to pass that there is a lessened demand for British plain goods on the Continent than in years gone by? This is caused mainly by the determination of Governments all over the world to render themselves independent of foreign imports. We must make up our minds to the fact that the manufacturing countries under protection are manufacturing for themselves the goods which they previously obtained from England, and that never again shall we supply to them the staple products of their consumption. But with increasing wealth there will be a growing demand in every country for novelties and artistic productions, and, whether we like it or not, if we are to keep our people employed and pay for the foreign food and raw materials which in such prodigious quantities we annually buy, we shall be compelled to cater more and more for the superior and attractive things which the people everywhere demand."

Having given some statistics, that in our imports and exports to neutral markets we had more to fear from foreign skill and taste than from foreign cheapness, Mr. Swire Smith continued:—"For my part, I have the greatest objection to the foreigner, because of his science taking the bread and butter out of the mouths of our own hungry people; but we shall have to submit to this folly of buying the product of the scientific skill of the German until we train the scientific

skill of the Englishman, the Scotchman, and the Irishman. Until, by connecting this Institution with University College, Sir David Baxter's trustees secured such a union of educational forces as should render possible the organisation of a complete scheme of instruction in science for the mechanics and craftsmen of the town, it may well have appeared to many that one thing was lacking still. I confidently anticipate that before long all classes of the community will unite in recognising the benefits which will flow from this union to those whom Sir David intended to benefit, and in commending the wise foresight which designed and carried it into effect. You have now in the union of the two Institutions an agency which unites science and art with practice, which supplies effective means whereby the workmen, foremen, and employers, or the young men from whose ranks these leaders and directors in industrial enterprises spring, can, for example, apply their chemical knowledge to dyeing, bleaching, or other operations having a chemical basis, their artistic and designing faculties to the pattern paper and the loom, and their problems in engineering and mechanics to the practical applications of the physical laboratory and the workshop. Without these or some other efficient means of enabling you on the one hand to carry science and art to the workshop and factory, and on the other to bring your workshop and factory difficulties to the laboratory, the designing studio, or the technical classroom, you would still have remained greatly inferior in equipment to those foreign manufacturers of whose competition I have given you such formidable examples. Happily, through the generosity of the late Sir David Baxter and the wise arrangements of his trustees to meet the altered educational conditions of the town, a completely graded scheme of scientific and technical education is now made possible, and Dundee is to be congratulated to-day upon the exceptionally superior equipment which you now possess for developing to the fullest capacity the intellectual resources, not of one class, but of all classes of your people.

"In the Continental towns, which are so lavishly supplied with educational institutions such as you now possess in Dundee, the expenditure is met in nearly every instance which I remember entirely from the rates and taxes compulsorily levied upon all classes according to their means and property. Our great country can boast of illustrious benefactors who, by their noble sacrifices for the welfare of others, have practically relieved some of our most fortunate communities of many of their responsibilities. As to the furnishing of your Institute, especially the textile department, I cannot point to you any Continental models for your exact imitation, but nothing is more easy for you than to profit by the experience of such schools as Bradford, Leeds, and Manchester. In Dundee you are mainly engaged in the spinning and weaving of jute and flax, but there is no reason why your students should not have facilities afforded them of studying the manipulation of other fibres with which you are less familiar, and if new branches of textile industries should thereby be introduced into your district, so much the better for your population. A variety of manufactures tends to give stability to a town, not only by extending the demand for labour, but as affording a natural protection against periods of depression which sometimes visit with exceptional severity those centres which rely mainly on one branch of industry. The object of your technical institute should not be to teach trades, but rather to impart instruction in the principles underlying trades. Regarding your textile department, I will undertake to say that there is no deficiency in the knowledge of plain weaving in Dundee. What you are more likely to be deficient in is in the manufacture of saleable fancy goods. Your weaving department should be first and foremost a school of design applied to weaving. In its main essentials the great utility of the school will turn upon the influence which it may exercise upon the production of artistic and novel designs and their application on commercial lines to the loom. And so if we may consider that if the chief aim of your weaving department will be to cultivate the application of designs to textile patterns, so the pure chemistry, which is being taught so efficiently in the splendid laboratory of the University College, will now be applied to dyeing, printing, bleaching, or to any other local industry in which such chemical knowledge is required. It is impossible for me to do justice to the wise arrangement which secures to the students of your Institute the advantages of the chemical, physical, and other appliances connected with the University College, with their splendid apparatus, models, and machinery; but it is quite evident that in these departments the greatest facilities will be afforded for the practical application of science in its varied forms to the many problems affecting your local industries, which cannot be solved in the workshops alone. I find that there is an impression among some of your business men that a technical school can do very little for Dundee, because your jute and linen trades are what are called 'plain trades,' and that the great bulk of your goods are not affected by fancy designing. There is no reason why you should be bound down eternally to the plain trades, and it appears that Sir David



Baxter's trustees are determined, if possible, to lift some small proportion, it may be of your jute and flax trades, out of the ruts, so that new developments may be attempted, and that Dundee shall be able to hold its own against any town or country in the manufacture of such goods as are wanted, not only in cheapness, but in quality and design."

### ART MUSEUM AT THE EDINBURGH UNIVERSITY.

THE room under the new dome of the Edinburgh University has very appropriately, the *Scotsman* says, been handed over to the Professor of Fine Arts, who has converted it into a museum, small but admirably arranged, of comparative sculpture. Circular in form, the room is 30 feet across and about 20 feet high. It is lighted on what may be called its four sides by large three-light windows, from any one of which a splendid view of the city and its surroundings can be obtained. The walls, lined with wood, are painted a flat Indian red. The frieze is in terra-cotta, the cornice in green-yellow, and the ceiling in grey-green. The warm tone of the room affords a pleasing relief to the sculpture it contains.

Round the walls of the Museum is carried a continuous shelf, and on it is arranged a small, well-selected collection of casts chronologically arranged, so as to illustrate the chief variations of Greek sculpture. On the walls above are photographs, chromos, and drawings of representative pieces of statuary, affording a glimpse of some of the other important forms of Greek and Roman art, while on a table in the centre are reproductions of bronzes, and of small terra-cottas chiefly recovered from the tombs of Tanagra in Boeotia.

Just on the left of the doorway is placed a small Egyptian portrait bust, dating from at least 3,000 years B.C., and beside it are specimens of Egyptian and Assyrian relief, included among the latter being a fragment from the palace walls of Assur-banipal, on which is sculptured a representation of that puissant king killing a lion, his armour-bearer being behind him with bows and arrows. The Oriental influence which was exhibited in early Greek sculpture is shown in a series of reliefs—one being a cast of a bronze panel from Olympia with eastern designs in repoussé work. In contrast to this we see in a small relief the earliest rude attempts at purely native art—the marble exhibiting clear traces of the earlier technique of the carvers of wooden statues. In this connection may be mentioned a fragment of the earliest extant pediment composition from the Treasury of the Megarians at Olympia, which belongs to the sixth century B.C. The ripe Archaic style, with all its decision and severity, is represented by casts of heads from the *Ægina Marbles* at Munich, their date being probably about 470 B.C., while the transition from Archaic to perfect art is illustrated by a head from the metopes of the Parthenon, on which was sculptured in high relief the contest between the Centaurs and Lapithæ—a favourite legend with Greek artists.

Following on some specimens of the ruder sculpture from the Temple of Zeus at Olympia, there are specimens of Pheidian work from the pediments and frieze of the Parthenon, including a fragment of the torso of Poseidon from the centre of the western pediment, showing powerful anatomical modelling, as also casts of the spirited horses' heads in the angle. There is a Victory loosing her sandal, noteworthy for the beautiful study of drapery which it presents, and Professor Baldwin Brown has also been fortunate in securing a fine cast of the Venus of Milo, the most exquisite of all the ancient statues, in which are combined feminine grace and softness without any sacrifice of the dignity of the "grand style" in sculpture. The work of the later schools is represented centrally by that of Praxiteles—the sculptor *par excellence* of ideal beauty—chief of which are a cast of the Hermes of Olympia, which was discovered by the Germans in their excavations in 1877—the "Genius of the Vatican" and the "Demeter" from Cnidos. There are also casts of a bronze head of Sleep from the British Museum, and the beautiful smiling head of a faun from Munich, both Praxitelean in character. Opposed to the beauty and refined expression of Praxitelean work, we have that of the realistic schools, led by Lysippus, which is here illustrated by a powerful but somewhat forbidding bronze head of a boxer from Olympia.

Later works, like the well-known Psyche torso from Naples, show the continued influence of Athenian refinement of feeling, while the sculptures from Pergamon represented by a magnificent head of a giant from the great altar of Zeus on the Acropolis of this ancient city, show to how late a date (second century B.C.) lasted the living inspiration of the great realistic schools of Asia Minor. Belonging to the period after Alexander, we have a portrait bust of a Greek girl in a freer and more homely style. Attic tomb reliefs of about the fourth century B.C. are represented by several selected examples, of

which one is a sympathetically treated seated figure of a Greek lady in an attitude of grief, with her handmaid standing beside her. There is also a fine terra-cotta slab for wall decoration with figure of Hercules from the Louvre. The frames on the walls contain a chronological series of photographs of statuary, including the well-known metopes of Selinus, portions of the Elgin marbles, as also chromo-lithographs showing the use of colour on Greek buildings and sculpture. One of these is a most artistically executed print by a firm in Copenhagen, showing the possible appearance of the Parthenon façade and frieze, which it is known was decorated in that way. Representations of beautiful Greek vases, enlarged photographs of coins and gems, jewellery, Roman and Pompeian wall-paintings, and other artistic decorative works have also been secured. There is also a very interesting set of drawings—published in *fac-simile* by the German Archaeological Society, which were made by a French artist about the end of the seventeenth century, before the Parthenon was blown up. The originals, which are in the National Library at Paris, are the most authentic record extant of the appearance of the Parthenon before that catastrophe. It may be added that in the dome room has been placed a bust in marble of the late Mr. Robert Cox of Gorgie, who bequeathed the funds for the completion of this part of the University. A tablet underneath speaks of him as a "just and generous man, a learned author, and an enemy of ignorance and superstition."

### DESIGN AND COLOUR IN TEXTILE FABRICS.

THE inaugural address in the Textile Department of the Yorkshire College, Leeds, was delivered on Wednesday last week by Professor Beaumont, who took for his subject "Design and Colour in Fancy Vestings." To the student of fancy weaving, as well as to the designer and manufacturer of various classes of textile fabrics, the vesting texture, with its varied ornamentation and colouring, he said, afforded an interesting field for investigation and study. When the manufacture and designing of that fabric were successfully effected, there were ample facilities for the display of the weaver's ingenuity and the designer's executive skill, and that fact partially accounted for the production of those elaborate masterpieces of woven pattern which had marked the vesting epoch, and which were still invaluable examples of ornamental weaving, combining in their manufacture technical skill with artistic knowledge. Within the narrow limits of the sample styles now applied to woollen and worsted fabrics, practically there was comparatively little scope for the invention of novelties either in colouring, texture, or design. Although the vesting trade was not yet a complete nonentity in the West Riding of Yorkshire, where it had once formed an important branch of the staple textile trade, still it had ceased to be extended or developed as its capabilities deserved. The vesting fabric, when considered in all its relations and technicalities, probably required in its execution a more complete knowledge of weaving than any other class of loom production. An artistic taste for form and colour was but one qualification of the vesting designer, for as the development of his art design was dependent on its accurate adaptation to the loom, he must, in order to be successful in the work, be conversant with the technicalities of the weaver's craft. Woven design required distinct treatment from other species of decoration; it was not simply surface ornamentation, but a constructing of a suitable texture for developing the pattern and for the purposes to which it was intended to be applied. Every description of textile designing had, in a word, a twofold relation, for it was both utilitarian and ornamental. In order to develop the integral parts of woven design by imparting appropriate prominence to certain sections and subordinating others, a knowledge of structure of textile fabrics was indispensable. The fancy vesting designer, as a rule, displayed that technical skill in his productions whether judged from a weave or an ornamental standpoint. The vestings of from forty to fifty years ago, notably those known as quiltings, were masterpieces of ingenuity and manufacturing skill. Having given illustrations of the chief characteristics of fancy vestings—(1) the weave, (2) the design, and (3) the colours, Professor Beaumont said that one of the principal lessons to be learnt from a study of those interesting cloths was that a thorough mastery of the capabilities and technical details of the weaver's craft was at the basis of successful textile designing. Admitting that there were certain principles of form and colour common to all decorative arts, still, if proficiency in producing woven patterns was the goal before them, it was imperative that an experimental knowledge of the nature of the materials of manufacture and of the structure of the article to be produced and ornamented should be acquired. Economic and novel woven effects were only obtained in proportion as those matters were taken into consideration. Such conditions compelled them to recognise that textile designing had both its theoretical and practical rela-



tions, involving a study of those changes in fabric and design which the loom, when skilfully controlled, could be made to produce, and also of the province of colour and of materials in pattern construction. By devoting attention to those technical details, and by systematic experimental research and investigation, new and more economic processes of manufacture might be devised, and also novel principles of intertexture originated, resulting in an extension of the great textile industries of the country, whose prosperity not in a small measure affected the well-being of the whole community.

On Friday evening Professor Hummel, at Leeds, gave a lecture on "Fast and Fugitive Dyes," being the last of a series of free public lectures in connection with the Yorkshire College Evening Classes. The stability and permanence of colours, he said, was a matter of great importance to the artist who used them and to the public who admired and bought the artist's productions. It had been noticed, however, that the water-colour drawings of certain artists had very materially faded, and it became necessary that the whole list of water-colours at present employed should be thoroughly examined. This had recently been done, with the satisfying result that, although there were a great many fugitive colours employed, there still remained a good range of permanent colours available to the water-colour artist. Although the art of the dyer was not to be compared with that of the painter, he was responsible for the production of real works of art in the shape of tapestries. But when they saw with regret the faded tapestries of Hampton Court and Holyrood, it became necessary to consider whether the colours used in modern tapestries were better or worse in point of stability than those formerly employed. Of course, the most important use of the dyer's art was in the ornamentation of textile fabrics used for clothing. In discussing the subject of fast and fugitive dyes, it was necessary to define the meanings of the terms. As at present employed, they had a very wide and indefinite signification. Fast colours to one person implied that the colour would not fade when exposed to light and atmospheric influences, to another that it was not impoverished by washing, and to a third that the colour would withstand the action of certain manufacturing processes. No colour, however, was absolutely fast, and it was not necessary to demand absolute fastness from any colour. For all practical purposes it was enough to consider as a fast colour one which did not suffer from those influences to which, in the natural course of its uses, it was submitted. And the word "fugitive" had also an indefinite meaning until a qualifying statement gave it precision. Colours were faster on some fibres than on others; they were fastest on wool and silk, and most fugitive on cotton. With most colours it was probable that the fading was due to oxidation, since the air and moisture played such important parts in the matter. The fastness of a colour, however, was sometimes influenced by the mode of application, and it was necessary in order to produce the most perfect colours that the colouring matter and mordant should bear a definite relationship to each other. Having referred to the operation of "milling," or "fulling" in manufacture, in which the dyed fabrics had to withstand the action of soap and friction, Professor Hummel concluded by saying that the dyer should be thoroughly cognisant of the properties and sensibilities of all colours, and, by experiments, he should find out the best method to apply them, so that he might be able to choose those colours and those methods which gave the fastest colours to light, milling, and other influences. That was exactly the kind of work which was being taught in the classes at the Yorkshire College, and if the art of manufacture was to increase, more attention should be paid to the advantages offered to young dyers.

#### COLOUR APPLIED TO ORNAMENTAL DESIGN.

LAST week a lecture was given by Mr. Charles Stephenson in connection with the Art Department of the Yorkshire College, Leeds, on "The Theory of Colour as applied to Ornamental Design." After illustrating by diagrams and experiments the effects of simultaneous contrast of one colour upon another, the lecturer showed how they could be practically applied. Bright colours, he said, could not be formed into harmonious combinations. They should only be used in combination with broken or neutral tints, and never by themselves, otherwise the contrast would be too crude. There are two kinds of harmony—harmony of contrast and harmony of analogy. The harmonies of contrast are combinations of colours that are the farthest removed in the chromatic scale. Harmonies of analogy are combinations of the colours nearest allied. The easiest way of composing a harmonious assortment of contrasting colours is by choosing colours which have an admixture of other colours. Analogous colours are much easier to harmonise, but with these colours there is always the danger of producing dinginess, and the best way of avoiding this dinginess is to have at least one of the colours lighter in tone than the

others. Most of the patterns for woollen cloths for wearing apparel are harmonies of analogy. In these cloths great care should be taken to avoid dinginess, and especially for men's wear. In designing a cloth, this smartness or newness should never be lost sight of. Concluding, the lecturer said that anything relating to art could not be bound by rules: it would at once cease to be art. Rules can never take the place of taste or imagination, more especially in colour, but the proper observance of the laws of contrast will facilitate choice and keep imagination from being too capricious.

#### EDINBURGH ASSOCIATION OF SCIENCE AND ART.

THE first meeting for the session of this Association was held on Monday evening, Sir R. Murdoch Smith, hon. president, in the chair. Mr. John Melrose, builder, of Leith, the retiring president, gave the usual address. The membership, he said, was now 291, against 265 last year. Much attention had been given to subjects in connection with sanitary science, especially in relation to the drainage of dwelling-houses. The movement of population was in these days towards the large towns, and the changed conditions for country people in respect of atmosphere and surroundings made sanitary science of increasing importance. It was therefore proper that an Association such as theirs, which numbered among its members many mechanics and others connected with the building trades, should seek to instruct them scientifically and technically in what pertained to the means of preserving and improving public health. Other subjects to which attention had been given included important departments of art and science, photography, Persian art and industry, the iron industries, pattern-making, &c.

#### TESSERÆ.

The Renaissance Influence.

B. M. RANKING.

IN Italy, the school and the home of Mediæval art, there arose about the middle of the fifteenth century a great revolution. For five hundred years the whole art realm had been under the rule of a mighty and beneficent despotism; the North had given laws to men as to princes. But now in the fulness, or rather in the over-ripeness of time, this rule was beginning to lose those characteristics by which it had won dominion, and established its right thereto. Gothic art had fallen from its first strength and manhood into a specially terrible form of dotage, an imbecility which retained just such faint recollection of old nobility as impelled men to go on trying at repetition of what had been great with ever-decreasing power; necessarily decreasing, since at the best there was only imitation now of what had been spontaneous, and soon there was only imitation of imitation. But, though the right hand had just lost its cunning, the heart had not lost its life; it was asleep, not paralysed. To its awakening there came a voice from the ages, from those old times when Greek bowed down before the beauty he had made, because he believed in the beauty which his image sought to shadow forth; and when Roman tried to copy Greek, seeing his idea to be the noblest, there was a great rising as of the sea, that truest and most glorious emblem of humanity, and the old realm was swallowed up like a second Lyonesse, not to be forgotten, but to leave its towers gleaming up through the waves of thought and learning, as the buried abbeys shine through the waters of the Irish lake, and its memories calling to men's hearts as their muffled bells ring at the Angelus. Gothic art had become false to the world and to itself, and the heart of man, craving for truth, began to look elsewhere for its ideal. In the revival of old Classic forms truth was found, or what had been truth. Perhaps the hot-hearted seekers forgot that what was right to the ancients, because they believed in that from which it took its rise, was not right to them since their faith was different. I say this because to me, the earlier period at its best, and I think we have no right to judge of it by its decadence, is immeasurably grander than anything which has succeeded, as much finer as those all conquering Celts and Teutons were than the Southerners whom they dispossessed; but still it was a search and a yearning after truth, and therefore there came of it noble results. One special and most important form of truth there was, upon which the thinkers of this time particularly dwelt—the belief in man. In man, as a living, breathing, noble existence, not as the mere dust of the earth: in man, as the noblest thing known, as the image of that God after whom they, in their search for truth, were dimly seeking. The Mediæval mind, forgetting the old tradition of manhood, and misreading the text by which they sought to guide their actions, had come to despise this beautiful body of ours, as if it were something



to be ashamed of instead of to glory in, that man is the grandest of created beasts. This the spirit of truth could not away with, and again in the old myths there was the fitting reverence found; so in this, as in other respects, they were held unimpeachable, and the Renaissance gained ground.

#### Pietra Dura Mosaic.

C. H. WILSON.

The mosaic work of Florence differs entirely from Roman mosaic, being composed of stones inserted in comparatively large masses; it is called work in *pietra dura*. The stones used are all more or less of a rare and precious nature. In old specimens the most beautiful works are those in which the designs are of an arabesque character. The most remarkable specimen of this description of *pietra dura* is an octagonal table in the Gabinetto di Baroccio, in the Florence Gallery. It is valued at 20,000*l.* sterling, and was commenced in 1623 by Jacopo Datelli, from designs by Ligozzi. Twenty-two artists worked upon it without interruption till it was terminated in the year 1649. Attempts at landscapes and the imitation of natural objects were usually failures in former times—mere works of labour, which did not attain their object; but of late works have been produced in this art in which are represented groups of flowers and fruit, vases, musical instruments, and other compatible objects, with a truth and beauty which excite the utmost admiration and surprise. These pictures in stone are, however, enormously expensive, and can only be seen in the palaces of the great. Two tables in the Palazzo Pitti are valued at 7,000*l.*, and this price is by no means excessive. These are of modern design on a ground of porphyry, and ten men were employed for four years on one of them, and a spot is pointed out, not more than three inches square, on which a man had worked for ten months. But Florentine mosaic, like that of Rome, is not merely used for cabinets, tables, or other ornamental articles; the walls of the spacious chapel which is used as the burial-place of the reigning family at Florence are lined with *pietra dura*, realising the gem-encrusted halls of the Arabian tales. Roman mosaic is of great value as an ally to art; but Florentine mosaic can have no such pretensions, and time and money might be better bestowed. The effect is far from pleasing in the chapel I have alluded to, and I think that the art might be advantageously confined to the production of small ornaments, for which it is eminently adapted. An imitation of the *pietra dura* is now made to a great extent in Derbyshire, where the Duke of Devonshire's black marble, said to be quite equal to the famous Nero antico, is inlaid with malachite, Derbyshire spars, and other stones; but the inlaying is only by veneers, and not done in the solid as at Florence. This, with the softness of the materials, makes the Derbyshire work much cheaper.

#### The Use of Caryatids.

W. H. LEEDS.

The current legend respecting the adoption of caryatids in Greek architecture may be true or may be false; but at all events it is not necessary in order to account for pillars being shaped to resemble human figures, such figures being frequent in the Egyptian style—of course with very wide differences as to taste and design, the fundamental idea being nevertheless one and the same. Far more to the purpose is it to consider the æsthetic effect of such statue-columns, and their value in architectural composition. That while they greatly extend the resources of the latter, there is direct classical authority for them, and that in an example fraught with the most exquisite taste, is undeniable; notwithstanding which, the propriety of the taste so displayed has been called in question, or rather has been peremptorily condemned. It is contended that such figures both suggest painful ideas and partake of the preposterous. With regard to the first of these objections, it is difficult to understand wherefore statues performing the office of pillars should excite any idea of pain if they themselves express no such feeling—which of course they ought not to do—but stand calm, immovable, and indicate perfect ease and tranquillity. As to the preposterousness of employing human forms for offices which living human beings could not possibly perform, if there be absurdity in that, it is of a species which extends itself—or I might say, incorporates itself—with a very great deal of both architectural decoration and ornamental design generally. It has been said that whatever is contrary to common sense is contrary also to good taste. The validity of such dictum depends very much upon the latitude allowed to the term "common sense." If we are to understand by it merely the knowledge based upon actual experience, a very great deal that has hitherto been regarded as manifesting refined taste must be set aside altogether, and pronounced to be in very false taste. If caryatids are to be condemned as inconsistent with good taste because they represent the human form contrary to what we know by common sense it is capable of, the same authority of common sense must pronounce statues

employed as pinnacles and acroteria on pediments or elsewhere to be equally repugnant to good taste, they being placed for a continuance where real persons—if they could stand there at all—could remain for only a few minutes, and that at the peril of their necks and limbs. Again, how can we reconcile with plain common sense such classical monstrosities as arabesques or human and animal figures terminating in foliage? Nay, is there anything of common sense—that is, of plain, honest, matter-of-fact common sense—in the cramming a crowd of figures into a pediment, where half of them are perforce crouching down? Or what shall we say to such conceits as corbel-heads, or to statues fixed in between the mouldings of the head of an arch, in such manner that some of them are nearly in a horizontal position? If common sense is not startled by them, it may surely excuse what are less at variance with it, namely, caryatids, which last are at once so picturesque and elegant in effect, that their being so rarely employed may well excite our wonder. Their being frequently employed is not to be looked for, on account of their expensiveness as compared with other pillars of the same dimensions; still, what prevents their becoming too common by being applied on ordinary occasions should operate as a strong reason for introducing them where magnificence is affected, and cost becomes a secondary consideration.

#### Water Supply of London.

SIR J. RENNIE.

Spring water was formerly conveyed to public reservoirs in the City of London by leaden pipes from various springs in the vicinity, viz., from Tyburn in 1236, from Highgate in 1438, from Hackney in 1535, from Hampstead in 1543, and from Hoxton in 1546. For these useful works the citizens were indebted to the munificence of several lord mayors and other individuals, but those of Hampstead and Highgate are the only ones now remaining. The open watercourse or conduit from Dartmoor, 24 miles long, for supplying Plymouth with water, commenced by Sir Francis Drake in the reign of Elizabeth, and the New River for the supply of London, 39 miles long, 28 feet wide, and 4 feet deep, falling 3 inches in a mile, by Sir Hugh Myddelton, in 1613, are considerable works of the kind, and were planned and executed at the cost of those distinguished individuals. Myddelton was, in fact, ruined by it, and adopted the profession of engineer and surveyor to obtain a livelihood. London Bridge Waterworks were commenced by Morrys, in 1582, with water-wheels turned by the flood and ebb current of the Thames, passing through the purposely-contracted arches of Old London Bridge, and working pumps for the supply of water to the metropolis; it was the earliest example of public water service by pumps and mechanical power which enabled water to be distributed in pipes to dwelling-houses. Previously water had only been supplied to public cisterns, from whence it was conveyed, at great expense and inconvenience, in buckets and watercarts. In addition to the London Bridge and New River, several minor establishments of the same kind were afterwards erected on the banks of the Thames, to supply separate districts in their immediate vicinity. Some were worked by water-wheels on the sewers which discharged themselves into the Thames; others, by horses; and one by a windmill. That at Broken Wharf in 1594, at Shadwell and York Buildings, worked by horses, and at Chelsea by water-wheels, may be mentioned. Early in last century, when the old cisterns had nearly disappeared, and water was supplied to the dwellings, a great improvement took place by the application of the steam engine (which had then begun to develop its extraordinary powers) to the York Buildings Waterworks by Savery, in 1710, and afterwards by Newcomen in 1730. Newcomen's engines were subsequently applied at Chelsea Shadwell, Stratford, London Bridge, and the New River Waterworks. As soon as Watt had brought his improvements into operation for pumping water, his engines were applied at each of the above waterworks by degrees, in addition to the old engines.

#### The Metaphysics of Art.

VICTOR COUSIN.

Art is the free reproduction of the beautiful, and not of natural beauty only, but of ideal beauty such as the human imagination conceives it by the help of the data which nature furnishes. The ideal beautiful envelops the infinite: the object of art is, therefore, to produce works which, like those of nature, or in a still higher degree, have the charm of the infinite. But how and by what conjuring to draw the infinite from the finite? Here lies the difficulty for art, but it is also its glory. What carries us up towards the infinite in natural beauty? The ideal side of that beauty. The ideal! See there the mysterious ladder by which the soul ascends from the finite to the infinite. The artist must, therefore, devote himself to the representation of the ideal. Everything has its ideal. The first care of the artist will therefore be, whatever he does, to



penetrate the hidden ideal of his subject, for his subject has one in order to render it more or less striking to the senses and to the soul, according to the conditions which the materials he employs impose upon him, be they stone or colours or tones or words. Thus, to express the ideal, the infinite, in one way or another, this the law of art: and all the arts are such only by their relation to the sentiment of the beautiful which they awaken in the soul, by means of the supreme quality of every work which is called expression. Expression is essentially ideal: that which expression attempts to make felt is not that merely which the eye can see or the hand touch, it is evidently something invisible and impalpable. The problem of art is to reach the soul through the body. Art offers to the senses forms, colours, sounds, words, so arranged as to excite in the soul, concealed behind the senses, the ineffable emotion of beauty. The expression is addressed to the soul as the form is addressed to the senses. The form is an obstacle to the expression, and yet at the same time it is its imperious, its inflexible, its sole and only means. It is, therefore, by working with form, bending it to its service by force of care, of patience, and of genius, that art comes to convert an obstacle into a means.

#### The Author of "Vitruvius Britannicus."

F. EAST.

Up to the sixteenth century architecture was less definite in outline, less studied in symmetry—you were awed by the mass, or were charmed by the intricacy of its parts—you were arrested, it is true, but then the whole was after all only an agreeable perplexity. It was reserved for Jones and his followers to turn the stream of taste and to transplant the graces of Italy. But the followers of Jones had not very much of their master's sentiment. They seem to have followed the fashion of the time, as much as the sentiment of Palladio. Hence we find Hawksmoor and Vanbrugh easily catching the precise feeling of Grecian rule, to the prejudice of the Italian. Campbell, however, as a follower of Jones, and as a Palladian architect, seems more deserving of attention, though whether he features the original or only staggers after him is a question. In his mansions (so many of which grace our land) the sentiment of Palladio and the style of Jones seem both affected. Still you are conscious at the first glance of a stiffness in the design. You feel if an important part is to arrest that it becomes very often unpleasantly independent of the remainder; or if a change of features are successively to please, that you are not led to them by approaches sufficiently easy. The eye is not courted, it is forced. Sudden changes, too, often occur from the horizontal to the vertical, in that part where altitude is the aim; and very often in the front a sudden depression of the sides, disuniting to a certain extent the centre from the rest, and destroying in a measure the harmony of relations by a want of unity. It seems as if the artist occasionally leapt into his parts; as if notwithstanding his apparent study of every subordinate feature in the Palladian style, and of the principles of Italian arrangement, the stiffness of the copy must remain rather than the freedom of the original. It is true that you are looking at the design of a Palladian architect; that there are dispositions of the void and enriched, of the depressed and the elevated; that there are the same segmental and triangular windows in mutual relief; that balustrades crown the void, and that turrets, cupolas, columns, figures, &c., prevent you dwelling on the breadth: but then you see too much of a studied arrangement. You can almost detect the labours of the artist; you can almost discern the process by which the features of his design are apportioned; you see the architect as much as his edifice. When he introduces ornament he makes you to revel very often in a part where the eye should not remain, or he encloses a free figure in some stiff panel and destroys its expression. The decoration is not such that the part would look bare without it, or that the proportion would become affected if it was not there. You see not as in Jones the ornament as identified with the mass, but only as a part of it. You detect too much of the hand which placed it there, and too little of its relation to surrounding objects. Contrasting him with Jones, whom he imitates, or with Palladio, whom he affects, we at once see that his very study makes him miss the careless beauties of the former, whilst his caution prevents him soaring into the grand simplicity and rich excellence of the latter. Campbell thus, although of the Palladian school, is only of such in its leading characteristics. That quick perception of grace and of beauty ever necessary to relieve the huge superficies is not his. His sensibilities seem dull upon the lesser auxiliaries, so useful to design. He is not grand in his comprehension, and yet at the same time minute in his care; or if he does descend to minuteness, he does not change from the greater to the less, from the grand to the inferior with the care of a genius, but creeps into his parts with the fear of a copyist. Finally, he seems to have wanted more quickness of apprehension, more fertility of thought, and more liveliness of fancy, to have in any way equalled his originals.

#### The Royal Academy.

J. P. DAVIS.

The artists of England assuredly have done their duty. They have manifested at intervals, and by individual efforts, talents which sufficiently refute that charge of national incapacity with which foreign criticism has not scrupled to assail us, and this they have done at enormous disadvantage, for art in this country has been ridden by an incubus which has stifled its energy and crushed its independence; nor will it ever, until divested of that incubus, erect itself into the fulness of its stature and be seen in its true dimensions. I allude, of course, to the Royal Academy, an institution which differs little from others of the same sort, when and wherever established, except that it has developed in more than ordinary luxuriance the corruptions natural to such bodies. The whole history of State academies bears witness to the fact that they have invariably tended to frustrate the objects which they were meant to promote. The greatest masters of art, those especially who in the fifteenth century carried it to such supreme perfection, were no scions of academies; but, subsequently, princes and statesmen, laudably anxious that their own times should reflect something of that splendour which irradiated those of their predecessors, endeavoured to call forth new races of great artists by patronage and premiums; they instituted academies, with all the pompous paraphernalia of presidencies, professorships, lectureships, and all sorts of ships which turned out miserable craft, useless for everything but show. These forcing-houses of excellence proved in the experiment to be nurseries of mediocrity, schools of intrigue, hotbeds of pretension, and graves of talent. In the train of academies come public exhibitions, which in their character and consequences have been fatally injurious to public taste. Hundreds of pictures are got together at a given signal, and, after the managers have appropriated the best places to their own works, subjects the most anomalous, effects the most discordant are jammed together in ridiculous juxtaposition and suffocating contact. Exhibitors soon discover that amidst such a *melée*, any attempt at the refinements of art is worse than useless. Stare and glare, therefore, become the order of the day. No trick is thought contemptible provided it entraps attention, and, as it happens at a Christmas pantomime, the greatest buffoon is often the greatest favourite.

#### St. Stephen's Abbey, Caen.

E. A. FREEMAN.

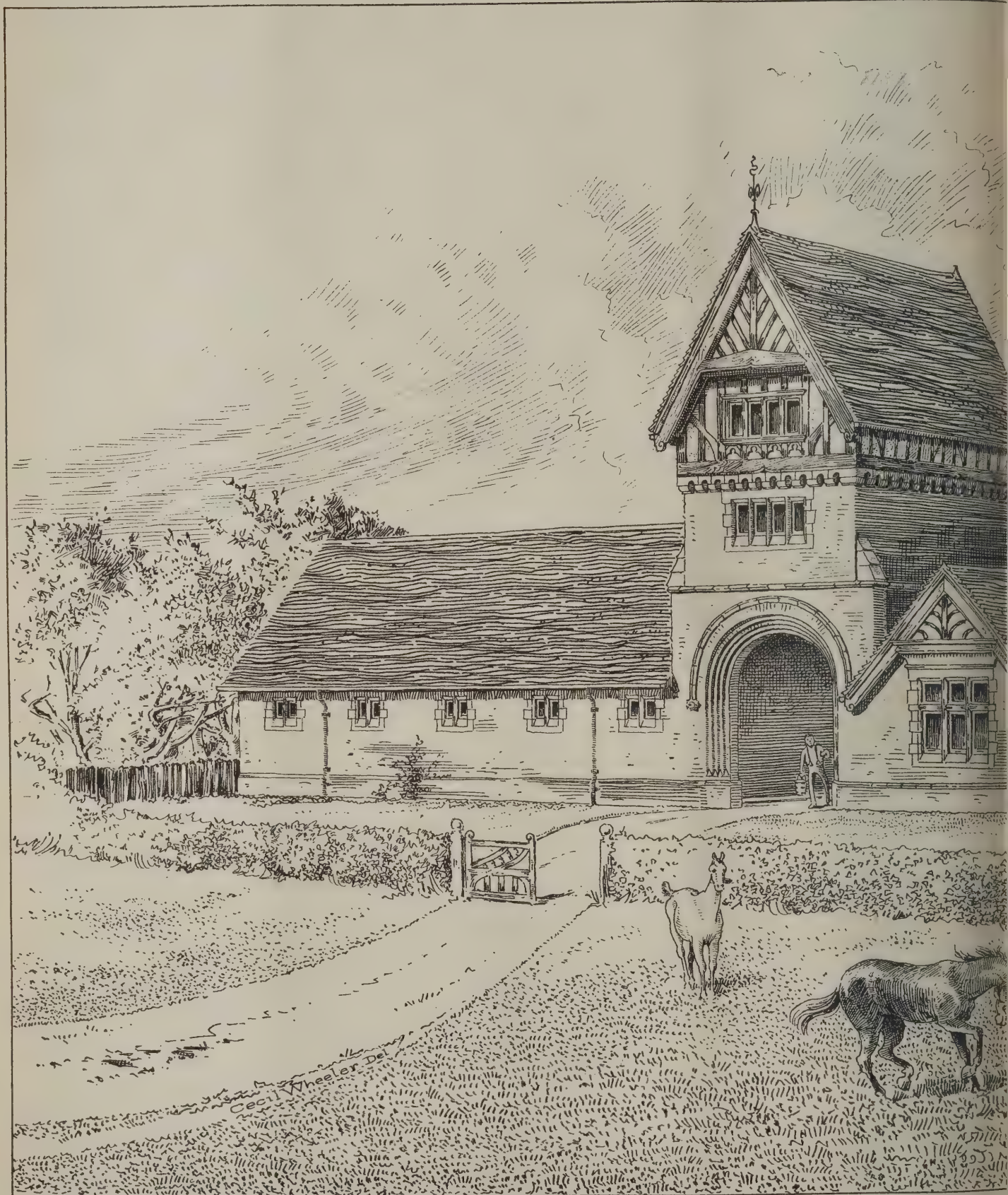
It is well known that the original parts of St. Stephen's, the nave and transepts, are among the grandest, though also among the plainest, examples of the matured, though still early, Romanesque of Normandy. The church which William founded, and of which Lanfranc was the first abbot, is in every way worthy of the men who reared it. Grand in proportion, simple and severe in style, but as far from rude or unfinished work as any building can be, it is exactly the sort of church which we should expect that William the Conqueror would build. It forms a marked contrast to the rich work of the sister minster, Matilda's church of the Holy Trinity. Of course, it is not fair to compare St. Stephen's with the latter Romanesque work at Trinity, but the contrast between St. Stephen's and the earliest parts of Trinity, the parts which are doubtless due to Matilda herself, is still very striking. Matilda's church, far more elaborate in point of ornament, is built on a much smaller scale, and the composition of its interior altogether lacks the grand simplicity of St. Stephen's. The contrast between the work of William and the work of the next age at Bayeux is yet more striking. Yet we do not believe that it is merely a question of date. St. Stephen's, to our mind, bears on every stone the impress of the character of its founder. It is built in the most advanced style of the day. It shows none of those traces of an earlier style of Romanesque which hang so thickly about Bernay, and to a considerable extent even about Jumièges. It is pure and fully-developed Norman. It is grand and plain, simply because William's taste decreed that it should be grand and plain. The feminine tastes of his wife as naturally preferred a building far more enriched, but incomparably less stately. Besides its connection with the Conqueror, St. Stephen's has also another point of attraction for Englishmen in its connection with Lanfranc. The great scholar and reformer was moved from Bec to Caen, and from Caen to Canterbury. He had much to do with building at all three places, and the three minsters were consecrated in one year. The church of Bec has perished; the last traces of Lanfranc's church at Canterbury vanished hardly a generation back; but we know that Caen and Canterbury were built on the same model, and as nearly as possible on the same scale. We may fairly guess that Bec was something very much of the same kind.

The Southampton Art Society will open their third annual exhibition on the 31st inst.









Stable Buildings, Ashham, N<sup>r</sup> York, for Sir





drew Fairbairn.

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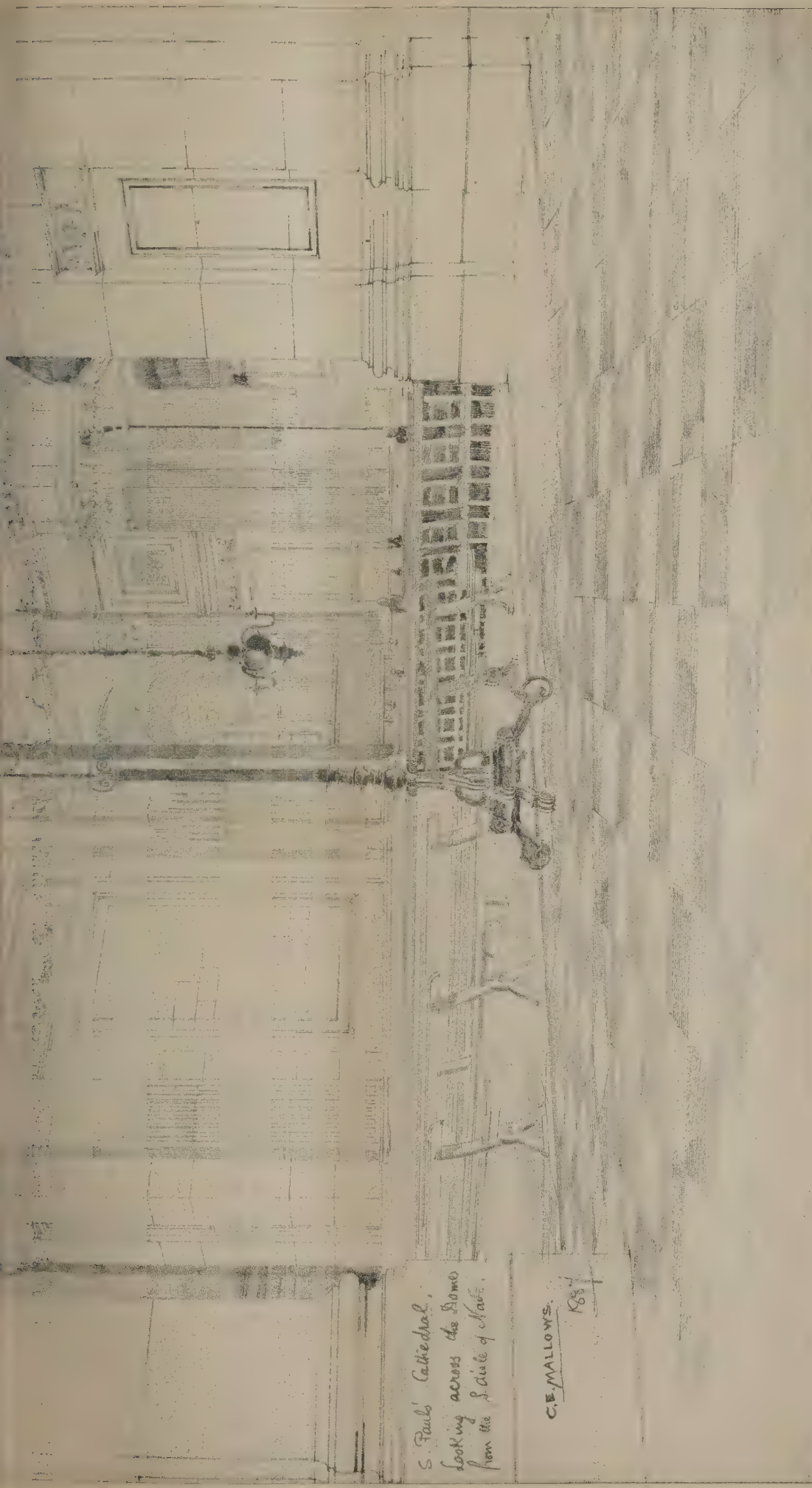




Die Architektur. Oct. 19<sup>te</sup> 1888.







"INK PHOTO" SPRAGUE & CO. 22 MARTINE LANE, CANNON ST., LONDON E.C.

ST. PAUL'S CATHEDRAL - LOOKING ACROSS THE DOME  
FROM THE SOUTH AISLE OF NAVE.  
From a Drawing by C. E. MALLONS.

*Architectural Illustrations Society Second Series Plate No 31*



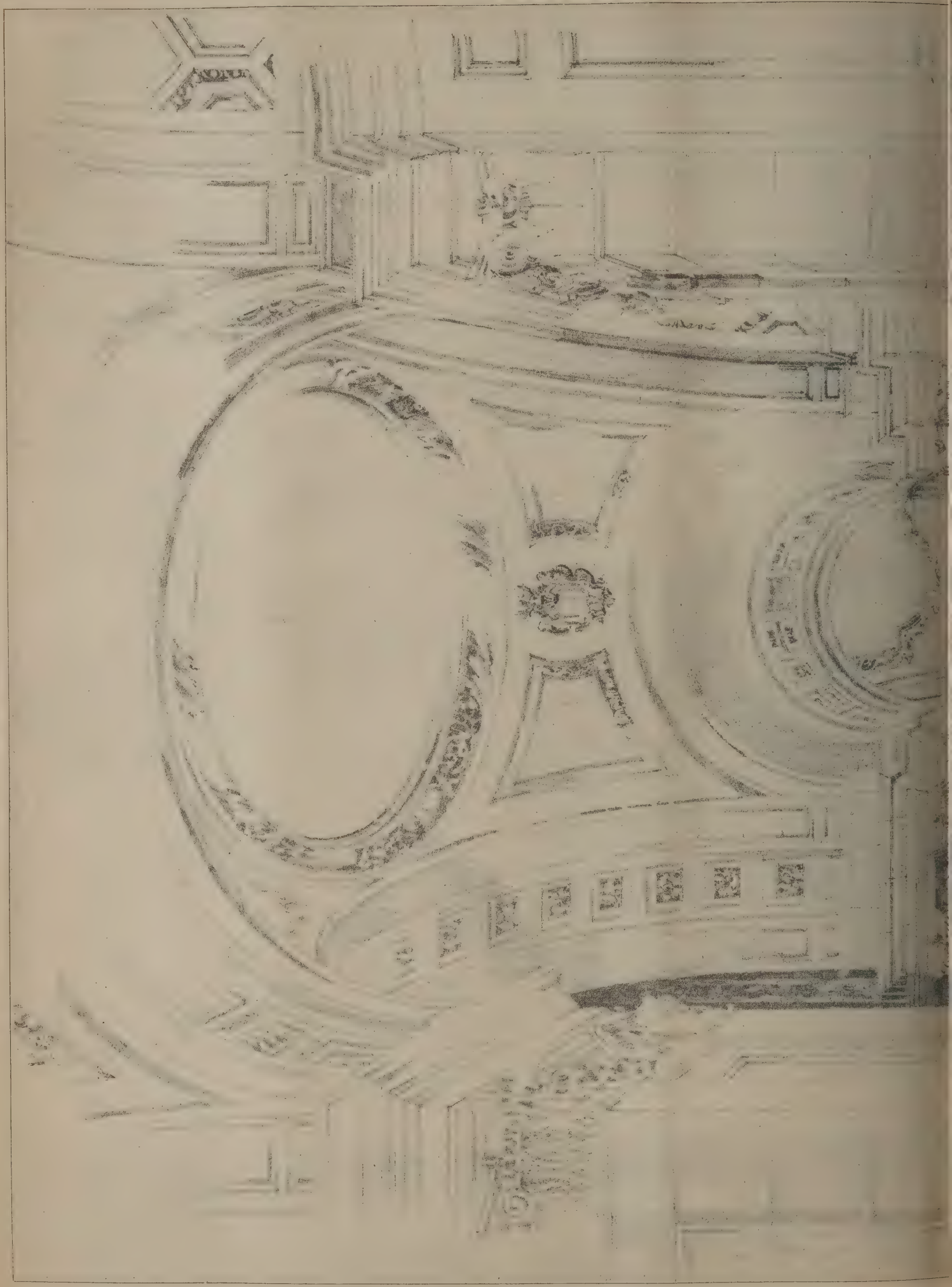








The Architect, Oct. 19<sup>th</sup> 1888.







LOOKING WEST FROM  
THE NORTH AISLE

ST. PAUL'S  
CATHEDRAL

ST. PAUL'S CATHEDRAL-LOOKING WEST  
FROM THE NORTH AISLE OF NAVE.

From a Drawing by C. E. MALLOWS







## ILLUSTRATIONS.

STABLE BUILDINGS, ASKHAM.

THESE buildings form part of the premises of Askham Hall, belonging to Sir ANDREW FAIRBAIRN, of which we have published several illustrations. The architects are Messrs. CHORLEY & CONNOR, of Leeds.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.NO. 31.—ST. PAUL'S CATHEDRAL. VIEW FROM SOUTH AISLE.  
[C. E. MALLOWS.]NO. 32.—ST. PAUL'S CATHEDRAL. VIEW FROM NORTH AISLE.  
[C. E. MALLOWS.]

## BUILDING IN OXFORD.

AN exhaustive account is given in the *Oxford Chronicle* of the principal building operations and architectural improvements that have been begun or completed in Oxford during the past year. Our space will not at present, however, allow us to make more than a brief abstract. The increase of buildings during the past century will be seen from the following table:—

Date.	Houses.	Increase of Houses.
1789	1,816	—
1801	1,878	62
1811	2,081	203
1821	2,551	470
1831	3,402	851
1841	4,335	933
1851	4,736	401
1861	5,147	411
1871	5,844	697
1881	6,588	744
Increase of Houses, 4,772.		

In the previous three centuries Oxford could have very little increased in size, as no new churches were erected in the city. In the last sixty years as many churches, exclusive of chapels, have been built and endowed as in the previous eight hundred years. The greatest increase of inhabited houses and population is between 1821 and 1841, owing to St. John's College destroying the last remains of Beaumont Palace and laying out the Beaumont Closes (now Beaumont Street and St. John's Street) and other property for building purposes in 1821, when the average number of inmates per house had risen from 4.6 in 1789 to 6.1. This was the beginning of the great building movement in the north of Oxford which led to the removal of many old close courts and alleys, and has since covered St. Mary Magdalen, Jericho, St. Thomas, St. Ebbe, Holy Trinity, Osney, St. Paul's, St. Barnabas, Summertown, St. Clement's, the Cowley district, Grandpont, and New Marston with their multitude of houses, providing better accommodation for all classes of society. The rate of increase slackened from 1841 to 1861, but was reinvigorated by the establishment of three building societies, founded in our midst during the last thirty years, encouraged by the free trade tariff of Sir Robert Peel, which took off the heavy duties on bricks, glass, timber, and other building materials. The increase in the number of houses is due in some measure to an enlarged area, but chiefly to new houses in the new and old city boundaries. Of the original 1,816 houses which existed a century ago few remain, and we cannot fully appreciate the architectural improvements, the increased and improved house accommodation in Oxford and its suburbs, without calling to mind, or endeavouring to realise from this description, the vast number of wretched old houses, alleys, and courts which have been removed in that period.

One of the important works at the University is the new Mansfield College, now approaching completion, from the designs of Mr. Basil Champneys, B.A., of which an account is furnished by Mr. S. Kemp, the clerk of works.

The buildings are grouped, forming three sides of a quadrangle, having a handsome tower with a flanking octagonal turret. The president's house and library block, which are connected by an octagonal staircase turret, forms the west wing; the lecture-room block, tower, and dining-hall block form the south side, having a frontage of about 180 feet, the tower being nearly central; the chapel forms the east side of the quadrangle. The whole of the stone for the exterior elevation is Taynton, from Messrs. Groves's quarries at Milton; for inside dressings Corsham Down has been used. The slating is by the Naunton slates, and harmonises well with the stone-work. Messrs. Parnell & Sons, of Rugby, are the general contractors.

There has been an extensive restoration to the stone-work on the north and south side of Merton College Chapel, and the porter's lodge has undergone considerable repair and alteration. Mr. Jackson is the architect, and Messrs. Symm & Co. executed the work.

Repairs and alterations have also been carried out at Exeter College, and two stained-glass memorial windows have been fitted in the north side of the College Chapel. At University College the roof of the west side of the large Quad has been stripped of the old worn-out stone slates, and has been reslated with the Westmoreland sea-green slates. The old library has also been reslated partly with stone slates from the Launton Quarries. Messrs. Symm & Co. were entrusted with the work.

The new tutors' residence in connection with this college has just been completed. The house is built adjoining the College Library, and faces Grove Place, rather out of sight of the rest of the College buildings. The house contains all the usual accommodation of a large well-arranged private residence, and is built of local red bricks, with freestone dressings to the openings, &c. The design of the house is simple and well-proportioned, the entrance doorway, and some other features, being treated with good detail and ornament, bearing evidence that the design has been carefully carried out. Messrs. Wilkins & Sons, of Oxford, executed the building work, Mr. Moore, of Oxford, being the architect.

The new president's house at Trinity College has been completed. The principal doorway is in the centre of the south front. The chief doorway has a friezed pediment, and the spandrels are filled in with traceried carving. The two leading features of the south front are bays flanked with fluted pilasters with carved capitals at either end, carried right up to the gables which terminate with three ball ornament finials. On the north front three gables break the skyline, and these, like the others on the south, are carried up to the roof ridge. At the east end bays are carried to the stringcourse above the first floor, forming five sides of an octagon, and looking into the lime-tree walk. The gables here are varied with the scalloped ornament conspicuous in several of Mr. T. G. Jackson's (the architect) recent works in the city—notably in the east front of the new schools in the High. The extent of the house over all is 90 feet by 43 feet. There are six rooms on the top floor. Clipsham stone, with Doulton dressings, has been employed for the exterior walls, and the roof is covered with Colley-Weston slates. Homan & Rogers's patent fireproof material is used in the basement and ground floors. The principal staircase is of wood, and that for the servants of stone. At Magdalen College, the residence of the president has also been finished, and was occupied a few days since.

At Brasenose College considerable progress has been made with the new block facing High Street between Ratcliffe Lane and Amsterdam Court, the roof timbers being already *in situ*, and when finished it will be a striking addition to the architectural features of High Street. The present structure consists of a new house for the principal and five sets for undergraduates, an imposing tower being placed at the west end, beyond which there will eventually be an extension. The front elevation may be described as fifteenth-century Perpendicular, and will be 42 feet in height from the ground line to the roof-ridge. In the portion eastward of the tower there are four gables. The oriel windows on the first floor have a double light in front and a single one at each side, and they have a carved parapet and moulded finials. On the ground floor two and three-light windows are inserted alternately near the tower, while at the other end there are three of two lights. In the gables the windows are of four lights, the gables having moulded copings and carved finials. At the south-east angle the oriel has six lights, and an octagonal crotched spire will be carried nearly to the roof-ridge, adding considerably to the dignity of the building. In the east façade the windows of the ground floor are of three lights, while those in the first storey and gable are of two lights. The tower will be 62 feet in height, and under it is the main entrance formed with a fine Tudor archway, with a groined roof, leading into Amsterdam Quad. At the south-east angle there will be a turret, in which will be the staircase. The front door of the principal's house is in High Street, and on the groined floor are entrance hall, dining-room, and study. On the first floor there are two drawing-rooms, six bedrooms, dressing and bath rooms, and on the top floor seven more bedrooms. The premises extend some distance northwards, where the kitchen, servants' hall, and other offices are situated. All the north-west angle of the principal entrance under the tower is the porter's lodge, and access to the undergraduates' rooms is by the turret staircase. The scouts' rooms are in the basement. The stone used for facing is Handborough, while Clipsham and Doulton are used for the dressing. The cost is estimated at about 12,000/. Mr. T. G. Jackson, of London, is the architect, and Mr. Dobson, of Colchester, the contractor.

The work of the enlargement of Hertford College has been going on during the past year, and great progress has been



made. The new building is of Classic architecture, corresponding with the old wings on either side of it, being, however, more elaborate in design. The front entrance gateway is well designed. There are fluted columns with carved capitals on each side. The ornamentations are worthy of inspection, that on the right being a little boy carrying a basket of fruit, while on the other side there is a little boy carrying a boar's head. Above the doorway is some open tracery with a shield in the centre. The external elevation is designed so as to allow the steps inside to take the line of the window-sill. The outside arches are of a pear shape, and the strings and cornices take a raking line the same as the sills below it. At each angle of the octagon the fluted balusters have moulded bases and capitals running the whole height as far as the top cornices. Above this there is a battlement of inverted arches. The first floor storey is of rustic ashlar up to the string, and from this flooring rise four columns of moulded bases, surmounted by Corinthian capitals, the carving here again being very elaborate. Immediately above this there is a carved figure extending between the windows which light the hall in the common room. The carving represents stags running right and left, with foliage filling in the groundwork above. Above this there is some heavy balustrading, with balusters between each pedestal. Upon entering the archway into the quadrangle we find upon turning to the left a beautifully-designed staircase, which is very unique, and octagonal in shape, while on the right and left of the entrance archway leading from the quadrangle into Catherine Street is a column with moulded bases and capitals with pedimented head. Clipsham and Doulton stone have been used for the exterior of the building. The architect is Mr. T. G. Jackson. The builders are Messrs. Symm & Co., Oxford, Mr. E. Long being the clerk of the works.

A new lodge has been erected from designs furnished by Mr. Moore, architect, of Oxford, in the museum grounds adjoining the parks. It is built of stone to correspond with the other buildings, and proves a picturesque little building. The style varies rather from the Venetian character of the museum buildings, partaking more of English Gothic feeling. It is built of freestone, with red tile roof, and the work has been very carefully executed by the builders, Messrs. Colston & Plumridge, of Oxford.

The handsome building adjoining the new examination schools, erected for the delegacy of unattached students, has been finished. It consists of basement, ground floor, and two storeys above, 66 feet long, facing the High, and 35 feet over all from north to south. In the basement are porter's lodgings, a day room for non-collegiate students, lavatory, kitchen, offices, &c. On the ground floor are examination-rooms for the Oxford Local Examination and the delegacy, with a clerk's room. The largest of these is 35 feet by 15 feet, and the smaller 26 feet by 15 feet. The first floor is mainly devoted to the library, which is approached by a wide and handsome staircase, the dividing wall being opened by arches with circular heads. The library itself is 31 feet by 35 feet, and is divided by an arcade of three bays, with fine pillars on moulded bases, and the arches resting upon boldly-moulded caps. The remainder of the space is occupied by a censor's room, 24 feet square, and on the top floor there are tutors' rooms, the largest 23 feet by 24 feet. The elevation, as has been said, is certainly an improvement on that of the adjoining building, with the exception of the gable finials. At the extreme end of the High Street front the windows are of three lights with moulded mullions and transoms, the lights themselves with segmented heads of the Jacobean order. The spandrels are sunk. On either side of the entrance the windows are of a single light, of the same character. Above the doorway, and immediately below the first stringcourse, is a finely-carved frieze, running the whole length of the building, and between the first and second strings is a handsome arcading in the wall of three tiers, in the centre of each bay between the windows being carved shields. The windows on the first floor are pedimented double-transomed, and each of two lights, the spandrels below each transome being sunk. The three gables are carried up almost on a level with the roof-ridge. The King Street front is certainly effective, the leading feature being the octagonal oriel at the south-east angle. The lights are three, two, and single, but on the first floor there is a large pedimented four-light window, which effectively relieves the others and lends lightness to the gables. On the left flank in the top storey is a very handsome pedimented window with carved head and three lights double-transomed. The head over all the lights is circular, pear-shaped openings filling it, and on either side in the way are carved shields. The gable above the window is a carved finial, and immediately under the pitch of the roof is a carved frieze. The circular oriel rises from the angle on an octagonal corbel, and is covered with a handsome cupola and finial similar to those in the High Street front of the school. The chimney-stacks have moulded caps. Caen and Gibraltar stone with Corsham and Doulton have been employed, and the roof is covered with Naunton slates. The architect is Mr. T. G. Jackson. The old building which obstructed the view of the

east front of the school has been removed, and a low stone wall with moulded coping surmounted by wrought ironwork erected.

### DANGEROUS DUBLIN.

THE fall of a house in North Cumberland Street, Dublin, by the falling out of the back of the structure, which took place last week, has given rise to much comment. In reference to this, Mr. Thomas Drew, R.H.A., has written a letter to the *Irish Times*, as there seemed to have been suggested a want of due vigilance on the part of the municipal authorities.

Mr. Drew says:—May I, as one well acquainted with old and dangerous Dublin, offer an opinion that our municipal officers at least do their best under unprecedented difficulties to reduce the number of dangerous structures. In an immediate emergency they usually act with promptness, judgment, and experience, gained by long familiarity with as crazy and ill-built a city as could be found in the kingdom. The fact is that the evil of dangerous buildings has grown to be so widely extended, and is increasing at so alarming a rate, that it has already outgrown the ordinary capability of a municipal authority to deal with it.

What is the problem that the public officer of health and the city surveyor have to face? That if they were to condemn as widely as they ought in the case of every more or less risky old house, they must unhouse half the working population and poor of Dublin. Setting apart the public buildings, most of old eighteenth-century Dublin is on its last legs. Flimsily and ill-built as it was, one hundred years is an extreme limit of safe old age for an average house to run to. Even of houses built in this century many have already reached the last stages of decrepitude, and are unworthy of repair, risky, or absolutely dangerous. Old Dublin, as we have it, was chiefly built between 1750 and 1800. We are in the era when it is drawing near to universal dissolution. For every one dangerous house that existed a dozen years ago we have now ten. In five years we shall have twenty. In ten or fifteen years hence it is appalling to think of the risk to human life, not to speak of the misery of existence to many in this city that is impending, unless extraordinary remedial measures are adopted soon.

The city surveyor could not possibly acquaint himself with a tithe of the houses which are risky in some degree. They are numbered by thousands, and are not all in the poorer and neglected parts of the city. Many are in the leading streets, and occupied by well-to-do business people, and are fair enough to the outside as paint and putty and stucco, or a new front, can make them. He only who knows what is behind this in many a case has a conception of the widespread craziness, of the shaken and fissured side walls, the rotten rear walls with their rotten window-frames and sashes, and the unpaired, undrained, and unlighted cellars, with their accumulations of unsanitary horrors. To enter on house-to-house espionage of all this you must be prepared to face a sort of social rebellion, an outcry against inquisitorial and coercive measures from a class hitherto exempt from much control. In leading streets it has been a reprehensible practice in converting old domestic houses into shops, to cut away the supporting walls of the ground floor, and prop up the heavy superstructure of the front and rear walls and the chimney-breasts on a few miserable sticks of timber, which generally are soon decayed at their bearing near the ground. In the lower parts of the city rapid dissolution has set in in the foundations of houses in the last twenty years. The disuse of thousands of domestic pumps since the Vartry water was brought to Dublin leaves a large area of the city water-logged. The black calp stone in the foundations relapses under water to its original condition of soft mud. Such were the conditions, for instance, under which a house fell in Grafton Street not long ago.

I often think if the line of houses in the leading thoroughfare could be stripped for one day of their shop sashes, sign boards, and pilaster facings, which dress up but do nothing for the support of the structures, what a panic would set in when it was revealed to an ordinary observer what narrow margin exists in many cases between stability and catastrophe. It is true that much danger is averted by the jealousy of neighbours in watching other neighbours' fissures and signs of collapse which may affect themselves, and the skill of Dublin builders, familiar with risky structures, averts many a catastrophe at the last moment. Of course riskiness should never be let to run to be so near a thing as this, and municipal authority should absolutely prohibit the carrying of superstructures on dangerously insufficient piers or timber props, even by those who can afford to pay for emergency repairs. The case, however, of the old and rickety houses in poor streets, with impecunious owners and occupiers, still remains a more serious problem to embarrass municipal authority. It will so remain until for one thing legislation steps in to secure a better tenure and interest, and simplification of title and transfer to the occupiers of town holdings. Further, the problem of dealing with hundreds of



houses in Dublin, such as the one that fell in Cumberland Street on Monday, should be dealt with in an exceptional and urgent way, if within every year to come there is not to be increasing loss of life and misery to the poorer dwellers in this city. Special legislation alone will meet it. Risky houses must be more widely and unsparingly condemned. Hardships on impoverished owners of such properties, dangerous to the community, must be borne by some—title, tenure, and transfer of house property must be simplified. Powers should be given to the municipality to take possession of all derelict and waste places, inclusive of any which squatters with unprovable title have attempted to occupy in the olden city. Under such an exceptional condition of things means should be devised for a more rapid and wholesale housing of the poor dispossessed by demolitions. All that private enterprise and the working of existing Artisans' Dwellings Acts can do is wholly inadequate to meet the emergency in Dublin where such a crisis of houselessness is impending. To leave the administration in this heavy matter to the ordinary machinery of an official public officer of health, a city surveyor, and an inadequate staff of ordinary "inspectors" would be useless, in face of the facts that the evil has already gone beyond their ability to cope with it, and they have other and manifold routine duties already too onerous.

A special commission of high skill is wanted to deal with a great and exceptional social evil, and it should be armed with such legislative powers as have not yet had a precedent in any town of Great Britain or Ireland.

Mr. W. R. Maguire, writes:—My experience both as a sanitary engineer and as an old citizen agrees with this startling testimony. My business during sanitary inspections requires me specially to note the condition of the subsoil, the foundations, and the structure of houses. Every house should be capable of standing firm, erect, and independent on its own foundations. That such is not the case in Dublin may be aptly instanced by the fall of a house in Grafton Street (opposite the Provost's and next to Mr. North's premises), which collapsed soon after the neighbouring house had been taken down for rebuilding, and also by the state of my own business premises in Dawson Street about the same period, when we found the walls cut away exactly as described by Mr. Drew, and were compelled to rebuild thoroughly the rear and supporting walls. Our Corporation should possess ample powers and machinery to inspect all buildings, new and old, and to execute promptly all works necessary for the stability of the city and safety of the citizens. That such is not the case may be fairly inferred from the prolonged existence of the dangerous structure or ruin in Stephen's Green, at the corner of York Street. One has only to look from the top back window of any house, even in the best streets, to see the unsafe and rickety back walls of many houses. The present Corporation officials have their hands full. We want a new independent department and additional powers, as explained by Mr. Drew, and at the head of this department a first-class architect should be placed, whose art and experience has taught him to prefer sound building construction before ornamentation or picturesque effect.

Mr. Drew alludes to the fact that the complete cessation of the practice once universal in Dublin of pumping water daily from shallow wells for domestic use has allowed a permanent rise of impure subsoil water under large areas of this city. Twenty years ago, at the period of this cessation, the vast majority of drains under houses were formed of pervious built brick or stonework. Now we have the majority of house-drains formed of impervious pipes with cement joints, which, if properly constructed, provide no escape for subsoil water, nor in the vast majority of cases are any proper means adopted to render the subsoil safe and dry. The old built drains while admitting foul sewer air freely into houses, made some amends to householders by very effectually draining off subsoil waters through numerous defects in brick or stonework, except in frequent cases where drain stoppage occurred, or in low lying districts where the tides backed up and saturated the subsoil with returning foul drainage through leaking drain walls. It is in cases of this description that the bad effects arise which your correspondent "Pro re natâ" mentions and asks a remedy for, as being an evil of greater note than that of crumbling houses. The subsoil is dry and drained, but foul emanations, nevertheless, proceed therefrom, and rise through the house. Many Dublin houses stand on this dangerously drained dry subsoil still, and many more stand on a subsoil saturated with foul stagnant water even in the best parts of Dublin, which are often described in advertisements as having their "drainage perfect." There is a simple remedy for this dangerous condition of the drainage and subsoil which any architect or sanitary engineer ought to be able to provide if applied to in the ordinary way of business, not, however, through newspaper correspondence, which, though drawing public attention to such evils, cannot fairly be asked to take the engineer's place and furnish specifications for works to be done.

As the Lord Mayor and Corporation are about investigating

the constructive safety of Dublin houses, there is one point concerning house-drainage of a technical but extremely practical and important character I again beg to draw attention to specially. I have already done so more fully in a paper read before the Sanitary Congress, which can be still obtained. Here I shall only say that the connecting pieces or junctions on the main sewers are wrongly placed opposite the hall-door steps and scullery in the great majority of Dublin houses, so that it is almost always impossible to provide a straight line of house drain, as it should be laid, from the back area to the front area. It is of very great importance to health that the house drain should pass out across and under the front area straight to the public sewer, instead of, as at present, being carried, with many bends, out under the scullery and hall-door steps. There is not space to explain the reasons or give diagrams, but I believe that if the right course was followed in this simple matter in Dublin, the death-rate would be lowered very remarkably indeed.

#### THE LATE MR. THOMAS S. MUIR.

THE death of Mr. Thomas S. Muir took place on the 10th inst., at Albany Street, Leith. The *Scotsman* says the announcement of the death of Mr. Muir will be received with regret by many readers, not only in Edinburgh, but in the remotest corners of Scotland and throughout the Isles of the Northern and Western Seas. Born on January 1, 1803, he has passed to his rest at the ripe age of eighty-five years. He received a good education, and during the early part of his life mixed in the best society, when it was the fashion for gentlemen to go out to dinner in a sedan-chair, and place their own spice-boxes by their plates at table. But as he came to maturer years he relinquished social enjoyments, and became absorbed in the one pursuit which was ever afterwards the passionate devotion of his life. He was not an antiquary in the ordinary acceptance of the term, and he had no special regard for the dry-as-dusts as a body; but he was possessed by an intense desire to popularise the subject of ecclesiology in Scotland, and to this object he steadily devoted his means and his leisure for more than forty years. With an inborn love for ecclesiastical architecture, he made the remains of the early Scottish churches his peculiar study, and was the first to systematise and make plain to the popular understanding the distinctive features of the different styles and periods in Scotland.

The little volume, now rarely to be met with, entitled "Notices of some of the Ancient Parochial and Collegiate Churches of Scotland," which was issued by Messrs. Parker, of London, in 1848, was his first literary venture. It was succeeded by a second essay, published by J. Lendrum, Hanover Street, Edinburgh, in 1855, and entitled "Notes on Remains of Ecclesiastical Architecture and Sculptured Memorials in the South of Scotland." Neither of these ventures succeeded to his anticipations, but in 1861 a third work, wider in scope and better illustrated—"The Characteristics of Old Church Architecture on the Mainland and Western Islands of Scotland"—was published by Messrs. Edmonston & Douglas, and met with a much more cordial reception. In the meantime, he had given himself to the task of visiting every undescribed ecclesiastical ruin in the country—no matter where it was, or whether there was anything left in the way of architectural characteristics to be described. However inaccessibly placed it might be, it had to be seen, and if it had nothing else, it had a ground plan, or part of one, which could be placed on record for comparison with others. The utterly neglected and unknown churches in the remoter districts of the Highlands and islands had a peculiar attraction for him. Although they were rudely constructed, their plans often exhibited features which gave rise to unsolved questions as to the succession of typical forms in the history of ecclesiastical architecture, while in almost every case their graveyards were studded with monumental sculptures. Wherever he went—and he went everywhere—he left no ruin undescribed and no monument unnoted. Of the better preserved ruins he made carefully measured plans, and of the more ornate monuments he made equally careful rubbings. His sketches of ruins and monuments, whether with pen or pencil, are faithful and full of character. When on these journeys, usually in the months when the days are long and the twilight lengthens into day, neither stormy weather, sea-sickness (to which he was occasionally subject), nor semi-starvation could deter him from his purpose. Many an adventurous boat he launched by the persistency of his persuasive tongue, when the unwilling boatmen would fain have waited for a better day; and many a droll scrape he and they got into, with the weather, and the tide, and the fading daylight, and the improvidence of trusting to be back in time for supper. He went twice to North Rona and the Sule Skerry; the Shiant Isles, the Hannan Isles, St. Kilda, Foula, and Fair Isle, all tempted him in turn; and in



the years between 1850 and 1872 there was not a nook in all the Highlands, nor an islet in the Northern and Western Seas that was likely to retain a trace of an ecclesiastical ruin that he had not visited. His journeys were always made alone and on foot, in his annual holidays—all too brief for the objects to be crowded into them before the return to business.

Perhaps there was nothing more characteristic of the man than the ease with which on these occasions he shook off the impeding habits of a town life—taking whatever kind of food he could get as the opportunity presented itself, sleeping under any shelter or none, and foregoing the customary solace of a pipe, which was a quite regular habit in his ordinary life. Stranger than all, he did occasionally provide for the possibility of being cast away on some lonely isle, and laboriously carried with him to the most outlandish places a barrel packed with eatables, delicacies in due proportion, and drinkables on similar terms—a bottle or two of choice Madeira or claret—which were after all most carefully brought back again. Readers of his inimitable little sketches knowing this will read into some of them “the fun of the thing,” as he himself occasionally saw it. On such excursions he was a most interesting companion to meet with, though he sought no companionship he could readily avoid. No one could make much of him till his object for the day had been attained; but he was always cheerful and chatty in the evenings, whether he found shelter in the shieling or the hut, in the manse or in the mansion-house, as sometimes happened. Yet, after such delightful intercourse, which might have been expected in many instances to ripen into warmer friendship, he was off like a shot in the morning on some other outlandish expedition. Thus, although many were attracted by his peculiarly lovable and interesting character, he was shy of forming friendships on general terms, and it was only given to a very few to know the sweetness and light that lay concealed under the hesitancy and reserve of his ordinary manner.

The results of these solitary journeys of exploration were embodied from time to time in a series of booklets, nine or ten in number, now well known to collectors. These he wrote and printed privately as the spirit moved him, sometimes illustrating them with woodcuts made with special care and supervision from his own drawings, sometimes with etchings by himself; and at other times the booklet was printed with blank spaces in the type for certain illustrations which could neither be entrusted to the woodcutter nor to the etching-plate, but were afterwards filled in with drawings in pen and ink. They were mostly limp quartos, sometimes covered in black glazed cloth, and sometimes in unbleached canvas, and as they were occasionally limited to an impression of twenty-five copies, the appearance of one or other of them at rare intervals in an auction-room, and the competition for them at such fabulous prices as they brought, afforded him no small delectation. These were all collected in one volume, with an introductory chapter, not previously printed, giving a *résumé* of the whole of his wanderings among the islands, which was issued by Mr. David Douglas in 1885.

Apart from their scientific value, Mr. Muir's sketches are full of character, enlivened by the genial sayings of one “who, instead of worrying you to his theme, simply woos you to it, and leaves you to worry out for yourself what it is like and what it is worth.” Child-like himself, he delighted in the company of children. It gives a curious insight into this phase of his character to note how he hit upon that singular conjunction of his two favourite enjoyments which led him to appear before the public—the very last thing that he would ever have thought of had it not been for an object so dear to his heart. Admitting no one to his confidence but his small and very familiar friends, he made the boldest venture of his life—a public exhibition of his far-gathered “Rubbings.” The idea was that there would be a rush of antiquaries and other curious people to “the show,” and a big bag of shillings to be carried in triumph to the Sick Children's Hospital. So in November 1871 he took one of the public halls, pinned up his exhibits in black-and-white with anxious care, printed a catalogue—a really valuable monograph of the subject—advertised in the newspapers, and waited the result, which he afterwards described so humorously in one of his sketches as “not precisely a failure.”

It is also a characteristic indication of his extreme modesty that his name does not appear on the title-page of any of his books except the last, and in this case not by his own desire.

During the greater part of his life he was bookkeeper to Walter Cockburn, West India merchant, Edinburgh; afterwards for a few years to his son, Isaac H. Cockburn, Leith; thereafter he managed the estate of Melville Hall, in Dominica, the property of the late John Whyte Melville, of St. Andrews. A small legacy from his old master and what he earned sufficed for the wants of a very frugal life, in which all his spare means were devoted to the expenses of his many journeys and his little books.

#### KIRKSTALL ABBEY.

AT the meeting of the Leeds Town Council, on Thursday last week, Mr. E. Wilson proposed a resolution that the Council should purchase Kirkstall Abbey and the enclosure, containing about twelve acres of land, subject to the existing lease to the late Mr. Butler, provided they could acquire it for 6,000*l*. There was no one, he said, in Leeds who was not well acquainted with Kirkstall Abbey, but possibly there were many so well acquainted with it that they did not recognise what a splendid ruin they had in their midst. There were not more than two of the ruined abbeys in Yorkshire which could be placed before Kirkstall in order of merit. There was no one present, he was sure, who would not raise his hand against any suggestion that Kirkstall Abbey should be in any way destroyed or prejudiced, and yet it was a fact that from neglect that ruin was perishing day by day. Those who had been to see it, and had compared its appearance now with what it was when they were younger, were struck to see how rapidly it was decaying. Something must be done; for, under the present ownership, little or nothing was likely to be done. Mr. Butler had taken a lease which would last till 1893. They were told that the abbey was going into the market, and in all probability it would change hands. It had therefore occurred to him, and he hoped the idea would be supported by every member present, if the ruin was to change hands, the Corporation of Leeds were the proper persons to own it. They had been urged for some time past to provide a recreation-ground on that side of the town, though whether it was a suitable place for the erection of swings and other popular institutions he did not know. He had for a long time been in negotiation for the purchase of the abbey, with a view to being able to offer it to the Corporation, and he had arrived at a price with the agent. But a committee of gentlemen, who also were endeavouring to secure the abbey, on learning from him of the arrangement made, had gone to the agent and offered 500*l*. more, so that it had been decided to bring it to the hammer. He did not know how that might strike them as commercial gentlemen. He did not know now whether the abbey could be acquired for 6,000*l*.; but it would be foolish to go prepared with a less price, because that sum had already been offered, while it would be unwise to suggest a less sum.

Mr. A. Cooke seconded the resolution.

Mr. John Gordon expressed his opinion that they would be unable to purchase the abbey by private treaty. He and a number of other gentlemen had been endeavouring to purchase another portion of the Cardigan estate, but the trustees had laid down a strict line and declined to have any negotiations, being determined that it should go to the auction sale. He had not the slightest doubt that they would get the estate for 5,000*l*.; the only fear was that some one might come and keep them out of it. The public of Leeds would give them a free hand and keep out of their way, and all they had to be afraid of was the speculator. Still he did not think any man devoid of sentimental feeling would give as much as 6,000*l*. merely as a speculation. He suggested that the necessary steps towards completing the purchase should be left in the hands of Mr. Wilson.

Mr. Arnold Lupton seconded the suggestion.

Mr. Wilson said the owners of the estate attached, or desired to attach, to the sale some obligation to preserve it. He did not mean to say the property was to be kept exactly in its present state for ever, but that the land was not to be built upon, and that the ruin was not to be destroyed.

The resolution was adopted, with the understanding that Mr. Wilson, Sir E. Gaunt, and the town clerk should be authorised to make arrangements for the purchase.

#### EXHIBITION OF DECORATIVE HANDIWORK.

SOME months ago it was suggested, the *Scotsman* says, that the cause of artistic handicraft in Edinburgh and in Scotland generally might be usefully advanced by the holding of an exhibition of decorative work in its various branches. It was pointed out at the first meeting held to consider the project that there is little or no help available for the craftsman who wishes to improve the artistic character of his work, and to advance beyond the limits of ordinary workshop practice. Though he may have gained in early life some artistic knowledge and skill at the School of Art, when he settles down to the business of his craft he is left pretty much to himself. It was felt that a useful stimulus would be given to his efforts if he were afforded the opportunity of displaying what he could do in really artistic work when freed from the moment from the mere pressure of trade demands, while he might be further aided by bringing under his notice standard examples produced in the best periods of the past. To evoke



the interest of the public in genuine handiwork as distinct from the products of the machine was a further aim of the promoters. The scheme, started upon these lines, found ready support both among public bodies connected with art, commerce, and handicrafts, and private persons, who were prepared "to further in a practical way the education both of workers and of the public, and so to promote a purer taste and better appreciation of what is really good in the important branches of industry that connect themselves with art." The Board of Manufactures kindly granted the use of the Royal Scottish Academy Galleries, where the exhibition will be opened in the early part of the month of November. In accordance with the original scheme, the exhibition will be divided into two sections. In the first, craftsmen, whether professional or amateur, are asked to exhibit specimens of their skill, or to compete for prizes in various classes of work, including carving in wood, plaster, stone, and marble; painted decoration, the adornment of books and their covers, metal-work of different kinds, turnery, mosaic, and embroidery; while in the second a collection of artistic productions on loan will be brought together, supplying, as far as possible, "standard examples in the various special forms of work in which competitions are held." This loan collection, excellent materials for which have been kindly promised from various quarters, is also intended, by judicious arrangement, to afford in itself an instructive and beautiful exhibition. The rules provide that "originality of design will be considered in judging the merit of works submitted in competition," while "work submitted in competition must in every case be solely the work of the competitor," so it may be hoped that genuine craftsman's work, with some character and individuality about it, will be well represented in the Galleries. It is proposed to hold a short series of lectures in connection with the exhibition on subjects interesting to the public, but at the same time bearing on the practical life of the workman; and, should space allow, the operations of some of the simpler handicrafts may be illustrated by workmen engaged on the actual processes of modelling, carving, or chasing.

#### THE LATE JOHN FOWLER, C.E.

THE death is announced of Mr. John Fowler, C.E., at his residence, Preston-on-Tees, on the 11th inst., at the age of sixty-four, after a somewhat protracted illness, the deceased gentleman having, during the past few years, had to go through a number of painful operations. Mr. Fowler was a native of Aberdeen, having originally been a gardener. After spending some time in the South of England, he came to Tees-side, where his half-brother, Mr. James Johnston, was engineer to the Old Tees Navigation Company. In the year 1854 Mr. Johnston died, and Mr. Fowler, who for seven years had acted as assistant, was appointed engineer to the Tees Conservancy Commissioners. Since that time Mr. Fowler has held the position of chief engineer to the Commissioners till a few months since, when he was appointed consulting engineer. It has been under his direction that all the great works and improvements on the river Tees have been carried out, and the majority of them were conceived and originated by him. Mr. Fowler's knowledge was also requisitioned for the great river and canal undertakings in the kingdom. In connection with the Manchester Ship Canal, he gave evidence in its favour. For the improvements on the Ribble, too, he was also called in to express his opinion. As the engineer, he has tendered reports and executed many important undertakings in connection with the Ouse and Foss scheme. His last chief work was the construction of the new lock at Naburn. Mr. Fowler's son is now superintending the enlargement of the Castle Mills Bridge Lock.



#### Portland Stone in London.

SIR,—Mr. Francis Chambers commences his letter (*The Architect*, October 12) in reply to mine in the *Times* of October 1 (*The Monument*), with these words:—"The letter . . . contains statements so contrary to my experience . . . that I am induced to ask the insertion of a protest." I shall be glad to say a few words. In the first place, I think "the protest" a very weak one, for it should have been well supported by a few proofs rather than his own personal opinion. It is made in these words:—"I believe Portland stone to be the best build-

ing stone for use in London; it is less affected by the atmosphere than any other;" but he goes on to say, "It is dissolved or worn down very gradually and evenly," and further on he says that, in 1793, a painter applied the residuum of his pot to a stone, with the effect of preserving it, whereas the surface of surrounding stone, twenty-five years ago when he saw it, was reduced one-eighth of an inch. For my own part I have little doubt that the reduction during this twenty-five years has been going on at greatly accelerated speed, because it is in these modern days of immensely increased population and manufactories that the chemistry of the air has been so entirely changed as a destructive agent. In Wren's time London air was not much worse than that of a village; now it is highly charged with ammonia, nitric acid, sulphur, hydrochloric acid, carburetted hydrogen, carbonic acid, and many other gases; and in my letter I remarked:—"We might as well expect water and oil to mix as that limestone and hydrochloric acid . . . could live together harmlessly. Wren used the best material available in his day; but it cannot be doubted that, if living now, he would have rejected the Portland stone he used in favour of Craigleith—a carboniferous sandstone almost equal in durability to granite . . . or perhaps of granite itself, like the Duke of York's Column on Carlton House Terrace. These considerations seem to point out that it would be very undesirable to repair the Monument on Fish Street Hill with the perishable material of which it is built." And I am compelled to think so still, notwithstanding Mr. Chambers's "protest," and simply because Craigleith stone contains 98 per cent. of everlasting silica, and Portland 95 per cent. of perishable carbonate of lime.

But, further, I am at a loss to understand how, if Portland is "the best stone for use in London," so many other kinds have been introduced here during recent years. Very strong reasons must exist, for the Isle of Portland is only half the distance of these quarries, and has the economical advantage of cheap sea freight. In conclusion, I may admit that I admire Portland stone as much, perhaps, as Mr. Chambers, but I would not use it in the metropolis because it is exceedingly absorbent of moisture, and the acids I have referred to are solvent in rain, and, therefore, in due time find their way into the very heart of the stone of the exterior of buildings, causing disintegration by chemical action, and fractures by mechanical action during sudden changes of temperature in winter. I am inclined to think this last power greater than that of the iron clamps. As you are aware, Mr. Editor, my remedy for this mischief is the more general use in London of the igneous rocks, which are alike indestructible, beautiful, and economical, because they will never require costly restoration—of course combined with a style of architecture adapted to the nature of the material, which yet remains to be determined.—Yours truly,

HENRY TRAVIS.

#### CHURCH BUILDING AND RESTORATION.

**Kirkby Mallory.**—The ancient parish church of All Saints, Kirkby Mallory, near Hinckley, Leicestershire, was reopened after extensive repairs and additions on October 11. The date of the first church on this site is uncertain, but the existing building was erected in the thirteenth century, and now consists of nave, tower, and chancel. During the progress of the works several interesting discoveries were made. The plaster ceilings, put in probably at the end of the seventeenth century, having become decayed and dangerous had to be taken down, when the old roof principals and timbers were exposed. These have been carefully restored and made good as originally built. In building the new organ chamber and vestry, the arches and piers of an old chancel aisle were discovered built up in the wall. These have been opened, and form the communication between the organ chamber and chancel. It was also found that the walls of the nave contained on either side the arches and piers of an arcade, showing that originally the church comprised nave, aisles, chancel, chancel aisles, and tower, &c. The gallery at the west end has been removed, and the tower arch opened into the church. There are several interesting ancient monuments to members of the families of Byron, Noel, Clobbery, and others. The work of restoration will be continued as funds permit. Messrs. T. & H. Herbert, Leicester, were the builders, and Messrs. Osborn & Reading, of Birmingham, the architects.

**Upper Helmsley.**—The parish church of Upper Helmsley, near York, has been reopened, after having been rebuilt upon its old foundations. The alterations have been carried out in accordance with plans prepared by Mr. M. W. Lewis, of the firm of William Lewis & Son, architects, York. The original edifice was built in the ninth century, after the Norman style of architecture, and naturally had become decayed by the



ravages of time. In carrying out the work the architect has faithfully reproduced the Norman characteristics of the church. The exterior is of Breckon Hill stone, and the interior of stone from the Ancaster quarries, with Norman enrichments. The roof is slated with Westmoreland slates. The interior roofing, wood fittings and seats are of pitch pine. The floor is laid with marble mosaic in keeping with the date of the building, the mosaic work being richer in tracery at the east end.

### GENERAL.

**Mr. E. H. Dawson, A.R.I.B.A.**, of Lancaster, has been instructed to carry out his plans for new workshops at the Lancaster County Asylum, at a cost of about 4,000*l*.

**Mr. R. J. Richardson, C.E.**, read a paper on the Forth Bridge at the meeting of the Mason College Engineering Society, in Birmingham, last week.

**Canon Eyre**, vicar of St. Helens, has received from a resident in the town the money necessary to build a church, the erection of which will be commenced before long.

**Mr. G. H. Boughton, A.R.A.**, has returned from a sojourn in Norfolk, bringing back with him a number of studies to be worked out for the spring exhibitions.

**Mr. Alan Cole** on Tuesday evening gave a lecture at the Limerick Chamber of Commerce in support of a movement to revive the Irish lace industry, and suggested the establishment in Limerick of a school of art.

**Mr. P. Burne-Jones** is about to paint a small-scale portrait of Mr. Watts, R.A., as engaged on his large equestrian statue.

**Mr. P. H. Rathbone** will, on the evenings of November 7, 14 and 21, deliver a course of lectures on "Art, the Expression of a Nation's Character and Aspirations," in the Rotunda Hall, Liverpool.

**Mr. Fridgin Teale** will give a lecture at Northampton on "Sanitation" on Friday (to-day).

**The Statue of General Gordon**, by Mr. Hamo Thornycroft, A.R.A., was unveiled in Trafalgar Square on Tuesday.

**A Bazaar** in aid of the funds for the erection of the Victoria Art Galleries, Dundee, was closed on Saturday, after being opened four days. The total sum realised amounts to 4,748*l*.

**A Survey** is being made by Mr. Baldwin Latham for the extension of the water-supply at Bideford.

**The Carlisle School Board** have decided to build an infants' school for 300, and provision is to be made for the erection of a boys' and girls' department on the same site.

**A Memorial Painting** to the late vicar of Titchfield, representing *The Miraculous Draught of Fishes*, has been completed for the church by Mr. Alexander Fisher.

**Professor Ramsay**, of the Aberdeen University, is a candidate for the chair of classical archaeology in London, vacant by the resignation of Sir Charles Newton.

**A Portrait** of Charles Swain, the poet, by William Bradley, has been presented to the Manchester Art Gallery.

**A Bronze Statue of Shakespeare**, presented by Sir W. Knighton, president of the International Literary Association in Paris, was unveiled in that city this week.

**A Monument** of the late Monsignor Dupanloup, designed by M. Chapu, has just been inaugurated in Orleans Cathedral.

**At the Meeting** of the Manchester Literary Club last week a paper on "Lawrence, the Portrait-painter," was read by Mr. Richard Hooke.

**The Lord Mayor of Dublin** has requested the borough surveyor to prepare a report on the condition of dwelling-houses in Dublin, and on any measures required, either by amendment of the law or otherwise, to provide for the safety of life.

**The Free Library and Picture Gallery** which has been built from the designs of Mr. W. H. Lynn, in the Royal Avenue, Belfast, was formally opened on Saturday.

**An Exhibition** of pictures by the Aberdeen Artists' Society will be opened in the Corporation Art Gallery about Dec. 10.

**The West Riding Magistrates** on Monday awarded a second grant of 1,000*l*. as a present to Mr. J. Vickers Edwards, the West Riding surveyor, in consideration of important services in connection with the building of Menston Asylum.

**An Exhibition** of pictures, the best collection ever brought together in the town, it is said, has been opened in the Drill Hall, Basingstoke. A considerable number of the works are by students of Mr. H. Herkomer, A.R.A.

**A Technical Institute**, designed by Mr. Murray Robertson, and which has been built and endowed by funds bequeathed by the late Sir David Baxter, was formally opened on Monday.

**The Birmingham Art-circle Exhibition** was opened on Tuesday to the public. Fifty pictures have been brought together, but there are many of the members unrepresented, some few of them from illness or absence from England.

**A Carved Walnut Reredos and Altar** and wrought-iron sanctuary screens, executed from the designs of Messrs. Preston & Vaughan, of Manchester and Stockport, were unveiled on Sunday at All Saints Church, Heaton Norris.

**Bedworth Parish Church** has been handed over to Mr. J. Thompson, of Peterborough, for rebuilding. Messrs. Bodley & Garner are the architects for the restoration.

**The Committee of Art Classes** in Peterhead have decided to start advanced classes for higher instruction to students of drawing, painting, &c.

**The Prizes Awarded** in connection with a series of competitions in "vacation sketches" were presented by Lady King on Friday to the successful students of the Glasgow School of Art Club.

**A Paper** on "Glass Painting," a sketch of the history of the craft from the earliest down to the present time, was read by Mr. J. V. Rowlands at the last meeting of the Liverpool Art-Workers' Guild.

**The York Municipal Offices Committee** have recommended the construction of a Council Chamber at the Guildhall, with a gallery capable of accommodating a hundred persons, and to remove the police business to the new police premises in Clifford Street. It is estimated that this arrangement will save the city nearly 20,000*l*., by avoiding the erection of municipal buildings in another part of the city.

**Alterations** have been made at the celebrated Ship Hotel, Greenwich, of Whitebait Dinner renown, embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

**The Hove Commissioners**, at their meeting on Saturday, passed a resolution in favour of carrying out, at the public cost, a new sea wall and esplanade at West Hove, in extension of what is locally known as the Medina "quarter deck." In connection with this it is proposed to erect extensive baths and club-room from the designs of Mr. P. B. Chambers, the engineering details being furnished by Messrs. Thomas Bradford & Co. We understand that it is largely due to the enterprising action of Mr. Alexander Hill, of the firm of Messrs. Tooth & Co., that this improvement has been secured for Hove.

**A Meeting of the Committee** of the Holland testimonial was held in Worcester on Saturday, when a letter from Mr. Oules, R.A., was read, stating he was unwilling to accept the commission which had been offered him in consequence of the death of Mr. Holland, but that he would be willing to help to choose an artist, and also aid him from his remembrance of Mr. Holland. It was decided to apply to Mr. Haynes Williams, and also suggested that the surplus money, after presentation to Mrs. Holland of the portrait, should be used for establishing Holland scholarships at the Victoria Institute.

**Mr. W. H. Cheadle**, of Stafford, was on Tuesday appointed county surveyor for Staffordshire. At the meeting of the county magistrates on the same occasion, Mr. Frank James pointed out that the county surveyor had not only to look after the county property, but was also the architect for the county, for which he received an independent commission. He thought it was not right that the personal interest of the county surveyor should be in some degree antagonistic to the county; and on his motion a resolution was passed approving of an alteration in the rules under which the county surveyor was appointed, and to which the newly-appointed surveyor would be subject, the further consideration of the matter being left to a committee.

**The Carpenters' Company** have, with the view of inducing candidates to do better practical work at the City and Guilds of London examinations, offered to purchase specimens of carpentry, should they be recommended by the examiner, and they have just purchased four models. The examiner, Mr. Banister Fletcher, F.R.I.B.A., in his report mentioned that usefulness of the models depends upon their practical size and the power of taking them to pieces so that the joints may be examined by the students. The Carpenters' Company have also opened a "Free Technical Lending Library" for the benefit of competitors for the above examinations, and for the more advanced examination of the Carpenters' Company.

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A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, OCTOBER 19, 1888.

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*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

### TENDERS ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

### NOTICE TO THE PUBLIC.

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Our readers are invited to address us on subjects of interest to themselves or the public. We shall be always ready to insert letters asking for a solution of any suitable questions to a professional or practical nature, and to receive replies of such inquiries.

### CONTRACTS OPEN.

BELFAST.—Oct. 22.—For Construction of Lock for the Lagan Navigation Company. Messrs. S. & W. H. Stephens, 41 Donegall Place, Belfast.

BISHOP'S CASTLE.—Oct. 27.—For Construction of Water-works in the Borough. Mr. Aaron Hamar, Borough Surveyor, Bishop's Castle.

BISHOPWEARMOUTH.—Oct. 20.—For Erection of School Buildings at the Grange. Mr. T. W. Bryers, Clerk to the School Board, 15 John Street, Sunderland.

CAMBERWELL.—Oct. 31.—For Extension of Infirmary, Havil Street, for the Guardians. Mr. R. P. Whellock, Architect, 45 Finsbury Pavement, E.C.

CARDIFF.—Oct. 23.—For Restoration of Llancafarn Church Tower. Messrs. Seddon & Carter, Architects, 7 St. Mary Street, Cardiff.

COCKERMOUTH.—Oct. 24.—For Heightening Boundary Walls at Board School, Wyndham Row. Mr. John Musgrave, Clerk to the School Board, Cockermouth.

EAGLEY.—Oct. 25.—For Building Boundary Wall at Sewage Works and Retaining Wall to River Eagley. Mr. James Parkinson, Surveyor, 50 Station Road, Turton.

GLUSBURN.—Oct. 22.—For Building Stone Chimney (50 yards high), Hayfield Mills. Messrs. Petty & Ives, Architects, Halifax.

HARROGATE.—Oct. 23.—For Building Lecture Room, Chapelkeeper's House, Boundary Walls, &c. Messrs. Morley & Woodhouse, Architects, 269 Swan Arcade, Bradford.

HASWELL.—Oct. 27.—For Building Manager's House and Shop. Mr. H. Hind, Secretary, Co-operative Provision Society, Haswell.

HELSTON.—Oct. 20.—For Construction of Storage Reservoir at Tregathenan, and Laying Main Pipes (four miles). Mr. S. W. Jenkin, C.E., Liskeard.

LEEDS.—Oct. 29.—For Enlarging Board School. Mr. Lee, Clerk to the Board.

LIMERICK.—Oct. 25.—For Building Constabulary Barrack. Office of Public Works, Dublin.

RAMSEY.—Oct. 22.—For Construction of Sewage Outfall Works. Mr. J. Mansergh, Engineer, 3 Westminster Chambers, Victoria Street, Westminster.

SEASCALE.—Oct. 20.—For Building Two Dwelling-houses, Warehouse, Large Room, Stabling, and Coach-house. Messrs. J. Wrigley & Sons, Seascale.

STOKE-ON-TRENT.—Oct. 29.—For Alterations and Additions to Penkull Schools. Messrs. Scrivener & Sons, Architects, Howard Place, Hanley.

WEST BROMWICH.—Oct. 23.—For Laying Cast-iron and Earthenware Pipes with Manholes, Ventilators, &c. Mr. John T. Eayrs, Borough Engineer, Town Hall, West Bromwich.

WITHINGTON.—Oct. 26.—For Building Mortuary at Union Workhouse. Messrs. Mangnall & Littlewoods, Architects, 29 Brown Street, Manchester.

WORCESTER.—Oct. 31.—For Making Sewers and Works in connection. The City Surveyor, Guildhall, Worcester.



## TENDERS.

## BOURNEMOUTH.

For Enlargement of the East Cliff Congregational Church and Schools, Bournemouth. Messrs. LAWSON & DONKIN, Architects, Bournemouth. Quantities not supplied.

Barrow & Entwisle, Bournemouth	£4,595	0	0
McWilliam & Son, Bournemouth	4,385	0	0
George & Harding, Bournemouth	4,225	0	0
Jenkins & Son, Bournemouth	4,017	0	0
J. W. MANNELL,* Bournemouth	3,660	0	0

\* Accepted subject to modifications.

## BRIGHTON.

For Building Public Elementary Schools for 700 Children, near Park Road, for the Brighton and Preston School Board. Mr. THOMAS SIMPSON, Architect, Brighton. Quantities by the Architect.

J. J. G. Saunders, Brighton	£10,129	18	0
G. R. Lockyer, Brighton	8,753	0	0
Longley & Sons, Crawley	8,681	0	0
J. Barnes, Brighton	8,440	0	0
A. Dean, Brighton	8,397	0	0
W. Taylor, Brighton	8,218	0	0
J. T. Chappell, London	8,114	0	0
Stimpson & Co., London	7,962	0	0

For Caretaker's House on Site of New Schools, Park Road, Brighton.

Saunders	£804	0	0
Lockyer	611	0	0
Longley	603	0	0
Dean	598	0	0
Barnes	580	0	0
Chappell	573	0	0
Stimpson	570	0	0
Taylor	520	0	0

## BIRMINGHAM.

For Heating the new Board Schools, West Hill. Mr. EVANS, Architect, Birmingham.  
John Grundy, London and Tyldesley.

## BROMLEY.

For Erection of a Residence in the Highland Road, Bromley Park Estate, for Mr. G. Kitchen. Mr. W. A. WILLIAMS, Architect, Bromley and London. Quantities by Mr. William Mills and A. T. Cooke, of 26 Budge Row, City, E.C.

Douglas Payne, Bromley	£3,581	0	0
Thomas Crossley, Bromley	3,446	0	0
J. C. Arnaud & Son, Bromley	3,397	0	0
T. Gregory & Co., Clapham	3,377	0	0
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For Heating St. Luke's Church, Cork. Mr. W. H. HILL, Architect, Cork.

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For Heating St. Kevin's new Church, Dublin. Mr. THOS. DREW, R.H.A., Architect, Dublin.

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For Building Cookery Classroom at Board School, Charlotteville, Guildford. Mr. WILLIAM G. LOWER, Architect.

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Stanley Ellis, Guildford	179	0	0
R. WOOD, Cobham (accepted)	148	0	0

## HOLMFIRTH.

For Proposed Alterations and Reseating of Lane Independent Chapel, Holmfirth. Mr. J. BERRY, Architect, 9 Queen Street, Huddersfield.

## Accepted Tenders.

F. Marsden & Sons, Bingley Quarries, Holmfirth, masons.  
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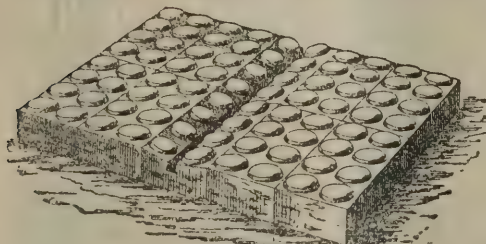
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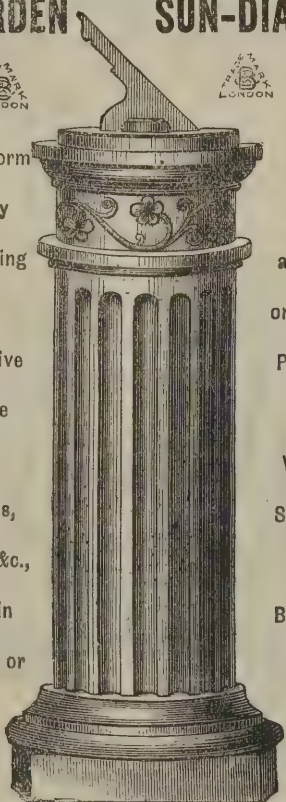
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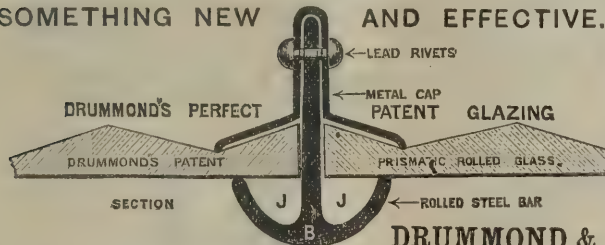
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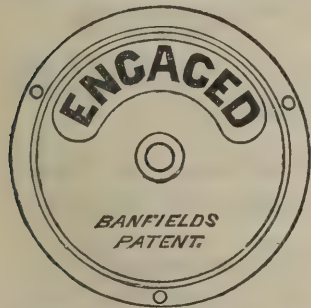
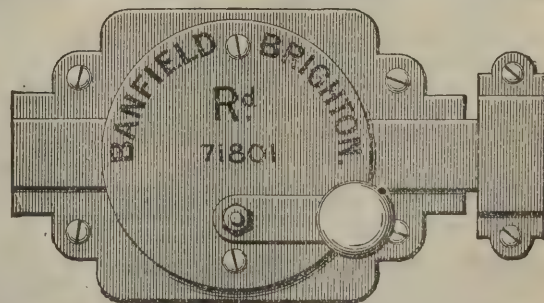
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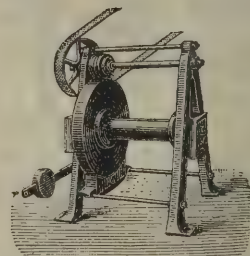
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Woodward	8,116	0	0
Morter	8,079	0	0
James	7,900	0	0
W. Shepherd	7,885	0	0
Dove	7,875	0	0
Kilby & Gayford	7,860	0	0
Treasure & Son	7,648	0	0

Screens (Gallery, Front and Seats are in Pitch Pine).

Ashby Bros.	8,600	0	0
Nightingale	8,480	0	0
Messum	8,248	0	0
Dove	7,825	0	0
Goodman	7,785	0	0
Morter	7,769	0	0
Catley	7,664	0	0
Kilby & Gayford	7,635	0	0
Woodward	7,520	0	0
James	7,520	0	0
W. Shepherd	7,465	0	0
Treasure & Son	7,440	0	0

## WINCHESTER.

For Heating the George Hotel, Winchester. Mr. R. H. GUDGEON, Architect, The Piazza, Winchester. John Grundy, London and Tyldesley.

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## WOODFORD.

For Heating Residence at Woodford. Messrs. SPALDING & AULD, Architects, London. John Grundy, London and Tyldesley.

## YARMOUTH.

For Heating the new Board Schools, Cobholm Island. Messrs. BOTTLE & OLLEY, Architects, Great Yarmouth. John Grundy, London and Tyldesley.

## TRADE NOTES.

THE American log-raft system is not a novelty on this side of the Atlantic. Last month a raft went down the Rhine from Mayence to Holland, which was 725 feet long and 170 feet broad. It carried a crew of 120 hands, housed in some dozen huts along the raft, and the timber was worth 20,000l.

THE Free Library buildings in Capel Street, Dublin, are being extended. The work is being carried out by Mr. James Kernan, contractor, of Talbot Street, Dublin.

NEW sewage outfall works have just been completed for Horwich by Messrs. Walkden, of Liverpool, on a site adjoining the Blackrod Station.

A PAMPHLET setting out the working of the Birmingham Corporation gas undertaking during the last twelve years has been prepared by Mr. Manton, who is a member of the Gas Committee. During that period alterations and extensions, some not yet completed, have been made. In 1875 the total capacity of the gasworks was per day 15,047,000; total capacity of the works in December 1887, 20,500,000; completion of purifying plant at Saltley, equal to retort and storage capacity, will add 1,500,000; and the filling up of the Windsor Street retorts 4,050,000; making a total productive power of 26,050,000.

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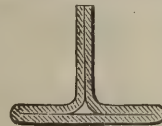
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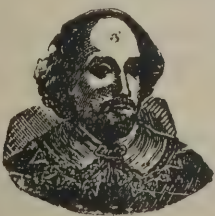


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The estimated capital expenditure required to provide for this increase during the next seven years is 45,000*l.*; a further estimated expenditure of 130,000*l.* will complete the Windsor Street Works, and will bring up the total production per day to 32,500,000. Thus, for an actual net expenditure of 293,409*l.*, and an estimated expenditure for completion of 175,000*l.*, making a total of 468,409*l.*, the department will be enabled to meet the requirements of the next twelve or fifteen years, at less than one-half of the amount which was expected to have been spent to the present date.

At the annual meeting of the Stourbridge School of Art on Friday evening it was stated that there were difficulties in the way of establishing a museum, and that Mr. C. E. Swindell, who had previously given money for the purpose, would allow his donation to be used in other ways for the benefit of the school. The foundation of a scholarship has been suggested.

OFFICIAL intimation was given last Friday by the makers of best iron thin stamping sheets, in South Staffordshire and East Worcestershire, of an advance in prices of 1*l.* per ton. An advance of 20*s.* is also declared on tinned sheets.

THE funicular railway station at Orvieto was opened last week. It ascends the hill for 540 yards, when it meets the high walls of the city, which it runs through by means of a tunnel 130 yards long, emerging at the highest altitude—240 yards above the level of the railway station. By the method adopted for obviating accidents, the ropes are subjected to a maximum strain of one-fifth of their resisting power. Between the metals a broad oak beam runs along the whole length of the line, firmly fixed to the sleepers, and the bottom of the carriage is provided with a steel beam armed with seventy-two spikes. The body of the carriage is held firmly in position by the wire and suitable levers, so that if the rope should break, the gravity of the carriage, which weighs over four tons, would fix the seventy-two spikes instantaneously in the oak beam, and the carriage would stop immediately.

ONE of the clock weights has done damage in Ecclesfield Church by falling from its place in the tower, a distance of about 50 feet, cutting a hole through the belfry, demolishing one of the choir stalls, and injuring two others. The weight is estimated at about a quarter of a ton.

MESSRS. KAYLL & Co., of Ellis Court, Aire Street, Leeds, have completed, for the Idle parish church, a stained-glass window as a memorial of the wife of the Rev. Henry Harrison, vicar. The subject chosen is Dorcas, who is represented dis-

persing her gifts to the poor. The presentation of a rich diaper fabric to a beggar, with widows and children, forms an effective group, having a background in the portals and trees of Tabitha's residence, and a view of the city beyond. The selection of Messrs. Kayll & Co. for the preparation of the window was the result of competition. The work is pictorially rather than conventionally treated. The figures have a roundness of modelling, and the draperies a warmth of tone, which contribute highly pleasing and satisfactory results. Dorcas is represented as a benevolent and matronly creature, but equal, if not greater, care has been bestowed upon the features of the suppliants for her benefactions.

THE stage of the Parc Theatre, Brussels, has recently been lighted by means of the Wenham "Safety" gas lamp, and we understand that the experiment is a complete success. This is an important move in the right direction, as the use of so many naked lights over the stage is, as everyone knows, a source of great danger, and, seeing that the Wenham lamp is entirely enclosed, this risk is overcome. The illuminating power of these lamps is very great, and at the same time the economy, as compared with ordinary burners, is very marked. These lamps have also recently been used at the Promenade Concerts, Covent Garden, with great success.

MR. R. SHACKLETON gave a lecture in Bradford on Monday evening on the waterworks question in relation to the ratepayers and the trade of the borough, and spoke in favour of using the waters at Grimwith until they were exhausted, and of then drawing the waters of the Nidd into Skyrholme and storing them there.

MESSRS. J. & G. THOMSON, at Clydebank, have nearly completed what are affirmed to be the largest shear legs in the world. The legs are of steel plates seven-eighths thick, closely rivetted, and strengthened in various ways. They are of enormous length, and weigh some 112 tons. The new crane will lift over 150 tons.

ON Tuesday Messrs. Bissett & Son, contractors, of Sheffield, handed over to the Birmingham Guardians the new workhouse infirmary, which they have erected under the direction of Mr. W. H. Ward, the architect. Mr. W. C. Bissett said he had given the work his closest attention, with the view to execute the contract in a manner that would meet with general approval. It had been a very great pleasure to him to be connected with the Building Committee, from whom he had received every consideration and assistance. He did not anticipate any

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## STEEL STRONG ROOMS, DOORS, LOCKS, AND SAFES

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### IMPORTANT COMMUNICATION.—WHITELEY'S FIRE.

WILLIAM WHITELEY, Westbourne Grove, London: October 12, 1887.

HOBBS, HART & Co., Limited.

GENTLEMEN,—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting powers of your Strong-room Doors and the Safes.

The recent fire at my establishment, in my opinion, subjected them to the greatest possible test, and through all they proved invulnerable. The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.

You will be pleased to hear that it has been decided to adopt your Patent Clutch Rebated Doors for all the party walls in the new buildings now in course of erection.—I am, Gentlemen, faithfully yours,

(Signed) WILLIAM WHITELEY.



defects being found with his work as contractor, but whatever should arise he would—if it were not for years to come—make good the defects. There were still a few tradesmen engaged in the building in carrying out their respective contracts, but their duties would be soon completed. The contract with his firm was now terminated. The Chairman said the committee felt that Mr. Bissett had used very great exertions of late in pushing on the work, and particularly so as to be able to hand it over to the guardians that morning. He believed the contractors had done the guardians justice, and had carried out their work with great credit to themselves.

THE Leeds Town Council have sanctioned a proposal to purchase for 4,000l. an area of land containing 1,252 square yards in Harper Street, for the extension of Kirkgate Market.

THE report of the joint committees of the Town Councils of Edinburgh and Leith, on a general scheme for the purification of the Water of Leith from Balerno to the sea, includes the construction of a sewer from Balerno to Coltbridge to join the new Water of Leith sewer, which is to start from that point, and the construction of a compensating reservoir to make up for the water abstracted from the river. The cost of these and other suggested works would be 44,000l., which, added to the cost of the sewer from Coltbridge to the sea, would bring up the price of the joint scheme to 130,000l.

ON Thursday evening last week the Northampton master builders had their annual dinner. Mr. W. H. Smith, the president, was supported by Mr. Martin and Mr. Norman, members of the Town Council, and Mr. Gibbins, assistant borough surveyor, Mr. S. J. Newman, architect, and Mr. Ains, secretary. Mr. Martin, in proposing the health of the architects, said builders and architects sometimes disagreed, but as a rule the latter were very useful and a great help to the builder who wished to please his client. Many builders had been much aggravated when the client had tried to do without an architect, and when the work was half done had been dissatisfied with it. The builder then had no third party to rely upon. Other toasts were proposed, and among them success to the Northampton Builders' Association, by Mr. E. Hunter, of London.

A FIRE occurred on Sunday afternoon by which two of the largest warehouses in Buchanan Street, Glasgow, were destroyed, the damage being estimated at 100,000l.

A SPRING of petroleum oil has been found at Anderton, near Northwich, in the salt district, on the property of Messrs. Greenall & Co., brewers.

PLANS for public baths, prepared by Mr. I. M. Jones, city surveyor, estimated to cost 8,500l., were submitted at the monthly meeting of the Chester Town Council, and are to be exhibited to the public for approval in the next few weeks.

A DRINKING FOUNTAIN, presented by Mr. John Aird, M.P., to the Corporation of the City of London for the use of the public frequenting the Queen's Park, Kilburn, has just been formally opened.

A GYMNASIUM and workshop in connection with the Railway Servants' Orphanage at Derby has been opened by Mr. J. M. Cook, of the firm of Thomas Cook & Son, who has erected them for the institution at a cost of 500l.

AT the meeting of the Winsford Local Board on Friday a letter from the Salt Syndicate was read, offering a free supply of brine to the public baths on condition that the Board refused its consent to persons other than the Syndicate to lay brine pipes through the streets. At the same meeting a letter was read from a ratepayer, asking permission to lay pipes to connect a brine shaft with some riverside works.

MESSRS. HUGH KENNEDY & SONS are the successful competitors for the new railway station at Gourock, the brickwork of which is to be eight feet above the quay level. The roof is to be composed of steel girders, supported by cast-iron columns. There will be about 50,000 feet of glass in the roof. The length of the station is to be 320 yards, and the breadth 110 feet. There will be three passenger platforms about 40 feet in width, and the trains will run alongside the steamers, of which the railway company have already arranged for a first-class service. The work, which has already been commenced, will, it is expected, be completed by April 1, 1889, at a cost of about 20,000l. The Messrs. Kennedy have also secured the contract for the Inverkip Street station at Greenock.

A BRASS eagle lectern of singularly chaste design and beautiful workmanship has been presented to the church of St. Michael and All Angels by Admiral Edye. The shaft is massive and elaborate, and forms an enriched brazen pillar surmounted by a highly polished globe, on which the eagle stands. Round the base the following inscription is engraved:—"To the Glory of God.—Presented to the church of St. Michael and All Angels, Helensburgh, by Vice-Admiral William Henry Edye. September 1888." Messrs. Hardman & Co., Birmingham, are the makers.

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Metal Keys.  
BLOCKS IMMOVABLE.

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MESSRS. DOULTON & CO. have taken a lease of two acres of ground adjoining the Seedhill Road, Paisley, on which a branch of their works will be erected.

THOSE of our readers who were interested in the visit of the colonial bishops to England this year will be pleased to learn that a handsome silver pastoral staff is to be presented to the Bishop of Qu'Appelle, Canada. The work has been entrusted to Messrs. Jones & Willis, of Birmingham and London.

### THE ENGINEER OF THE FUTURE.

THE introductory address of a series of lectures was delivered last week in the Engineering Department of the Yorkshire College, Leeds, by Professor Barr. He said:—The labours of engineers have always been recognised as among the most beneficent influences in promoting the civilisation of the world.

Since the birth of time, throughout all ages and nations,  
Has the craft of the smith been held in repute.

It is related of Dr. Arnold that on viewing a train on one of the first railways, he exclaimed, "I rejoice to see it, and to think that feudality is gone for ever: it is so great a blessing to think that any evil is really extinct." And so Carlyle writes, "Of the poet's and prophet's inspired message, and how it makes and unmakes whole worlds, I shall forbear to mention; but cannot the dullest hear steam-engines clanking around him? Has he not seen the Scottish brass-smith's idea (and this but a mechanical one) travelling on fire-wings round the Cape and across two oceans, and, stronger than any other enchanter's familiar, on all hands unweariedly fetching and carrying; at home not only weaving cloth, but rapidly enough overturning the whole old system of society, and for feudalism and preservation of game preparing us, by indirect but sure methods, industrialism and the government of the wisest?" Every one, then, will agree that few questions have a more direct bearing on the future of mankind than that of the progress of engineering practice. But the future of engineering practice must depend on the characters and powers of those who will carry on the labours of the engineers of to-day, and, therefore, we can appreciate the remark of the author of a paper on technical education recently read in America, that the education of engineers "is a matter of momentous interest to the whole civilised world." It is, at all events, a subject which

must not be passed over lightly as one which can take care of itself, nor must prejudice be allowed to govern our views regarding it. I think, therefore, that a brief consideration of the prospects which the future holds out for engineers cannot fail to be of interest to those who will have some share in their fulfilment. I have, therefore, chosen as the subject of my annual address to you "The Engineer of the Future."

My object is not to lay before you any prophecies of what the engineer of the future will *do*, as to show—with, I trust, good and sufficient reasons for the faith that is in me—what the engineer of the future will *be*. That he will have a wide field for his labours, and will have the honour of bringing about social revolutions as great and beneficent as those which resulted from the inventions of Watt and Stephenson, no one can doubt. But in what direction we must look for the next grand departure in his "art of directing the great sources of power in nature for the use and convenience of man"—whether in a great development of the gas-engine, or in the discovery of some cheaper and more direct source of electricity than we now command, or in something more unthought of, I shall not take upon me to predict. Of this, however, we may be certain: great advances will be made, and those will be "in it"—those nations, those firms, those men—whose knowledge will enable them to go beyond the ordinary routine of present-day practice. It becomes, then, a vital question, not only for us as engineers and as individuals, but for us as a nation, to inquire what methods will best insure to us the possession of those qualities of mind and hand which will enable us to strike out new and untrodden paths in invention and production.

There is no subject attracting more attention at the present moment than that of technical education and its bearing upon foreign competition, and there is perhaps none upon which more directly contradictory opinions are expressed by men who ought, at least, to have some knowledge of the subject. I do not propose to enter at length upon a consideration of technical education in its general bearings on the commerce and industry of the country. I would, however, point out in passing that the stock argument of most of those who hold that we have no need of that systematic training in science which other nations have so largely adopted to enable us to keep our position in the industrial struggle for existence, is that our manufacturers and manufactures have still a great hold on the markets of the world. These obtuse individuals remind me forcibly of an old domestic of my grandmother, who, when remonstrated with by her mistress for not wearing warm enough clothing in a severe

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## GRIFFITHS' "PYRODENE" FIREPROOFING LIQUID

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Griffiths' Liquid penetrates the pores of the wood. It lasts as long as the wood itself. It prevents Dry Rot and decay in house timbers. It does not crack, peel, or rub off.

It is perfectly innocuous and free from smell. It will keep any length of time. Any one can apply it. One gallon will cover double that of any other priming.

All Woodwork in new houses should be fireproofed with this liquid, the cost is so trifling in comparison with the preservation of the timber and freedom from risk of fire. If work is desired to be painted afterwards, Griffiths' Pyrodene Paint is best for the purpose.

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### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIRS.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 32 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIRS.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly, S. C. LOWE & SON.

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winter, replied, "When I didna dee last wunter, whatfor wud I dee this wunter?" It is too late to lock the door when the steed is stolen, and it is time that we heard the last of this old wifeism. The question is not how much of our foreign trade (and, for that part, also our home trade) remains to us, but whether our progress has been comparable with that of other nations. Yet the advocates of scientific training are challenged to prove "that the German iron trade is more prosperous than the English iron trade," and "that German iron and steel are better than English iron and steel." That is not the question, whatever its answer may be. We must look at the present position of manufactures in the countries which now compete with us, and compare it with the position thirty, or even twenty, or even ten years ago, and ask ourselves whether we or our rivals have made the most progress. In many industries, while our manufactures have expanded, those of other nations have grown from the seed. A stern chase is a long chase, but our lead in the race is fast being lessened.

Another favourite contention of the class of writers to whom I have referred is that in this country we have not yet been beaten off the field, though we have stuck (with true British doggedness) to our old methods, while other nations have gone in for this new-fangled education craze. I am not aware that the old wooden walls in which we once put our trust were ever wiped off the face of the sea by the navies of any other nation, but he would be a fool indeed who would therefore contend that we should continue to trust for our defence in oak, while other nations have their ironclads, and largely of our building too. So it is in this matter of scientific education. We have in a very large measure provided the science which other nations are now applying to their practice, and shall we alone continue to put no faith in it, while they use it to our destruction? I am convinced that we, as a manufacturing nation, are not sufficiently alive to the great danger which our prosperity in the past may be to us. We do not take the lessons which experience on a more limited scale within our own boundaries would teach us. The fate of Norwich—as referred to by Mr. Swire Smith, for instance—"Norwich, which one hundred years ago was the centre of the wool industry, and the most important manufacturing city in the country, refused to adapt itself to the new conditions. . . . It fought against the progressive spirit of the age, as men fight against it now, and it is recorded that in the beginning of the century, 'for anyone to set up machinery in Norwich was to venture his life.' The golden opportunity passed by, possibly never to return, and the

great worsted industry deserted its ancient stronghold, and took root among the enterprising people of the West Riding of Yorkshire."

Nor do we take the lessons of the history of nations. Frederick the Great introduced certain novelties of drill and manœuvre in the training of his armies, and through their influence he won most of his battles. But Napoleon introduced newer methods, while his rivals stuck to those which had secured them their greatness, with results that need not be detailed. The Germans took the hard lesson, and it bore its fruits in the war of 1870. These ups and downs of nations should suggest to us the question in relation to industry, Are we who have the field—and unbounded self-confidence as a nation besides—or are they who have to fight their way up to our position, and are determined to do it—are we or are they most likely to investigate and discuss with earnestness and success the best implements of warfare and methods of attack? Surely they are. It was ever so. Hence you may be certain that what other nations do so deliberately, and with so much thought and discussion, is what will, in all probability, be the best and strongest course. And, therefore, when we find other nations who are doing all in their power to rival us—America for example—adopting the most carefully drawn-up and complete schemes of scientific and technical instruction, we may feel sure that the matter has been well considered, and that, too, from a point of view much more likely to be unprejudiced than that of those in this country who rest upon our past success and greatness.

(To be continued.)

#### BRUSSELS EXHIBITION.

FROM the list of awards to British exhibitors, as far as they have at present been made known, the following are taken:—

*Gold Medals.*—Barstow, Jacob & Sons, Pontefract—filters; Brooke, Edward & Sons, Huddersfield—enamelled bricks; Chubb & Son's Lock and Safe Company (Limited), London—locks, &c.; Chubb & Son's Lock and Safe Company (Limited), London—panic doors; Doty Lighting and Heating Corporation (Limited), London—petroleum lamps; Fourness Regenerative Lamp Company, London—gas lamps; Great Eastern Railway Company, London—steamship models; Harrington, John, Coventry—patent tubular bells; Pen-yr-Orsedd Slate Quarry Company (Limited), Nantlle—slates; Rottmann, Strome & Co., London—embossed papers; Ruston, Proctor

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*Diplomas of Honour.*—Chubb & Son's Lock and Safe Company (Limited), London—locks, safes, &c.; Jennings, George, London—lavatory appliances; Merryweather & Sons, London—fire engines; Lee Bapty, S., London—decoration and installation of British Empire section.

#### SAFETY FROM FIRE.

MR. JOHN AIRD writes from Brussels:—I have been making inquiries in Amsterdam, Vienna, and Berlin as to the methods adopted by the fire brigade for saving life from fire, and earnestly hope when Parliament reassembles that a committee or a commission will be appointed to investigate and report upon this important matter. At Amsterdam and Vienna life-saving appliances form part of the equipment to accompany the first engine, this comprising ladders, ropes, slings, canvas, &c., and in both cities the telegraphic arrangements are most complete. It but seldom happens there is any loss of life from fire. At Berlin the arrangements are very perfect. The police control the construction of buildings to insure escape. Notices are freely placed to make known the position of the police offices and fire-brigade stations. Children at school are educated as to the course they should adopt in case of fire, and all gas supplies can be cut off in a minute. The Metropolitan Board pass a resolution admitting the inefficiency of the present arrangements, and do nothing; the responsibility must therefore rest with the Government.

#### TENDERS FOR THE BIRMINGHAM LAW COURTS WINDOWS.

A LETTER has been addressed by Mr. Wm. E. Loder, of Birmingham, to the local *Daily Post* last Friday, in which he says:—Your issue of to-day contains two letters published by way of challenge to the decision of the Jubilee Committee respecting the stained-glass windows for our new Law Courts. In common justice to the successful firm in the competition, I ask you to give publicity to this protest. Your correspondent "F." takes exception to the expression that the tender for 1,700*l.* "being the lowest, was accepted." This demands but

slight notice, as the respectability of each competing firm was undoubtedly ascertained before its members were invited to submit designs, and this respectability being based on their many well-known productions, their reputation depends on their manufacture of really first-class windows. Again, "F." does not know, "even by name, the firm;" then, in the name of all that is genuine, I trust he will never commit himself again by advising on the matter of stained glass. Not to have heard of the firm who recently executed beautiful windows for the English church at Copenhagen—the firm which numbers among its patrons such influential clients, such devotees of the art, as the Duke of Westminster, Lord Egerton of Tatton, Lord Wolverton, the late Marquis of Ailesbury, and the leading architects of the day, is tantamount to possessing an infinitesimal knowledge of the trade and its chief exponents. The selected firm employs the most talented artists, and having in my professional career had many opportunities of visiting their show-rooms in London, I am convinced that lovers of the art in Birmingham may confidently rely on the new Law Courts possessing at the completion of the work some of the finest stained glass in the country. Such letters as those to which I am referring are calculated to prejudice the public mind; and my excuse for writing is that I may in some measure assure "F." and others harbouring similar dissatisfaction, that the firm to whom the stained glass is entrusted never sacrifice art to prejudice and censure.

#### FALL OF A HOUSE IN DUBLIN.

THE inquest held in Dublin by Dr. Whyte, the city coroner, owing to the death of a child, Esther Murphy, killed in the fall of a house in North Cumberland Street, was concluded on Friday.

Sergeant Halligan deposed that it was the duty of the sub-sanitary officers to report to the city engineer any unsafe tenements in their districts. They only inspected houses held in tenements, except when their attention was specially called to other dwellings. He found that the house 38 North Cumberland Street had been reported to the late city engineer (Mr. Neville) by sub-sanitary officer Michael Hackett on April 20, 1886. The inspection of houses was not a duty under the Sanitary Act, but lay in control of the Public Health Committee of the Corporation.

Thomas Williams, who occupied the back parlour of the house, deposed that ten or twelve weeks ago a portion of the

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side wall of his room fell, exposing the rafters, and leaving no support for the end of the joists. He immediately reported the matter to the landlady, Mrs. Hearne, who, with her husband, occupied the shop on the same floor as witness. He told her there was no use plastering it, as the foundation of the back wall was completely gone. He subsequently prevented a man from plastering it, and nothing further was done to repair it. Three falls had occurred in the house previously—one of them over his head and another in the front drawing-room.

Mr. Harty, city engineer, deposed that there were two Corporation building surveyors, one for the north and the other for the south side of the city, connected with his department. Their duty was to look after new erections, and the duty of inspecting old houses lay with the eighteen sanitary officers, and the police also sent in reports, as did private individuals, and every case was inquired into. Witness had searched the records for the past eight years, and had found no report concerning this house except that made by sub-sanitary officer Hackett in 1886. The witness read the report, which was as follows:—"I also beg to draw your attention to the house 38 North Cumberland Street, the plank wall of which is cracked, and has been newly plastered; owner, Thomas Hearne." Mr. Neville had himself inspected the house, and found there was a crack in the wall of the next lane, but that there was no danger from it. As a matter of fact, that portion of the house was still standing.

Can you explain why the back of the house was not examined at that time?—I know that Mr. Neville examined every room in the house, and I believe that the other portion of the house was safe at the time. On inspecting the house, I found that it was a chimney-breast that had given way, and brought the floors with it. It was simply a chimney-stack built up against the walls of the other houses, and not tied to it at all. That was wrong, but it might still have been perfectly safe when Mr. Neville inspected it. House jobbers did their best to conceal cracks and other defects in their houses by covering them up with plaster, or papering them over.

Coroner: When the rafters become rotten, and they are covered up, is there any means to discover that condition of things?

Witness: There is not; but we try them by shaking the floors. The great danger is that these houses are converted from private dwellings into shops. The chimney-breast is cut away, and a beam put in upon which the whole private dwelling rests.

The Coroner: Can you prevent a man from doing that? Witness: Not as long as there is no danger. They could not interfere before an accident occurred. He thought that state of things should be remedied.

The Coroner said that was a matter for legislation.

Michael Hackett, sub-sanitary officer, deposed that he visited this house in April 1886, and reported on it. He afterwards heard that it was not in a dangerous condition. He had never been refused admission to any house.

Charles Verschoyle, Superintendent Barrack Street Cottages, deposed that he called the last witness's attention to the house in 1886. Every report he made was attended to.

A Juror: I think it is clear that the engineering department did not do their duty.

Mr. Harty protested against the engineering department being blamed when they did not deserve it.

Witness, in reply to Mr. Harty, said there was a house in Mecklenburgh Lane still standing which he had reported as dangerous.

If a professional man reported the house as not being dangerous, would you adhere to your opinion?—Certainly not. Every one of his reports was punctually attended to.

Sub-sanitary officer Kelly said he was the officer of the district at present. In April last he reported this house as being in an unsanitary condition, but not as being unsafe. He noticed nothing dangerous about it. His duty had not allowed him to inspect it since.

The Coroner said it was a very serious thing that a next-door neighbour might be endangering a house and no one interfere, unless it was absolutely dangerous at the time.

Mr. Thomas Parker, carpenter, said that it was a strange thing that men who knew nothing at all on the subject should be inspectors of houses.

The jury returned a verdict that the occurrence was accidental, and that they were of opinion that a closer watch should be kept over houses of the kind by the Corporation officials.

#### PUBLIC WORKS IN CYPRUS.

AN account of works carried out in the island of Cyprus since its occupation by the British has lately been given by Mr. S. Brown, the Government engineer. Comparing the present state of Cyprus as regards means of communication



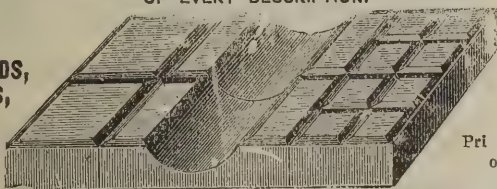
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with its condition at the time of the British occupation exactly ten years ago, he says there then existed what was called a road between the principal port of Larnaca and the capital, Nicosia (26 miles), but as it was unmetalled it was impracticable in wet weather; it was scored with deep ruts, and those who have made the journey in the solitary vehicle that occasionally ventured between the two towns will not readily forget the shaking they had to endure. A cart-track had also been partially marked out from Nicosia to Kyrenia on the northern coast (16 miles), but I have not heard that any vehicle had ever succeeded prior to the occupation in accomplishing the journey. Besides these there was in 1878 no other vestige of a made road throughout the island. At present about 400 miles of main roads have been laid out, and of these the earthworks and drainage of three-fourths of that length have been completed, and upwards of 200 miles have been metalled or gravelled, so as to be serviceable for wheeled traffic in all weathers. It is true that much remains to be done by forming the connecting links to complete the main lines of communication. The works are, however, so far advanced that were funds available the main roads (by which I mean those that connect the capital with the chief towns of the various districts and these with each other) might be completed in little more than a year and for a comparatively small sum. The advantages of the improvement in the communications already effected are manifest to all acquainted with the island. Instead of an occasional omnibus there are now four or five daily in each direction between Nicosia and Larnaca, besides numerous private carriages, and the cost of the transport of merchandise has been reduced one-half. A system of cart roads has been carried through the mountains of the Limassol district, reaching a summit level close on 3,000 feet above the sea, for connecting the principal wine-growing villages with the port of shipment.

As regards bridges, besides hundred of smaller bridges and culverts, some of the principal torrents have been spanned by works of considerable magnitude. Of these I may perhaps be allowed to mention an iron girder bridge over the Pedias of three spans, each of 40 feet, and compound iron and timber bridges over the Idalia, the Vasilikos, and the Limnati torrents of from 120 feet to 210 feet of waterway. Besides new bridges, many of the ancient bridges which we found in a ruinous condition have been restored and rendered serviceable.

Shortly after my appointment as Government engineer in 1880 my attention was called to the Pedias Canal, which

supplies water to the best part of the rich plain of the Messaoria, and is the most extensive irrigation system in Cyprus. The ancient channels had been allowed to silt up, and the banks were so breached that the canals were altogether unserviceable. They have since been cleared out, the derivation weir reconstructed, and the breaches in the banks repaired; and during the past seven years the works have been maintained in an efficient state, and thereby the value of the crops from the area watered by the canal has been augmented by an annual sum of at least 10,000*l.* Last year a law was passed empowering the Government to advance money and carry out irrigation works, and various schemes are now under consideration. That more has not yet been done may be due to the fact that it takes some time for the peasant proprietors to consult together and agree as to the works it may be deemed desirable to carry out.

It is perfectly true that a safe deepwater harbour is one of the great wants of Cyprus, but as a work of this nature is naturally one of some magnitude, it would appear that no Government has yet thought fit to apply to Parliament for the necessary funds. From its geographical position on the northern side of the island, it would be a fatal mistake to construct a first-class harbour at Kyrenia, that port being out of the line of direct communication with Europe and Egypt, while on the other hand, as it lies exactly opposite the coast of Asia Minor, from which it is separated by less than fifty miles of sea it is admirably situated for carrying on, and has always maintained, a trade with the mainland, and it was to afford shelter to the coasting craft engaged in this trade that the breakwaters were designed and are being constructed by convict labour for the comparatively small sum of 8,000*l.* That the works, although now unfinished, will answer the purpose for which they were designed is proved by the fact that last year the trade with Asia Minor was (for the first time since Kyrenia became a port centuries ago) carried on throughout the winter, instead of the local craft being hauled up on the beach, as they invariably were in previous years every autumn as soon as the weather broke. Besides Kyrenia Harbour, the following maritime works have been executed since my appointment, eight years ago:—An iron pier at Limassol, 600 feet long, carried out into 20 feet of water, provided with cranes and placed in communication with the Customs warehouses by means of a tramway; an iron pier at Larnaca, 450 feet in length. In addition to these piers four iron jetties for lighters have been constructed—at Larnaca, at Limassol, at the Carub shipping station on the

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coast at Ziyi, and in the ancient harbour of Papho. Harbour lights have been provided at Kyrenia, Famagusta, and Limassol, and an important coast light is in process of erection at Cape Papho, the south-western extremity of the island and the point first made by vessels approaching it from the westward.

### COURT THEATRE, VIENNA.

THIS theatre was opened on the 14th. The *Times* says:—The sight of the auditorium, lit by electricity with 4,000 16-candle power lamps, was beautiful in the extreme. The decorations of the house are white and gold, the coverings of chairs, boxes, and stalls of ruby plush. The gorgeousness of the foyers and lobbies, and especially of the retiring-rooms attached to the Court boxes, almost passes description. In fact, the eye turns with relief from all the gold, polished marbles and scarlet draperies to the admirably executed mural and ceiling pictures to be found in every part of the house. It has taken thirteen years to build the theatre, and Baron Hasenauer, the architect, has produced a work beyond comparison finer than any theatre ever constructed or dreamt of. He has especially kept in view the safety of audiences, so that the space occupied by staircases, corridors, and lobbies is quite double that allotted to the auditorium and stage. Two vast staircases of palatial magnificence, ascending without any turn to the level of the first floor, give access to the boxes right and left of the house. These staircases fill up two wings, extending from the rotunda which forms the centre of the building. There are also separate entrances for pit-stalls and galleries. Ante-rooms are attached to every box. These open on to semicircular corridors, and from these access is obtained to the semicircular foyers. The doors are so many and so wide that no panic could produce a crush. Upon every floor the audience, rushing out, would disperse itself easily through the vast foyers, and find its way to the doors of exit.

### PEOPLE'S PALACE CLASS OF MASONRY.

At the People's Palace, Mile End Road, a class for the study of the science of masonry has been organised. It is conducted by Mr. Lawrence Harvey, F.R.I.B.A., with the assistance of four of the leading master masons of London. The class met

for the first time on Saturday, the 13th inst., at six o'clock, and was numerously attended, the number of applicants being much greater than the class-room can possibly accommodate.

Mr. Harvey opened the proceedings by stating that a few days ago he was expressing to Sir Philip Magnus his regret that the petition signed by nearly 400 masons for the establishment of such a class at the City and Guilds of London Institute could not be granted, when Sir Philip remarked that petitions had very little value; nothing was so easy as to get signatures, but would the signers come? That was the question. Now, here, at the People's Palace, were more than thirty men who had most of them travelled over two hours to attend this class. They had come from Putney, Peckham, Lambeth, Wandsworth, Kennington Lane, Vauxhall; and it was reasonable to ask, would they not have come in still larger numbers to the Guilds Institute, which was much nearer their homes? This was their practical answer to Sir Philip Magnus's question. Another idea which found much favour outside the working classes was that "workmen only require a smattering of knowledge." This idea was entirely false. The workmen who had advised the men who were present to join this class did so after following the course of lessons given to architects by Mr. Harvey—a course in which, as stated by a great mathematician, Professor Henrici, very high questions of geometry were treated. What is needed is not second-rate science, trimmed down to suit workmen, but the very science professional men boast of possessing. Workmen want to know all there is knowable, and not an atom less. Mr. Harvey then described the part master masons took in the erection of our old cathedrals, and quoted several recent instances of masons who had risen to eminence as architects. Amongst the advantages enjoyed by architects risen from the ranks of masons was their intimate acquaintance with workmen, which enabled them to select thoroughly trustworthy clerks of works.

After this introductory discourse Mr. Harvey called on Mr. Wornell, foreman of masons in the works of Mr. Nightingale, Lambeth, to deliver a lecture on English quarries and the preliminary work previous to quarrying. In the course of his lecture Mr. Wornell exhibited a collection of specimens of the stones used in London, and explained their properties, advantages, and defects. Mr. Wornell's lecture was followed with the greatest interest, and in every way this first meeting of the People's Palace class of masonry can be considered a great success, and amply proves how much classes of this kind are required all over London.

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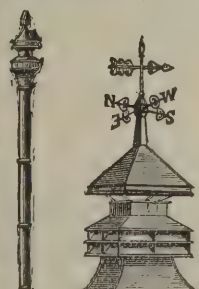
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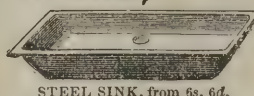
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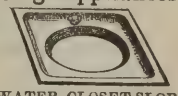
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## REGISTRATION OF PLUMBERS.

THE West of Scotland Technical College authorities and the District Council, acting in conjunction with the Plumbers' Company, have started technical classes for plumbers. The introductory lecture was delivered on Thursday night in the large hall of the Christian Institute, Glasgow. There was a very large attendance, upwards of eight hundred plumbers—masters, operatives, and apprentices—from all parts of the district being present. Mr. Thos. Russell, one of the governors of the Institute, presided, and, in introducing the lecturer, urged the students to remember the responsibility for human life which rested with plumbers. The lecturer was Mr. J. W. Clarke, the first practical plumber who succeeded in obtaining the company's freedom by passing in honours the prescribed examination in the principles and practice of the craft. Professor Jamieson and several of the governing body of the Institute were present, and it was mentioned that upwards of seven hundred plumbers had already been registered in the district.

The following is a list of plumbers registered since September 1, 1888:—

*London Master.*

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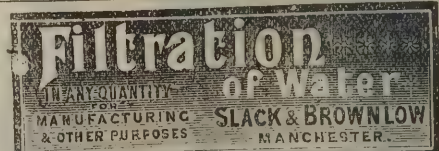
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## PATENTS.

[This List of Patents is compiled specially for this Journal by  
Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting  
Patent Agents, 43 Southampton Buildings, Chancery  
Lane, London, W.C., from whom all particulars and in-  
formation relating to Patents may be had gratuitously.]

## APPLICATIONS FOR PATENTS.

14321. William Henry Kent, for "An improved pocket  
compass." October 5, 1888.  
14327. Alexander Hutchison, for "Improvements in the  
construction of baths." October 5, 1888.  
14334. Carl Prockl and Franz Fortelka, for "Contrivance  
for measuring distances, system Fortelka-Prockl, 1887." Oc-  
tober 5, 1888.  
14340. James Cosmo Newbery and Claude Theodore James  
Vantin, for "Improvements in the process for the treatment of  
sewage." October 5, 1888.  
14341. James Cosmo Newbery and Claude Theodore James  
Vantin, for "An improved process for the separation of fine  
clayey matter from a liquid in which it is suspended." Octo-  
ber 5, 1888.  
14354. Henry Smith Edwards, James Harry Edwards, and  
George Straket Falck Edwards, for "Improved process of manu-  
facturing cowls and apparatus therefor." (Complete specifica-  
tion.) October 5, 1888.  
14364. Francis Murray Rogers, for "An improved silent  
fastener for doors, windows, and like purposes." (Stewart  
Reid, New Zealand.) October 6, 1888.  
14377. Joseph Kaye, for "Improvements in means for  
operating fastenings for exit and other doors." October 6,  
1888.  
14382. Thomas Dalton, for "Improvements in apparatus  
for opening, closing, and securing skylights, fanlights, case-  
ment and sash windows, and louvres." October 6, 1888.  
14422. John William Bernhard Wright, of the firm of  
Wright & Butler, for "Improvements in the construction of  
stoves and tile hearths for stoves." October 8, 1888.

14423. Henry Metcalf, for "An improved ventilator." Oc-  
tober 8, 1888.  
14439. Frederick Simpkin, for "A safety sash window-  
frame." October 8, 1888.  
14450. James John Pearson and Tom Henry Taylor, for  
"An improved double-acting pump for the pumping or  
circulating of fluids." October 9, 1888.  
14454. Benjamin Talbot, jun., for "Improved rain-troughs  
for the roofs of buildings." October 9, 1888.  
14483. George Harper, for "Locks and keys." October 9,  
1888.  
14491. William Sayer, for "Improvements in apparatus for  
making bricks, tiles, and similar articles from plastic clay and  
the like." October 9, 1888.  
14496. Robert Mansell, for "Improvements in *portière* or  
door curtain rods, and in fixing the same in position." Oc-  
tober 9, 1888.  
14530. Eldred Wilson Head, for "Improvements in moulds  
for moulding and dressing bricks, blocks, and slabs, applicable  
also for expelling moisture from clay, whiting, prepared fuel,  
peat, and the like." October 10, 1888.  
14539. Thomas Stephenson, for "Certain improvements in  
earthenware tiles." October 10, 1888.  
14542. Reginald Wilmot Hayes Newington, for "Improve-  
ments in electric and other bells." October 10, 1888.  
14547. William Parry, jun., and Richard Griffith, for "A  
new automatic keyless lock." October 10, 1888.  
14575. Henry Harrington Leigh, for "Improvements in  
coke ovens." (Theodor von Bauer, Germany.) October 10,  
1888.  
14587. Isaac Kirkbride, for "Improvements in window-  
sashes." (Complete specification.) October 11, 1888.  
14596. Robert Thompson McHeenan and Samuel Hudson  
Pellar, for "Crown spring hinge, for automatically raising the  
seats of water-closets when not in use." October 11, 1888.  
PROVISIONAL SPECIFICATIONS ACCEPTED.  
9403. William Thomas Symons and Lewis Prust Symons,  
for "Improvements in material for floors and floor and wall  
coverings, and applicable for other purposes." June 28, 1888.  
10219. Robert Williams Gamble, for "A new or improved  
combined door spring-alarum." July 13, 1888.  
13155. William Joynson, for "Improvements in, and con-  
nected with, roof gutters." September 12, 1888.  
13326. John Hawthorn, for "Sinking metal cylinders,  
lining or tubing for heading shafts or wells employed in

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Directory for England, Scotland, and Wales."

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to receive particulars or catalogues of goods, with the leading specialties marked. Names of approved specialties are inserted **WITHOUT  
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making foundations, or in mining, tunnelling, or well-sinking." September 15, 1888.

13579. Abraham Stokes, for "Improved guiding apparatus for gas-holders." September 20, 1888.

13761. Alexander Bobrownicke, for "Improvements in the treatment of town refuse and other putrescible matters." September 24, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

15141. John Cardwell and James Chander, for "Improvements in bolts for securing shop-window shutter-bars, sliding-sashes, and for other analogous purposes." November 7, 1887.

15476. Ezra Lofts, for "Improvements in or relating to ventilating." November 12, 1887.

16877. Hiram Stevens Maxim, for "Intermittent water discharge, applicable to the washing-out of drains, water-closets, and to similar purposes." December 8, 1887.

16924. Benjamin Joseph Barnard Hills, for "Improved extinguishing apparatus for circular or Argand oil-lamps." (Anton Weiseman, Germany). December 18, 1887.

185. Alfred Clifford, for "Improved waterspray apparatus for extinguishing fires." January 5, 1888.

2199. Francis Joseph James Gibbons, for "Improvements in hanging centre-plates for fanlights, applicable also to other analogous purposes." February 14, 1888.

2886. Francis Joseph James Gibbons, for "An improvement in sash pulleys for windows; applicable also to pulleys for other purposes." February 27, 1888.

10913. George Davies, for "Improvements in drain-traps." July 28, 1888.

12589. Henry William Joseph White, for "Improvements in window and other fasteners, specially applicable to sashes, casements, doors, and for other similar purposes." September 1, 1888.

12771. Richard Cardwell Robinson, for "An improved construction of die for use in brickmaking machines." September 4, 1888.

PATENTS SEALED, OCTOBER 12, 1888.

11966. James Bazeley Petter, for "Improvements in stoves and fireplaces." September 3, 1887.

12467. Alfred Winrow and Herbert Roe Tandy, for "Improvements in brickmaking machines." September 14, 1887.

13127. Aaron Stephenson, for "An improved butt hinge and method of fixing same to doors." September 28, 1887.

13258. William Harry Dutton, for "Revolving doorpost or other revolving posts for public buildings or others." September 30, 1887.

16276. William Wemyss Kennedy, for "Improvements in or connected with gas lamps or burners, including the carrying of shades and appliances relating thereto." November 26, 1887.

9556. Albert Elmendorf, Stephen Ayrautt Gardner and Charles Prentis, for "Improvements in water-closets." July 3, 1888.

#### ABRIDGMENTS.

"Improvements in means of, and apparatus for, fastening and securing blocks of wood and analogous materials in position when used for flooring and other purposes. No. 14716. 1887. A. J. Hopkins, 27 Mortimer Street, London.

*Claim I.*—The method of securing blocks of wood and analogous substances by means of metal pieces or nails, each nail having a double shoulder or encircling-rest for the punch, as set forth, the front ends of the said nails being inserted into the one set of blocks by means of a driver, such as shown, and then have other blocks forced on to them, all substantially as and for the purposes set forth.

"An improvement in glazing." No. 372. 1888. Wm. Gibbs, 397 Kingsland Road, London.

*Claim I.*—The drawing of brass, copper, or other hard metal either from cast bars, sheet, tube, or the like to the required sections of ordinary "lead-glazing," substantially herein described, and according to the accompanying drawings.

"Man-hole cover for sewers and drains." No. 11762. 1888. Elliot Emanuel, 53, 55, and 57 Marylebone Road, London.

*Claim I.*—The form of recess of india-rubber which cannot be pulled out when the cover is taken off, substantially as described in the specification.

*Claim II.*—The groove in the india-rubber which secures an air-tight joint, substantially as described in the specification.

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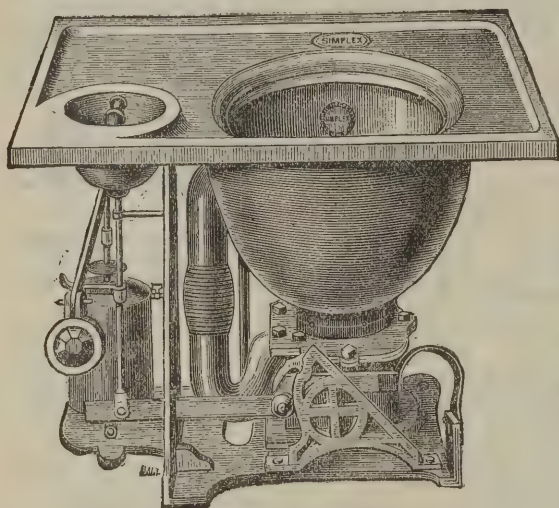
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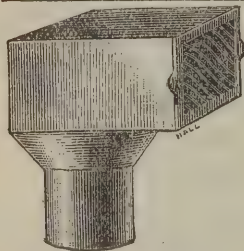
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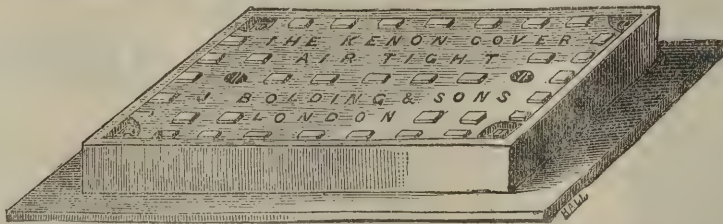


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# The Architect.

## THE WEEK.

MR. WATERHOUSE will deliver his presidential address on Monday evening, November 5, when a large number of members will be sure to attend. Although a zealous member of the Institute and the Manchester Society, Mr. WATERHOUSE has been chary about writing papers or speaking. Among the topics with which it would be well to deal two are mentioned in the last number of the *Journal of Proceedings* of the Institute. One is the Benevolent Society, which is not aided in proportion to the increase of members of the Institute. It is said that "Although the applications for relief have been more numerous, yet, during the last three years, the income obtained by subscriptions has not increased to any appreciable extent; while a comparison of the subscriptions received in 1883 (344*l.* 19*s.*) and those in 1887 (334*l.* 12*s.*) shows a decided falling off. The number of members of the Institute has considerably increased of late years, and it is hoped that more will subscribe to the Architects' Benevolent Society than has been the case hitherto." An appeal from Mr. WATERHOUSE would do much to help the Society. The condition of the library also indicates the indifference of the members. It appears that the "desiderata" have been supplied during the last nineteen years at the rate of a trifle over one per cent. per annum. Foreigners appear to be more liberal in proportion to their number than the English members. It is related that during the last three years, of 269 donations by members, 186 were made by British and 83 by foreign members, and 173 donations were made by non-members, 131 being by British subjects and 42 by foreigners. At one time it was supposed that a visit to the library was waste of labour, but the convenience of readers is more studied now, and if the library is allowed to exist it ought to show some approach to completeness.

A PAPER on the Temple of Apollo at Delphi, by Professor MIDDLETON, was read in part at a meeting of the Hellenic Society on Monday. The temple, of which remains exist, was the fifth on the site, and was built by means of a subscription raised throughout Greece under the authority of the Amphictyonic Council. The Alcmaeonidae of Athens were the contractors. The architect was SPINTHARUS, a Corinthian. Professor MIDDLETON showed that the temple was hexastyle and peripteral in the Doric order, with the probable dimensions of 192 feet by 72 feet 6 inches on the top step. It was built of limestone, coated with the finest stucco. Comparing the style of the details with those of other Doric temples, Professor MIDDLETON conjectured that it must have been later than the temple of Corinth, and possibly also than that at Aegina. After reference to his conjectural restoration both of the temple and of the subterranean oracular cell, the writer spoke of the wall enclosing the *temenos* as of the finest Greek masonry, and remarkable not only for its construction but for the fact of its face being covered with closely-cut inscriptions, dating from the end of the third century B.C. to the time of HADRIAN. In the course of the discussion which followed it was pointed out by Mr. F. C. PENROSE, as the result of recent explorations on the Acropolis, that the older Parthenon was built not of marble but of limestone covered with fine stucco, and also that Ionic capitals came into use in Greece earlier than had previously been supposed. Mr. FARNELL recommended excavations on the site of the temple, as it might be ascertained whether the *Apollo Belvedere* and the *Stroganoff Apollo* did not commemorate a repulse of the Gauls from Delphi by the agency of the god.

A CORRESPONDENT complains that in a paragraph last week the name of ALEXANDER THOMSON was not associated with the reference to the "travelling studentship" of the Glasgow Society of Architects. The omission is to be ascribed to the official report. No slight was offered to the shade of the architect in London or Glasgow. The Society

possesses only one travelling studentship, and architects know that it was founded as a memorial of ALEXANDER THOMSON. Our own experience is that men who do nothing to promote THOMSON's fame, and, in fact, deride his style, profess to be the most touchy about the quality of his work when it is noticed by strangers.

THE Germans, after exploring Olympia, and drawing from it the fine examples of sculpture, do not appear to have taken much pains to preserve the remains of the temple. Mr. HAROLD PARSONS says that, during a visit in last spring, he spent most of his time in destroying the young pine trees, often 5 feet high and more, whose roots had penetrated the calcareous stones in all directions. The ravages of the asphodel were also serious, and the weeds with which the gigantic drums of the pillars were covered, when uprooted invariably bring away a mass of disintegrated rubble and shells. The ground-plan of the temple precinct can be made out, but unless care is taken the limestone will be overturned by the vegetation. Mr. PARSONS proposes that the Society for the Promotion of Hellenic Studies should invite subscriptions towards the provision of a caretaker for the ruins themselves, such as those provided by the Hellenic Government for Delphi and Eleusis.

THE new Shaftesbury Theatre, of which Mr. PHIPPS is architect, has a depth of 58 feet 4 inches from curtain to back of pit, and from curtain to back of stage the depth is 45 feet. The stage is 30 feet in width and 27 feet in height. The theatre can accommodate 1,800 persons. The hangings are of plush, a rich brown colour, lined with salmon-coloured silk. The colours of the decorations are light French grey and gold, and the walls of the theatre are covered with a dark terra-cotta paper. The stage is separated from the auditory by Mr. MAX CLARKE'S Patent Protected Iron Curtain, manufactured by Messrs. CLARKE, BUNNETT & Co., covered on the audience side with green baize, and worked by hydraulic power supplied from the mains of the Hydraulic Power Company, which run up in the subway underneath Shaftesbury Avenue. The auditory is at present lighted by one of Messrs. STRODES'S sunlights, but it is proposed very shortly to instal the electric light all over the building. The ironwork was supplied by Messrs. MORLAND & SON, and the general contractors were Messrs. PATMAN & FOTHERINGHAM. The theatre is isolated on all sides, and egress for the auditory is afforded by thirteen doors.

THE remarks of Consul-General DUNDAS, in his last report on the trade of Hamburg, deserve attention in this country. He says that, "Notwithstanding British manufacturers and merchants may pooh-pooh the possibility of their being cut out by German trade, it is nevertheless slowly but surely making its way, and attaining proportions the more alarming from its silent and undemonstrative progress. Germany's efforts have been directed to one end with a steady persistency—and that not unsuccessfully—to emancipate her trade from foreign hands, and to get it within her own control." As proof of what is being done, the Consul explains that the trade of Great Britain and the Australian Colonies with Hamburg amounts to 21,000,000*l.* a year. He suggests that English producers should endeavour to foster the notion of the superiority of English goods; but, unfortunately, the Germans are able in many cases to controvert an assumption of that kind.

THE Brown-book of the Association is now a fairly-sized volume, since it contains 177 volumes, or ten more than last year. No other directory of an architectural society can show so many signs of activity as are to be seen in the elementary and advanced classes, lectures, and other aids to knowledge. The number of members has increased from 993 to 1,052, the majority, as usual, coming from London. Everything that is practicable is done to give help to members in the provinces, and there should be more than 224 of them on the rolls. Among the additions is the prospectus of the Cycling Club, which is likely to grow into a useful institution. The session begins well, and under Mr. APPLETON'S presidency we may expect further developments.



## KIRBY HALL AND WELDON STONE.

KIRBY HALL in Northamptonshire was at one time among the stately homes of England, but it is now in a condition that must excite indignation as well as regret. Within the memory of men who are still living that house was habitable, but some years back the then possessor appears to have resolved that his heirs must seek a home elsewhere. His lordship began with selling the lead that covered the roofs to a pedlar for a small sum, and the money, it is said, was never paid. The noble lord was, we imagine, no less generous in disposing of other materials, and if Kirby Hall was not used as a source of supply for wood and stone, then appearances are deceptive.

The history of the building is not clear. According to one account it was erected for Sir HUMFRED STAFFORD. The boar's head crest, the initials H. S., and inscriptions in stone would support that view. Afterwards the house is supposed to have passed to Sir CHRISTOPHER HATTON in exchange for Holdenby. It is maintained, also, that Kirby Hall was always the property of HATTON, as it was erected at his expense, and the fine outer gateway certainly bears his arms. JOHN THORPE records that he laid the foundation-stone of Kirby Hall in 1570. In the following century INIGO JONES was commissioned to make some alterations.

The exterior shows two modes of treatment. As seen from the park on the west side, the Hall bears a resemblance to many Elizabethan buildings, and the most remarkable feature will be found in the great bow windows. But more of the Italian spirit will be seen in the court and in the parts near the porch. THORPE believed in the advantage of pilasters, which he employs with much skill. This will be suggested by the sketch of the Hall which appeared in this journal a fortnight ago.

HATTON is said to have won the favour of ELIZABETH through his dancing in a masked ball given in her honour by the Inns of Court. He was appointed gentleman of the Privy Chamber, and was in the constant receipt of valuable presents from the Queen. It was ELIZABETH'S custom to give her courtiers from forty to fifty ounces of plate on each New Year's day, but on those occasions HATTON obtained four hundred ounces. In 1572 he became captain of the guard, and the next year, when ill, he was sent to Spa with the Queen's physician as one of his attendants. Subsequently he was made vice-chamberlain and a privy councillor. In 1582 he retired from court through jealousy of RALEIGH. He was brought back and rewarded with the chancellorship. Although he was unskilled as a lawyer, his good sense brought him commendation—"Splendissime omnium, quos vidimus, gessit," says CAMDEN. ELIZABETH honoured HATTON with a visit in 1589. The expense of the preparations bore heavily on the chancellor, but it was not his only grief. Money was needed at the time for the public defence. The Queen, while at Kirby Hall, claimed an immense sum from HATTON for first fruits. He was unable to pay, and soon afterwards he died. Holdenby was sold to raise the money.

Kirby Hall was therefore built out of moneys which came from ELIZABETH. No country knight at the time could otherwise undertake a work having so much grandeur as was seen there. It was not only costly to build, but needed an enormous outlay to keep up, and, with all his income, it was as much as Sir CHRISTOPHER HATTON could sustain. Some allowance should accordingly be made for his inheritors when they wished to be clear of the building.

In these latter days, when landed property in England can barely pay the charges upon it, how many proprietors would have the courage to dream of the restoration of a building which has by degrees fallen into the condition of Kirby Hall? Lord WINCHILSEA has, however, resolved to make the attempt, and hopes to find the money which is necessary by selling the stone which is to be found on part of his estate at Weldon, where, at one time, quarries were opened.

On Friday last a great many architects and builders accepted Lord WINCHILSEA'S invitation to visit Kirby Hall, and afterwards to examine the new quarry. It was a treat to the majority. Kirby Hall is not familiar to every architect, and it could be examined on Friday in good company. There were no amateurs to spoil the enjoyment by

crude theories, and it was possible to study and sketch without a fear of being bored. It was no wonder that so many architects endeavoured to grow young again, in emulation of Mr. EWAN CHRISTIAN, who appeared to be able to see more of the building than any of his companions. But as Weldon stone on Friday assumed greater importance than Kirby Hall, it is right we should lose no time before speaking about it.

In the report of the commissioners who were appointed to seek after the most eligible stone for building the Houses of Parliament, there is no mention of the Weldon quarries. Northamptonshire, which is rich in stone, is represented in that document solely by the oolite from Barnack Mill, near Stamford. Weldon stone was, however, at one time recognised as possessing many good qualities, but in 1839 the commissioners would have had some difficulty in obtaining a sample, for the quarries, in common with the rest of the estate, were neglected by the owner. According to local tradition, which is not to be despised in such cases, Weldon stone was used in Old St. Paul's. It may have been the material that was specified for constructing the vault of King's College Chapel, Cambridge; and it is recognisable in the walls of churches and other buildings in Northamptonshire. What is called Ketton stone in some descriptions appears to have come from one of the Weldon quarries.

A glance at a geological map will show that Weldon lies upon the oolite formation, which may be described as stretching from the Humber to the Severn. There are several varieties of oolites, but generally their granular character is so marked as to give rise to the theory that they are derived from ancient coral beds. The Weldon stone might be selected as a typical oolite. When taken from the quarry it is a dark shade of the colour which, for want of a better word, is called "creamy." After a time it becomes grey. In its original, as in its transformed state, the colour is very pleasing. The stone is homogeneous and close in grain, it weighs about 140 lbs. to the cubic foot, and in other ways has some analogy with Ancaster. The crushing weight, according to MESSRS. KIRKALDY, is 140 tons per square foot.

It must be said that whoever had charge of the arrangements at the quarry at Weldon on Friday last, was not aware of what is essential if an architect has to judge of the value of a building stone. An experiment could only be conducted in a manner that was not satisfactory, and was hardly likely to serve the interests of the owner of the quarry. There was no preparation for any tests. For instance, when water was poured on the side of a block, which would be the part to withstand rain, it was absorbed with a rapidity that was remarkable. The phenomenon was enough to raise a prejudice against the stone. It is quite possible that some of the stones which were discovered to be so peculiarly porous were only a few hours out of the quarry, and if they had been properly seasoned one might have observed a different result. But in order to ascertain the absorptive power of a stone something else is needed besides dashing dirty water upon its face. Specimens ought to be shown which were soaked in water for several days, and means provided for weighing stones in a dry as well as in a saturated state. It is not difficult to suggest the influence of the atmosphere by a process that is comparatively simple, and it might have been employed at Weldon without incurring much expense. As regards the workable qualities of the stone, nothing was to be seen that had lately passed through the hands of a mason.

It is to be regretted for his own sake that Lord WINCHILSEA had not consulted an architect or a contractor about his arrangements. If builders like Mr. THOMPSON, of Peterborough, Mr. DENNETT, of Nottingham, or Mr. PATTINSON, of Sleaford, who were all present, had been asked for advice, the quarry must have presented a different appearance. They would be able to bring forward the kind of evidence which is needed, if the qualities of a stone are to be recognised by architects.

If, through mismanagement, it was difficult to realise the value of Weldon stone from a visit to the quarry, fortunately there were other means available for the visitors. Kirby Hall and Geddington Cross were enough to convince the most sceptical. In the former ingenuity seems to have been exercised to bring the building to ruin. But, in spite



of all that could be perpetrated by the owners to aid the work of time, the condition of the masonry might be said to be perfect, and the carving seems to retain its original sharpness. The fluting of the pilasters and the most exposed arrises continue to be true in line. Where finials remain they retain all their parts unbroken. Indeed, the strangeness which strikes a visitor on first seeing the building is partly owing to the contrast offered by the soundness of the masonry with the frailty of the carpenter's work and the absence of roofing. We can see there a remarkable example of what lawyers call "extraordinary decay." If a wall should need reparation in any part it is owing to man's hand, for the stone seems capable of resisting atmospheric agencies for ages. On looking at Kirby Hall one feels that an exceptional cause must have brought about the destruction of a material that was made to endure, and that it operated in a capricious manner. Ruins are not uncommon in England, but we doubt if another can be found which is so much of a puzzle in its combination of strength and weakness as the seat of the HATTONS.

Geddington Cross was erected about three centuries earlier than Kirby Hall, and was more exposed to danger. It stands in an open space in the village, and has figures and symbols which at one time would be regarded as accessories of a superstition, and which a loyal and orthodox man was bound to destroy. Geddington was not an excitable place, and as the structure found few enemies among the inhabitants, it has survived the wear and tear of six centuries. It is, in fact, the best preserved of the Eleanor Crosses. Assuming that Weldon stone was used in its construction, we must admire the toughness of a material that after so long a time presents the most delicate detail of the canopies on the three sides, as if it were the work of yesterday.

Rushton Hall, which was afterwards visited, is also an example of what can be done with Weldon stone. This large mansion is now occupied and forms a most comfortable dwelling. There was, unfortunately, no time for so close an examination as the building deserves. It is not as consistent an example of Elizabethan work as Kirby Hall, for the builders were able to employ mouldings and ornament which would appear more apposite in a building of earlier style, as they were evidently modelled on Mediæval precedents. But few would care to think of details when impressed with the general effect. The house must have undergone restoration, for the residents need not suffer inconvenience for the sake of archæology. The grounds are laid out in a way that would gratify a landscape painter, and the remarkable triangular tower, which was erected by Sir THOMAS TRESHAM, forms a termination for some of the avenues. The tower is also said to be constructed of Weldon stone, and the symbolic devices which cover the front will, therefore, long remain as a testimony of the designer's faith, which no sufferings could overcome.

Judging from the action of water on some of the pieces in the quarry, it might easily be concluded that a building of Weldon stone would always give free passage for moisture from without. It is evident, however, that some chemical or physical action occurs, through which the pores are effectually closed. How long it takes to accomplish this change was not revealed, and it is to be regretted that somebody was not present at the quarry who could talk about the stone with precision. Some of the remarks of Mr. THOMPSON at the luncheon might be easily interpreted as a warning against its general use, for he was emphatic about its porosity. We believe that if not used immediately after it is quarried, there is little danger of the stone being an aid to dampness. Besides, the absorbing power of a stone is not by itself the best test of strength, as is seen with sandstones, which disintegrate although they are not very absorbent. Weldon stone has weight and cohesive power, and the buildings where it was employed show its endurance. The colour is always pleasing, the stone can be got out in blocks of great size, and there is apparently remarkable uniformity in quality. If the quarries are conducted with prudence, there is a likelihood that the stone will be sought after, for it is said to be easily worked, and, with the aid of the Midland Railway system, it can be delivered at a reasonable rate in London or elsewhere. When it is known that

the profits are to be assigned to the restoration of Kirby Hall, every one who admires English architecture must wish that Lord WINCHILSEA will be successful in his experiment.

#### RHIND LECTURES IN ARCHÆOLOGY.

THE first in the series of Rhind Lectures in Archæology, Edinburgh, was delivered on Friday by Dr. Robert Munro, on the "Lake Dwellings of Europe."

Dr. Munro began with the geographical distribution and details of the remains of lake dwellings, dealing in particular with the stations discovered in Lake Zurich and Western Switzerland. He related how the first discovery of a lake dwelling had been made at Ober-Meilen, on Lake Zurich, in the winter of 1853-54, when some of the inhabitants, taking advantage of an exceptionally low state of the water to reclaim ground at the margin of the lake, came upon wooden piles, stone hatchets, stag-horns, and other remains. The discovery had not attracted much notice until the attention of Dr. Ferdinand Keller had been called to it, and an examination led him to the conclusion that these piles, systematically arranged, had formerly supported a platform, and that on this platform huts had been erected, which at a later period had been destroyed by fire. This discovery and the explanation of it led to other discoveries of the same kind in Lake Zurich, in the neighbouring lakes, and all over Europe; but in Lake Zurich it was the extraordinary activity of the people of Zurich itself which had led to the greatest discoveries. The ornamental quays, gardens, and promenades, begun about five years ago, by which they had completely transformed the shores in the immediate neighbourhood of the outlet of the river Lemat, had been filled up by materials dredged from other parts of the lake, and these operations had revealed lake settlements at Wollishofen, Kleinhafner, Banschanze, and other parts of the lake. In these remains of all ages had been discovered, most of all at Wollishofen, where, along with relics of the stone age, were brought up implements which showed that it had existed during the most flourishing period of the bronze age. Knives with ornamented handles, ornamented spear-heads, armlets, and ornamental dishes, all betokened a certain advancement among the inhabitants. Leaving Lake Zurich, Dr. Munro went westward, and dealt with the group of lakes, Neuchâtel, Bienne, and Morat. He related how attention had first been drawn to the subject of lake dwellings in the district by the discovery of a steinberg in Lake Bienne, covering three acres, and rising gradually from a depth of 20 feet to within 7 or 8 feet of the surface. Among these stones the heads of piles had been discovered, and examination showed that a lake dwelling had existed there, and was exceptionally rich in antiquities. A further search showed half a dozen settlements to have existed in Lake Bienne, and Government operations for lowering the level of the lakes in order to reclaim the delta of land between them brought to light numerous other dwellings. In Bienne sixteen were discovered; in Neuchâtel fifty or sixty, and the most interesting of these were noticed by the lecturer, and the most remarkable finds described and illustrated by diagrams. Similarly he described the settlements in Lake Geneva, fifty or sixty in number, and in several of the small western lakes. Speaking generally, he noted how the stations of the bronze age were further out from the shore than those of the stone period, and how the character of the implements as regards workmanship improved in the more westerly settlements. Comparatively few of the celts of Eastern Switzerland had a socket, and in the whole of the Wollishofen discoveries there was not a single knife with a socket, while in Western Switzerland the reverse was generally the case, and numerous objects were found tin-ornamented.

The second lecture was delivered by Dr. Munro on Monday afternoon. Beginning with the settlements of Robenhäusen, in Eastern Switzerland, he remarked that investigations had shown that these pile dwellings formed an irregular quadrangle a little over three acres in extent. The piles were of oak, beech, or pine, and it was calculated that 100,000 were required for the whole settlement. They were now several hundred yards from the present margin of the lake, and the remains were found under 5 or 6 feet of peat. There could be no doubt, however, that originally they were surrounded by water. The nearest land on the east side was 2,000 yards, and on the west side 3,000 yards; but notwithstanding that great distance, there extended a gangway from the settlement, the remains of which could yet be traced. This was one of the most famous settlements that had been discovered in connection with lacustrine research. It appeared from the testimony of the piles that the settlement had on two different occasions been destroyed by a conflagration, and of these there existed ample evidence in the charred remains of wood, food, cloth, and other articles. The settlement had been rebuilt after the second conflagration, and had evidently for some cause been aban-



doned—probably owing to the steady accumulation of the peat around it. From Robenhausen a large quantity of remains had been got, including a canoe, a yoke made of hazel branch, and an assortment of knives, clubs, stone axes, pottery, and a smelting clay crucible, in which traces of copper were found. The settlement of Niederweil was discovered, as was that just mentioned, by peasants cutting peat. The dwellings had been constructed on a series of artificial islands, and there were no evidences that they had been burnt. The pottery found was very curious. Some of the fragments were ornamented, others were neatly polished, and had handles of finished form.

A considerable portion of the lecture was devoted to a description of the settlements of Lake Constance, the sheltered bays of which seemed to have had a great attraction for the lake settlers. Those found now were mostly at the lower end of the lake. If they existed at the other end they had been covered up by the silt of the river. From the settlement at Wangen as much as 100 bushels of charred corn had from time to time been collected, and from the quantity of charred applecores that had been found it was evident that the inhabitants manufactured some kind of drink. Most of the settlements belonged to the stone age, but some came down to the bronze age. At Bodman, at the extreme end of the Uhdlingen See, specimens of glass ware had been found; and at Maurach as many as one thousand nephrite hatchets. At Schussenried, on the Foedersee, it was pointed out that the platforms were constructed like a fascine—between each transverse wooden layer there being a bed of clay. Here a substance like asphalt was found, which it was believed the lake dwellers made from birch bark and smeared on their vessels. The pottery was ornamented. The lake settlements in the Danubian basin were next referred to—Starnberg, Mondsee, Attersee, and Laibach. At Starnberg articles had been found which pointed to the fact that this settlement had existed from the stone age until early Christian times. At Mondsee pottery was found beautifully ornamented. Deep incisions had been cut in the sides of the vessels, and some white substance run into it. Here also was found a curious double fork or dagger not got elsewhere. The Laibach Moor, it was observed, comprised an area of about 85 English square miles. At one time it had been a beautiful sheet of water. The remains of lake settlements had been found in the peat. These included, in addition to the usual implements, a sort of crucible, and a mould for casting hatchet heads. There were also hooks for fastening cloth, and a kind of phantom minnow for catching pike. The most curious thing found was a curiously constructed piece of mechanism, about 32 inches in length, having valves and hinges in the centre. It was identified as resembling the traps found in North Germany with which fish otters were caught. But at Laibach no remains were found of fish otters, but about 140 skeletons of the beaver had been found, though there was no historical record that such animals had ever existed in this place. This ingenious piece of mechanism, however, was no doubt the beaver-trap of the old lake dwellers.

#### ROYAL SCOTTISH WATER-COLOUR SOCIETY.

THE first Exhibition of this Society since it was honoured with the title of "Royal" was opened to the public in the Institute Galleries, Sauchiehall Street, Glasgow, on Saturday, two hundred and eighty-three works having been hung. At the customary luncheon, held in connection with the Exhibition, Mr. Francis Powell, president, occupied the chair.

The President, after the usual loyal toasts, proposed "The Royal Academies of Art." All institutions of long standing, he said, were liable to err by opposition or indifference to change, and a slowness to recognise new movements. The vested interest of age and the continuance of thought in old channels delayed the acceptance of fresh conceptions, but it was essential that the Academies should be alert to every dawning phase of art. For art, to live, must be progressive. There was no standing still. History showed that when advance ceased, decline commenced; and, therefore, every sign of fresh vitality should be hailed with joy as a probable new era in art. At present the people mixing in the artistic world could not have failed to notice a change taking place in the ideas and scheme of work by the leading young painters and their followers, which was broadly designated the new French school, for the first seeds germinated and radiated from across the Channel. It was very much scoffed at by many, as were in years gone, first the pre-Raphaelite movement, and later the *Æsthetic* feeling. Yet, who could deny that from the advent of each of those developments of art, painting gained, receiving regenerated impulse and life? And such, he had no doubt, would be the result of the present departure. It seemed to be their duty to urge the Academies to encourage that outcome of budding thought, though it might not accord with the views of former practice.

Mr. Colin Hunter, A.R.A., responded on behalf of the Royal Academy.

Mr. W. D. Mackay, R.S.A., replying for the Royal Scottish Academy, said it was no sinecure to be a member of the Academy at present, and if one read all that was said about it, he would have a bad time indeed. During the past few weeks a great friend of his own had written a work entitled, "Every Man his own Art Critic." In that work—which was one of no ordinary ability—they were told that, although the Scottish Academy had not taken quite to the pompous vulgarity of the body to which Mr. Hunter belonged, it had outdone it in the imbecility of its aims. It was all very well for that author to indulge in swearing at large in this way, but it would be difficult for him to name any of the leading Scottish artists for half a century after the institution of the Academy who did not belong to it. One exception there was—he meant Milne Donald, of that city—but he died young, and he had no doubt he would have been recognised by the Academy had he lived a few years longer to reap the honour he well deserved. Of course, the Academy did not arrogate to itself the credit of having given birth to art in that country. It was the culminating point of a movement which had been going on for some time before its institution, and it was the outcome of a great deal of artistic ability which existed in the country. During the half-century succeeding its institution, the history of the Scottish Academy was very much the history of art in Scotland. For himself and the other members of that body present, he had to say that they were certainly alive to what the President had said about what was fit and good for one period not being fit and good for another. He had some hopes that they would be able to move on the lines he had suggested, and that they would be able to make their body representative not only of the art of Edinburgh, to which it was now very much confined, but of that of the whole of Scotland. In regard to the new phases of art which had come upon them, he thought, while they should certainly be alive to the importance of keeping their eyes open to all those movements, there was another aspect which was not quite as obvious. In art as in theology, there was that which was permanent and that which was transitory; and in an article on John Pettie he had seen it stated that the art of Scotland had done more than the art of any other country to keep up the connection with the great art of last century and the one before, which was surely no small thing. Consequently, whilst they were open to new influences, and striving some of them to open themselves to them even more, it was perhaps not a bad thing for them to move cautiously. Like the old mail-clad knights, the Academy had to move slowly, for it was invested with a Royal Charter; and although there was a possibility, of course, of something being done in the way of revising that document, it required to be gone about with great circumspection.

Mr. William McTaggart, R.S.A., in giving "The Glasgow Institute of the Fine Arts," observed that in listening to Mr. Mackay he thought that art in Glasgow, as in Edinburgh, was surrounded by great difficulties. Whether they called themselves new or old lights, or whatever name they assumed, art itself was eternal, and it had an undying romance which helped to keep them all with a sincere and healthy interest in it even if they had not a healthy understanding of what it meant. With that interest, they were gratified both to see the results produced by the new school, and to hear that Scotland had kept a closer alliance than even England with the great artists of the world. In travelling on the Continent, people had said to him, "Oh! you are a Scotsman—you come from the land of poetry and romance," and he had thought surely the fine arts had something to do and to say in the matter. But the troubles that surrounded them! Difficulties met them year after year; and they had uphill work in getting people to inspect collections of pictures, while their critics sometimes compared them to first, and at other times to second and third rate men, which was not intelligent at all. Of course, he supposed they must put the one against the other, and make the best of the result. The Institute, which had done and was doing good work, should endeavour to rival the Exhibition in getting together a collection of pictures to attract the public, for it had been demonstrated that the Scottish people, especially those of the west country, would turn out to such sights in thousands and in millions. The Institute, though entirely an exhibiting body, stood in the same relation to artists as the Academy, and it had distinctly more power to gather a fine collection of pictures—lines, he thought, on which it could do a great deal of good. Scotland suffered from her artists leaving her, but in this country no man was considered to be a great man until he became an Englishman. Until an artist became a Londoner he was only a provincial, and he was treated accordingly. Despite that, he hoped the Institute would do its best, and he thought there was a prospect that, in the future, men would be more content than they had been in the past to stay in Scotland, and to paint for the Scottish people. For he thought there was something contemptible in



an over-love of appreciation, just as there was something contemptible in an over-craving for commercial success. If the Institute prevented an exodus of the best men from the country, it would assuredly do a good work.

Mr. D. E. Outram, in replying, said the only difference between the Society and the Institute that he could think of was the framework of the Institute. It was not only different from the Society's, but from all other art societies, as far as he was aware. It was not like the Royal Academy or the Scottish Royal Academy, and such like, for they consisted entirely of artists. It was not like the Manchester or Liverpool Associations, for they were composed entirely of laymen. But Glasgow had the merit of originating an Institute composed both of artists and laymen. It was, therefore, of true Glasgow manufacture, and so bound to succeed like all their enterprises down to the great Exhibition. They thought this peculiar feature in their constitution showed the far-seeing intelligence of their founders. It united artists with laymen, and laymen with artists, and by this combination they brought the benefits of their various experience and respective talents to promoting the object they all had so much at heart. It surely was a mistake to suppose that laymen were one whit behind artists in their enthusiasm in the promotion of art. If that was the case, then how much better that they should be associated together in the same work! It surely would afford all the benefits that unity proverbially conferred. But besides this, laymen had wide associations. They could spread abroad the knowledge of art and of pictures better than artists, who would be thought trumpeting their own cause. Then they were generally men of some substance, who could give tangible proof of their zeal by buying pictures and showing them to their friends, who naturally followed their example. Then they were very often travellers to far countries, and so could import a knowledge of foreign art as interesting and beneficial to artists at home as foreign manufactures were to our manufacturers. This was just the benefit of international exhibitions, for art had no limits to its sphere, and it was the glory of artists to have no peculiar nationality. Their Academy was that of the world itself. The Exhibitions accordingly had been more than usually interesting. Artists from other cities had said to him, "This Exhibition is not like others; it is cosmopolitan." Surely it was the best policy for the sake of art, of artists and art, to make the Exhibitions as much so as possible. It was thus that the Institute was working its way quietly, independently—for the civic rulers gave it literally no assistance—and successfully. Its success, he thought, was proved by the splendid band of talented artists that Glasgow could boast of already, promising to make that city take the highest rank yet in the school of art. It would have done so already, he did not hesitate to say, if so many artists had not—should he say unpatriotically?—migrated to London. Should they make a Glasgow school so distinguished that they will be glad to come back again?

Mr. P. S. Dunn proposed "The Royal Scottish Society of Painters in Water-Colours."

The President, in replying, said that the honour conferred by Her Majesty on their Society, by placing them in rank with their London prototypes, was a distinction of which they were very proud. They should have to live up to this honour, and show by renewed energies that in painting as well as title they were worthy of such position. When he looked around the walls at the work of his *confrères* he felt that they had only to keep shoulder to shoulder with heartiness and oneness of purpose to raise their Society to the highest level. The burning question with water-colours had always been, "Will they fade?" He had often spoken on this subject on these occasions, because it was of paramount interest to the aquarellist and collector to know the truth, and he would not apologise for doing so again. Last week he received the Blue-book report of the Commission of experts appointed by Government to investigate the action of light on water-colours, which investigation, after two years' most exhaustive experiments, was now concluded. The result showed that the permanence of their charming art was in their own and the collector's hands—in the first place by the artist selecting his colours, and, in the second, by the purchaser keeping his drawings free from damp. There were twenty-two pigments, comprising six yellows, one orange, four reds, four blues, four greens, two browns, and one grey, which, when painted on Whatman's drawing paper, resisted in dry air, without the slightest change, the action of the direct sunshine during the two years of observation, which was a calculated equivalent to the bleaching powers of 480 years' ordinary daylight in a room. With these permanent colours and their combination they had an endless variety and scale of tints. Such being the case, no water-colourist need in future seek perishable material to produce the most luscious colouring, and the connoisseur might know in acquiring these works he was securing the most durable as well as the most beautiful description of the painter's art.

Other toasts, "The Guests," "The Chairman," and "The Croupiers" followed.

## TESSERÆ.

### Coloured Materials in Architecture.

A. H. CHURCH.

THE whole subject of the use of natural and artificial colour in architecture and sculpture is fraught with difficulty. We cannot, however, go far wrong if we interfere as little as possible with the picturesqueness of nature's chromatic arrangements whenever they possess a distinctive character; with uncoloured and less interesting marbles and stones, the case is certainly different. With pure white marble, having a slight translucency and a beautiful sub-crystalline texture, it often seems better not to interfere by any additions of artificial colouring. The substance appears so thoroughly fitted for the presentation of ideal forms that even the barest suggestion of realistic colour may look like sacrilege, and may easily lapse into vulgarity. This degradation is more particularly liable to occur when the sculpture is placed near the level of the eye and in a good but not very strong light. And here a curious effect of very powerful illumination and of a dim light may be noted. Strongly coloured surfaces are rendered pallid by brilliant sunshine, a clear atmosphere and a deep blue sky, reflecting under such circumstances an augmented proportion of white light. And when the light is dim, as in the interior of many an Eastern dwelling, the most decided colours lose their staring and obtrusive character, and merge into a harmony of darkened tones. In England we generally have to deal with the effects of a moderate degree of illumination, and in consequence we cannot reckon upon any considerable modification of the decided colours we may employ. In architectural interiors, where poor-looking or inferior materials (whether wood or stone) are employed, widely divergent opinions have been urged as to the mode in which artificial colour should be distributed. If the lines, contours, mouldings, and carvings are good, it is argued that they do not need accentuation with colour; if they are weak and poor, colour will but bring out their defects. And a scheme of artificial colouring, if quite independent of architectural forms, has the great drawback of breaking up the structural unity of the work. On the whole, it may be concluded that the only safe course is to arrange and calculate beforehand the scheme of form and colour as a united whole.

### Effect of Frost on Stone.

G. R. BURNELL.

The principal danger of exfoliation arises from the expansion of the moisture contained in the stone under the influence of frost, and a very elegant process was invented by M. Brard, for the purpose of ascertaining the probable extent due to this cause. M. Brard in his experiments upon the resistance of stones, caused them to be boiled for half an hour in a saturated solution of the sulphate of soda. They were then withdrawn and allowed to stand in a flat vessel, at the bottom of which was a small quantity of the same solution, the first efflorescences were washed off, and the degradation of the stones during the next five or six days, under the effects of the continued efflorescence, were taken as an indication of the probable extent to which they would be affected by frost. In the first volume of Rondelet's "Art de Bâtir," p. 307 (ed. 1842, Paris), M. Brard's process is described in detail; but some very curious experiments recorded in vol. 7, "1<sup>re</sup> serie des Annales des Ponts et Chaussées," by M. Minard, together with an article by M. Vicat, inserted in the same volume, throw very considerable doubts upon the exact amount of dependence to be placed on its indications. M. Vicat, indeed, very properly observes that it still remains to be proved that the expansive action of water in freezing is identical with that of crystallisation, which can only produce energetic effect at temperatures between 68° and 86° Fahr. According to this very accurate observer, stones which are exposed to a southerly aspect, on the north of the equator, are more affected by frost than those exposed to the north; and the most efficient protection to materials of this description of a porous nature is a coating of oil paint, or any other fatty pigment which prevents moisture from being driven or absorbed into the stone. M. Minard recommends that stone should be quarried in the spring, and not employed in a building until it has been exposed to the effects of one winter at least.

### Relation between Stained Glass and Architecture.

C. WINSTON.

It will be admitted, I apprehend, that the earlier Gothic styles are more severe in their architectural character than the later ones, and also that the glass most in harmony with Gothic buildings in the Norman or Early English styles is that of the twelfth and thirteenth centuries. I have tried for a long time past to discover the reason of this conformity, and have arrived at the conclusion that the harmony between the painted windows and the architecture depends far more on the colouring of the windows than on their design. I have often



contemplated the general effect of thirteenth-century, of fifteenth-century, and even of sixteenth-century painted glass in the windows of a Norman or Early English building, from a distance too great for admitting of my making out the design with any degree of distinctness, and have invariably observed that the colouring of the earlier glass most accorded with the character of the architecture, and that the harmony was the same, whether the windows were almost entirely formed of white glass, like the Five Sisters at York, or were richly coloured, as at Bourges or Canterbury. As might have been expected, I have not met with the same opportunities of contrasting the effect of thirteenth-century painted glass with that of the fifteenth or sixteenth century, in reference to its harmony with the architecture of the sixteenth century; but such experiments as I have been able to make have tended to create an impression on my mind, that the glass paintings of the fifteenth and sixteenth centuries do harmonise more completely with the character of the architecture of the fifteenth century than the glass paintings of the thirteenth. However, without pressing the last point, I will venture to express a firm belief that the colouring of a sixteenth-century glass painting does harmonise better with the character of a building in the Renaissance style than that of a thirteenth-century glass painting. In these conclusions I have been influenced by the general effect of the glass painting rather than by its force, because I have remarked that good cinquecento glass paintings, which are hardly, if at all, inferior in power to Early English ones, do not in general harmonise with thirteenth-century buildings so completely as the windows of the thirteenth century. The inference I draw from these experiments is that there is an analogy between the colouring of twelfth- and thirteenth-century windows, and buildings remarkable for the gravity and solemnity of their appearance.

#### Vasari's Biographies.

B. R. HAYDON.

It has occurred to me as a curious question, why Vasari's lives are sold throughout Europe better than any other painter's lives, and the reason is, they are not exclusively professional, though a whole code of technical practice can be ascertained from his occasional technical allusions, both on fresco and oil, execution and cartoons; but I will venture to say if these utilities had been their only merit, they would have lain unread, except by artists all over the world. Not so Vasari; he had more sense. Every man can read his lives and be amused, because he mixes up all the vices, virtues, follies, and tricks, characteristic of each artist. We know Michel Angelo, and Raphael, and Giulio Romano, and Titian, as well as if we had lived with them; he tells us all sorts of anecdotes of their private lives. Fuseli used to say to me, "What have we to do with their private lives?" I used to reply, "Everything." It is these touches of human character in every painter, the humour of Buffalmacco—the violent temper of Michel Angelo—the suavity of Raphael—that interests the unprofessional man, the general reader, and have kept Vasari the very Bible of painting, and ever will. Whereas in the lives of Fuseli, Lawrence, Reynolds, and Wilkie, each in succession is but a dry detail of professional correspondence, from which one retires harassed, disgusted, and sick; and after being published by a bookseller at a great expense, lie on our shelves after the first excitement, and are never referred to either for instruction or entertainment. Every painter's life could be made as delightful as a novel.

#### Old London Bridge Waterworks.

T. WICKSTEED.

In 1581 or 1582, Peter Morrys, a Dutchman, obtained a lease of the City of the first arch of London Bridge, on the north side, and erected a water-wheel, to be worked by the tide, and a set of force pumps to raise Thames water for the supply of the neighbourhood. The water was raised to the top of a wooden building 120 feet high, and passed from thence through pipes to supply the dwelling-houses in Thames Street, New Fish Street Hill, and Gracechurch Street, as far as a standard on Cornhill, which was erected in the middle of the street where the four ways meet. The water which was to spare, after supplying the beforenamed streets, flowed from the standard through four pipes branching to Bishopsgate, Aldgate, the Bridge, and Wallbrook, which supplied the dwelling-houses in the neighbourhood and cleansed the gutters in these streets. The site of the standard was supposed to be the highest ground in the City. The quantity of water raised was equal to about 3,170,000 imperial barrels per annum, or an average quantity of 216 gallons per minute, or about seven-eighths per cent. of the quantity raised by the waterworks for the supply of the metropolis at present. There were sixteen pumps worked by this wheel, each 7 inches diameter and 30 inches stroke. Mr. Smeaton ascertained from registers that the pumps made 3,025 strokes per tide; and, as there are 708 tides per annum (allowing one-fifth for loss through the valves, according to Dr. Desagulier's statements), the quantity raised may be calculated. Improvements, however, had been made before the

above particulars of the pumps were published, and therefore the quantity given will be the extreme probable quantity raised in 1582. In 1583 or 1584 machinery was fixed in the second arch. Improvements were made and the works continued in Morrys's family until 1701, when they were sold (after an engagement had been made with the City for a lease of the fourth arch) to Richard Soams, citizen and goldsmith, for 36,000*l.* Soams formed a company, and divided the property into 300 shares of 500*l.* each. In 1761 machinery was erected in the third arch; in 1767 machinery was erected in the fifth arch, and also in the second arch from the Surrey side for the supply of the Borough. The large wheel erected in the fifth arch by Mr. Smeaton was added in consequence of the reduction in the fall of water occasioned by enlarging the water-way under the bridge when two arches were thrown into one. And about this time an atmospheric engine was erected of 10-horse power to assist the wheels at neap tides, and as a safeguard in case of fire happening in the City at the turn of the tide, when the wheels, of course, could not work. In consequence of the City being obliged to pen up the water to work the wheels, according to an Act passed in 1756, in the twenty-ninth of George II., the blocking up of the arches became such a nuisance to the navigation of the Thames, that an Act was obtained in 1822, the third of George IV., for the removal of the London Bridge Waterworks, and they were removed accordingly, and the district was supplied by other companies, chiefly by the New River. At the time of the destruction of these works the number of tenants was 10,417, and the quantity of water raised by them was equal to 39,484,000 barrels per annum, or 2,704 gallons per minute; showing an increase equal to twelve times the quantity first raised in 1582 by Peter Morrys. In 1583 two conduits for Thames water were erected near to Old Fish Street Hill. In 1594, for the better supply of the City, Bevis Bulmar erected a large horse-engine and four pumps at Broken Wharf, to raise Thames water for the inhabitants of Cheapside, St. Paul's Churchyard, Fleet Street, &c., which, Maitland says, was removed previous to the date of his work, 1756, on account of other companies being able to supply water at a cheaper rate.

#### A Classification of Arts.

R. H. S. SMITH.

Among the objections that occur to the classifications of art commonly employed, whether historical, chronological, national, or other, is that they offer little explanation of the aberrations or inconsistencies of its development and very little of the analogies that are traceable in its efforts. I have therefore found it convenient to adopt in studying æsthetical questions a classification which corresponds to the broad divisions which have been suggested by ethnology. First, sensuous or instinctive art. Secondly, intellectual. Thirdly, moral or spiritual. A perfection appropriate and peculiar to each of these is capable of being attained apart from the others, but the combination of the whole, each in its own highest development, would be requisite to accomplish all that art is competent to reach; such a combination the world has not yet seen. The first division, that which I have named instinctive or sensuous, is the only art which exists among a vast portion of the human race—the whole of the first group into which ethnology divides man. The black races and the island people of the southern hemisphere do not attain any other art than this. A great portion also of the second group, the yellow and red races, do not rise above it. Respecting its characteristics and attainments I shall hereafter have occasion to enlarge. It is, therefore, only requisite now to observe that this instinctive art is not confined to certain groups of mankind. I may point to it among them, because it is the only art they possess. But it asserts itself among the nations who have proved capable of expressing themselves in the language which I venture to read as that of the two higher orders of art, intellectual and moral. The second division, distinguished as intellectual art, makes its appeal to human reason—to man's critical faculties; it forms its ideal from man. It summons the first class of art, sensuous or instinctive, to its aid, but rarely harmonises wholly with it. The perfection of intellectual art is to be found among the Greeks, who understood accurately and observed with subtle skill the faculties they desired to appeal to and the effect they sought to produce. All slavish reproductions of their art are therefore failures. The reproductions at Munich of Grecian temples turned into modern picture galleries are among the most notable examples of an error that arises from not fully comprehending what art is and the purpose it has to fulfil. A reproduction of any architectural work under different conditions of thought, life, climate, and use, is a solecism in art, and of necessity a failure. The third division is moral or spiritual art. The art which has its origin in man's noblest aspirations and makes its appeal to all that is highest in his nature. You may well believe that such art is rare. Its existence at all, the possibility even of its existence, implies that man looks higher than his own nature, that he has somewhat within him which is not satisfied with this earth alone. Painting, sculpture, and especially architec-



ture, afford examples of efforts at least made in the direction of this, our third and highest division of art. It also summons to its aid that which I have named sensuous or instinctive to supply fitting decoration, harmony, and splendour of colour, and in such combination this lower art may attain its perfection and yet be, as is just, in perfect subordination to the other. It also may, perhaps must, demand the aid of what I have characterised as intellectual art; the symmetry, completeness, and precision of this latter supply materials to complete the triumph that it could not itself obtain. The art that seeks to satisfy man's critical faculty only cannot reach his heart. In the ever-pending strife between emotion and reason, art is found enlisted sometimes on the one side sometimes on the other, but her greatest triumphs have been gained when reason has been satisfied, or nearly so, imagination aroused, and emotion stirred, but controlled.

#### The Mouldings of the Seven Periods.

E. SHARPE.

In the Norman period the mouldings are very simple and heavy, and placed at the corners of each of the orders of arches, but they are somewhat relieved and lightened in the doorways by zigzags, frets, &c.; still the round moulding prevails. I would observe that, notwithstanding this heaviness of appearance, the stones are not of greater depth than in any of the remaining periods, and the subordination I have described also prevailed throughout. I think an architect would therefore be inclined to say that the change of form which the arch gradually underwent was really by no means so important a change as a change in the mode of its construction would have been. The Norman orders were not heavier in regard to the size of the stones than those of the subsequent periods, and the workmanship of the Norman walls was, in reality, lighter than afterwards. In the Transitional period an increased lightness of effect is apparent in the mouldings, which assume a pointed form. We find also a peculiar form, which is of frequent occurrence in the Temple Church; we see still, however, the same general squareness of outline, for, though considerable portions of stone are cut away, the mouldings usually project to the angle of the stone. In the Lancet period the mouldings seldom or never come to the angle of the stone. There is a greater rotundity of appearance throughout. We have the tooth ornament between two rounds, the label moulding or hood moulding, and others peculiar to the period. In the Geometrical period the mouldings are distinguished by their elegance and minuteness. A common feature is the recurrence of little fillets, intersecting and combining with circular mouldings. You will observe the delicacy of these curves; and these, be it remembered, are in the doorways, for in the shrines, canopies, and smaller work, the mouldings are so minute and delicate, so light and elegant (many not  $\frac{1}{8}$ -inch broad), that one would scarcely conceive they could be executed in stone at all; yet, by the selection of a fine-grained stone, they were produced in the greatest profusion, and to an extent that we should now never think of imitating. And be it also remembered, these are not copies one of another, but original designs by men imbued with a general feeling, arising, perhaps, from education and habit, which is certainly capable of being identified. The mouldings are hardly ever copied; some particular group may be introduced from one subject to another, but they are generally slightly altered. In the later portion of this period, as at Guisborough, we have a continuous undulating form running through the whole series of mouldings. The orders begin to be larger; and later still, they increase considerably. Another circumstance also is perceptible, which is first seen in the Lancet period; that of placing the joints of the stones in a hollow. In the Transitional period (and of course in the Norman), that is never found to happen. Each order is there separately prepared, and one surface is placed against another, forming a right angle. In the later periods, the joints come in the hollows. In the Curvilinear period the hollows are broader and shallower, and the ogee form is one of constant occurrence. And I will notice here the gradual alteration of this form of moulding, which continually occurs in the Lancet period, and becomes modified in the manner shown. The double ogee first appears in the Curvilinear period, and is more common in the Rectilinear. Leaving the Curvilinear period, we find this flattening of the mouldings increased, as well as the breadth and shallowness of the hollows; and we have the three-centred hollow, corresponding with the four-centred arch; angularity of form in the label mouldings; with few or no mouldings of any projection; and I think we must admit that in the Rectilinear period the art of carving mouldings had very greatly degenerated.

#### The Vertical Line in Roman Architecture.

SIR G. WILKINSON.

It is universally admitted that the principal features which distinguish Greek from what may be called Church architecture are the horizontal line in the former and the vertical in the latter; and some have supposed that to church architecture is

to be ascribed the origin of the vertical line. That it is common to buildings of the Saracens, the Lombards, the Saxons, and the Normans, as well as to those of the Pointed style, is sufficiently obvious; thus far our experience tells us we have traced it, but beyond this conjecture has not attributed to it an existence, nor has its origin been ascribed to any more remote source. In the oldest Saracenic mosques, erected about the middle of the seventh century, the style of architecture is evidently borrowed from Roman buildings. Their arches are simply imitative of the Roman style; the windows, though small, have a round arched head; the corridors are formed of avenues of single slender columns supporting round arches, and the type of the Roman original is readily traced, as in the earliest churches of Europe, which also present the round arch of the Roman style. But in both these we find the lines already vertical; and that this might be expected from what we see in the monuments of ancient Rome is the point to which I wish particularly to advert. Those buildings erected by the Romans in imitation of the Greek, as temples, and some other monuments of a borrowed style, present the horizontal line of that architecture to which they really belonged, and of which they were copies; and, since we find this to be the case in all countries of modern Europe where Greek architecture is imitated (even though it is notorious that the vertical line is the prevailing feature of our taste) we cannot be surprised that the same should have been done by the architects of Rome. But whenever the Romans attempted any thing of their own, in which they thought a deviation from Greek models was allowable, we no longer perceive the horizontal, but the vertical line predominating; and to such an extent, that even a Greek entablature is sacrificed to this their favourite sentiment, being broken up into detached parts and compelled to project and recede, in order to allow the vertical line to pass continuously through it to the summit of the building. In an arch of triumph, a Roman composition, though the mouldings and many other details are borrowed from the Greek, the vertical line commences with the pedestal of the columns appended to its side, and extending upwards with the column, breaks through the entablature, which it obliges to come forward to carry out and mark its direction, requires a projection of the attic to correspond with the capital above the cornice, and terminates in a statue; thus continuing it uninterruptedly from the base of the summit of the building. This is not confined to an arch of triumph; the same occurs in other monuments, a remarkable instance of which may be cited in the remains of the Forum Palladium, or Forum of Nero (according to the Chevalier Bunsen), where the whole entablature is made to advance from the face of the wall to the distance of several feet, and is crowned by a similar projection of the attic, in order to correspond with the vertical line of the column which supports it; and the same taste for breaking up the horizontal line of Greek entablatures may be seen in numerous Roman buildings, the *ne plus ultra* of which occurs in the monstrosities of Petra. Thus then we find the vertical line did not originate with the architecture of Christian Europe; it occurs in the monuments of ancient Rome; and this interesting question naturally suggests itself, Whence did it proceed, was it of Italian origin? In the Rome of a Christian era the same occurs throughout its churches, which is the more remarkable as those churches are not of what has been termed Gothic, but of Greco-Roman or of Cinquecento style; and in these the vertical line extends from the lowest to the highest part. Even domes and cupolas are not exempt from its intrusion. It commences with the basement of the column, and, extending upwards through the projecting entablature and the attic, it continues in bands over the whole convex surface of the dome, requires a corresponding pilaster or half column in the lantern, and exhausts itself only in the extremity of the cross or whatever point terminates the building: a good example of which may be seen in the cupola of St. Peter's, whose façade—a memento of Bernini—not only unites the most glaring defects in taste but affords an illustration of the worst application of the vertical line. After viewing these monuments, and observing the feeling which pervades them, every one must be surprised at the sight of the splendid palazzi of Rome and other cities of Italy. In these we no longer perceive the vertical but the horizontal line predominating, which is carried out with wonderful effect, both in the rich and splendid cornices that crown the building and in the string-courses beneath the windows. In these no broken entablature injures the harmony of the straight line, no sinecure columns are suspended at the side of the walls to do nothing but spoil the effect of the whole mass; and we perceive that their architects did not put together a number of details to form a whole, but conceived the whole, and made the details accessory to the general effect. So evident indeed is this that the details are sometimes bad, and still the whole is excellent; as in many pictures of the great masters, where the composition and execution of the painting are of far greater importance, and far more striking to an artist than the imperfection of an accessory—like the sandal in the picture of Apelles.



## NOTES AND COMMENTS.

THE first decision of the Michaelmas sittings in the Court of Appeal related to a question of sale of house property. The Commissioners of Sewers purchased a house in Botolph Lane from the Drapers' Company, for the purpose of obtaining ground for widening the roadway, and paid 4,287*l.* for it. After a time it was found that the house could be spared, and the Drapers' Company claimed the right to repurchase. The Commissioners of Sewers agreed, but demanded 5,000*l.*, as the value of the house was said to be increased by the improvements in the neighbourhood. That theory was contested by the Drapers' Company, but the Recorder, in addressing the jury who tried the case, held that the additional value caused by improvements must be taken into account, and a verdict for 5,000*l.* was given. An application was made in a Divisional Court for a *certiorari* by the Drapers' Company but it was refused, and it was repeated in the Court of Appeal on Wednesday. Their lordships confirmed the decision of the Recorder. As a matter of justice, considered from a surveyor's point, and apart from technicalities, there can be no disputing the principle of the decision. The Drapers' Company exacted the highest price obtainable, and, having lost all interest in the house, the Company afterwards stood in the position of an ordinary individual, and therefore should pay the market price for the property under its new conditions.

THE Minister of Commerce has approved of the arrangements of the competitions for the diploma of the International Exhibition. The first will be general, the second will be restricted to five artists. The choice of subject is left to the designers, but allegory is allowable. A plain space is to be left for the inscription. The sketch designs are to be deposited in the Hôtel de Ville, Paris, before November 15. Five of the designs will be selected which are to be completed before February 1, 1889, and from them one will be selected, for which ten thousand francs will be paid. The four artists who were unsuccessful are to receive one thousand francs each.

At the present time it is not possible to see a large number of the pictures which are hung in some parts of the Musée Royal of Brussels. Several of the galleries containing examples of ancient pictures are covered by screens of white calico, which are not exhilarating to a visitor, and, somehow, the uncovered pictures seem to lose their value. The conservators are not, however, to blame. If the pictures are shrouded, it is with a view to their preservation. It is necessary to carry out some alterations in the sculpture gallery on the ground floor, and as the curators were of opinion that the dust might arise, and affect the paintings in the galleries above, it was determined to do something to preserve them. Hence the precautions, which are an eyesore to every visitor to the galleries. How long the pictures are to be concealed is a question which rests with the contractor.

M. GREBAUT, the successor of M. MASPÉRO in the direction of the museum of the Egyptian Government at Boulacq, is at present in Alexandria, where he is examining a sarcophagus which was lately found at Ramé, near Alexandria. It is supposed to contain the remains of ALEXANDER BALA, the Rhodian, who usurped the throne of Syria and dethroned DEMETRIUS SOLER about 150 years before the Christian era.

It is anticipated that Mr. WILLIAM JOHNSON, of Wandsworth, the contractor, may take an action against Mr. HELBY, one of the members of the London School Board, and against the printers of the Board, in respect of statements which have been published in the second volume of evidence given before the special committee on the work of the Works Department. The special committee propose that the School Board of London should undertake the defence on the understanding that an undertaking be given

by Mr. HELBY to repay to the Board all costs, charges, and expenses of every description in the event of malice being proved, and that an undertaking be also given by the printers to repay to the Board all costs, charges, and expenses of every description in the event of the action being lost by anything they may have done beyond printing the copies required by the Board.

It is once more necessary to undertake a restoration of the beautiful Fontaine des Innocents in Paris, although work of that kind was recently completed. People are beginning to find that the figures by JEAN GOUJON and PAJON cannot resist the atmosphere much longer. It is, therefore, proposed that the figures should be removed and placed in a museum, and substitutes provided, in the form of casts or copies in stone, erected instead. It cannot be supposed that the market folks will care much for the removal of sculpture.

THE Germans are pushing English traders very closely in Japan. In 1886 Great Britain imported 56,950 tons of rails and Germany 33,945. But last year, while the British trade was increased by no more than 7,500 tons, the German imports rose to 63,771—or nearly on an equality with the British. Rails are of very great importance in Japan. In 1886 Great Britain imported 37,409 tons, against 26,299 tons from Germany; while in 1887 Germany imported 35,222 tons and the English trade had fallen to 32,355 tons.

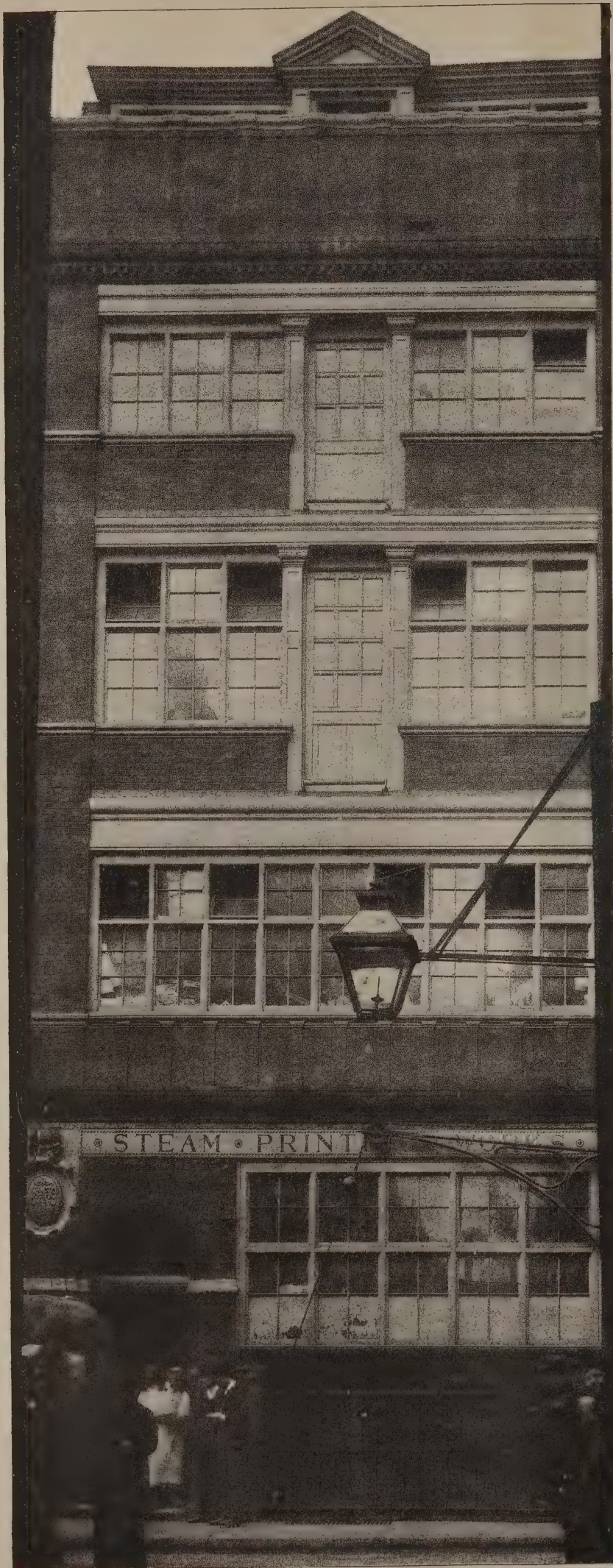
THE French Commission on the rebuilding of the Opera Comique have decided that the design is to be obtained by competition. This resolution was arrived at in spite of the influence of M. LOCKROY, the Minister of Public Instruction, who declared that it was unnecessary to seek for a design, since he had already presented one which was prepared by the Administration of Civil Buildings. At one time M. LOCKROY would have been the first to oppose such a proposition. It was also resolved at the meeting that a sum of 30,000 francs should be asked for in order to pay the expenses of the competition.

THE report of Vice-Consul PIETSCH on the timber trade of Memel during last year has not appeared until this month, when it is of little use as a guide to a timber merchant or builders. It is to be regretted that the Foreign Office will not take a hint from other countries, and recognise the importance of time as an element in business. M. PIETSCH is able to record an improvement in the timber trade of Memel. In 1887 the shipments amounted to 582,470*l.*, against 505,165*l.* in 1886. The report seems to indicate that the days for the use of Memel oak have departed in spite of the admiration for oak panelling. Odessa has now the trade. Business in oak beams is now of no importance, says the Vice-Consul. For the old stock carried over from former years 6*s.* to 7*s.* for crown, 10*s.* less for the second sort, was paid. The quantity brought down by the Russian dealers was quite insignificant, viz. 5,000 cubic feet, which fetched about one mark per foot. In oak wainscots no transactions took place worth mentioning. The competition of Odessa, from which port wainscots of the same quality as from Memel, with more suitable lengths, are shipped, is not to be overcome. The following prices were obtainable: 4*s.* for crown and 2*s.* 6*d.* for brack per running foot; for older stocks even these rates were not obtainable, and a considerable quantity still remained in stock. The new supplies consisted only of 1,040 reduced pieces per 18 running feet, against 3,662 in 1886. The trade in redwood and whitewood planks at Memel is also declining, owing to the competition of Sweden and Finland, and it is anticipated that the trade will soon be at an end. In red and white wood deals, on the contrary, a steady increase is observable. In former years, as planks were more in demand, merchants produced this article in large quantities, but now, the same being neglected and only to be sold with difficulty, they prefer the sawing of deals, the production of which pays well. The chief markets for deals are Germany and Holland.









PRINTING OFFICES, FETTER LANE.

HORACE GUNDRY, Architect









*The Register*  
*From the Wall Painting in the M*  
*By M.*



26<sup>th</sup> 1888.



"INV. PHOTO" SPRAGUE & CO. 22, MARTIN LANE, CANNON ST. LONDON, E.C.

tion of Birth.

ice of the 10<sup>th</sup> Arrondissement, Paris.

Blanchon

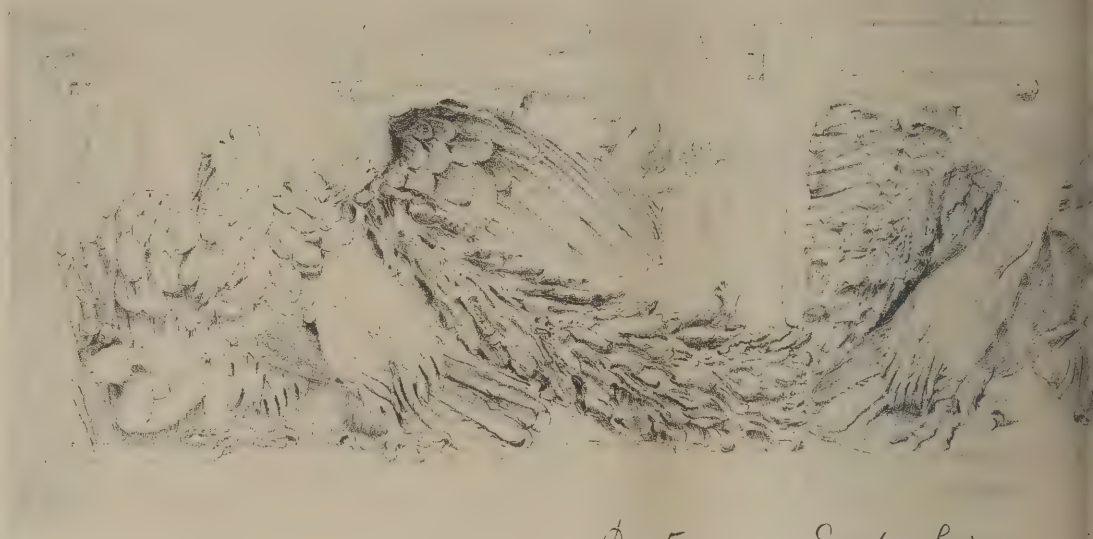




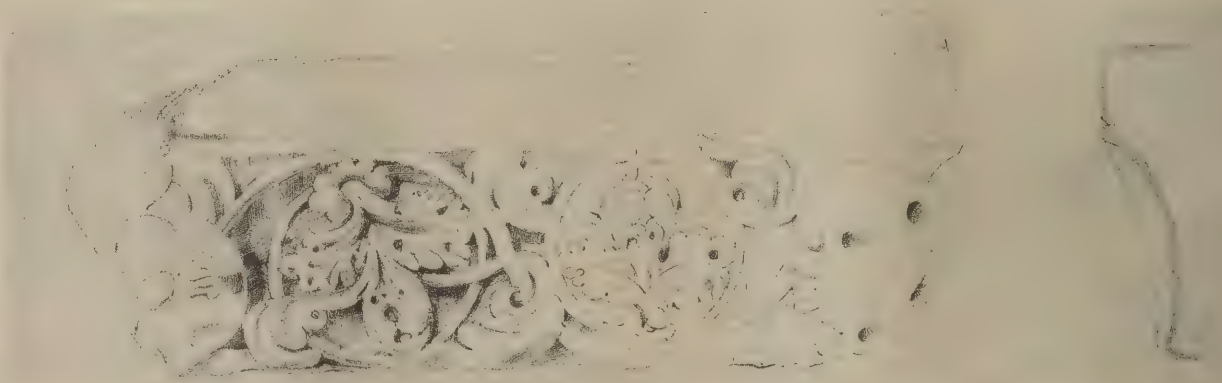




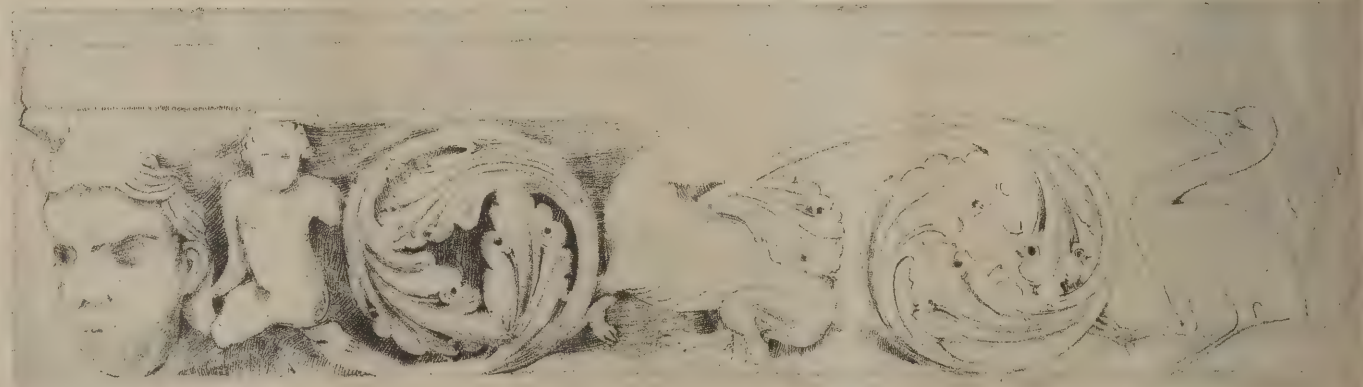




Portion of Eagle frieze - i

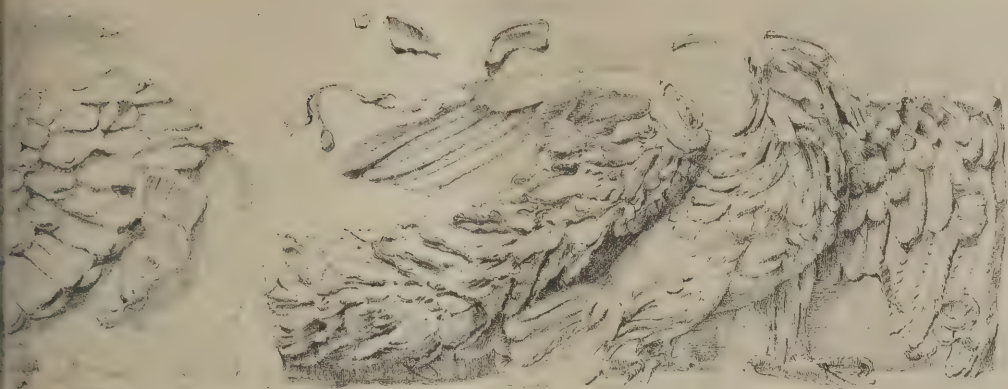


Fragment of Abacus - Niuro.



Fragment of Abacus - Niuro.



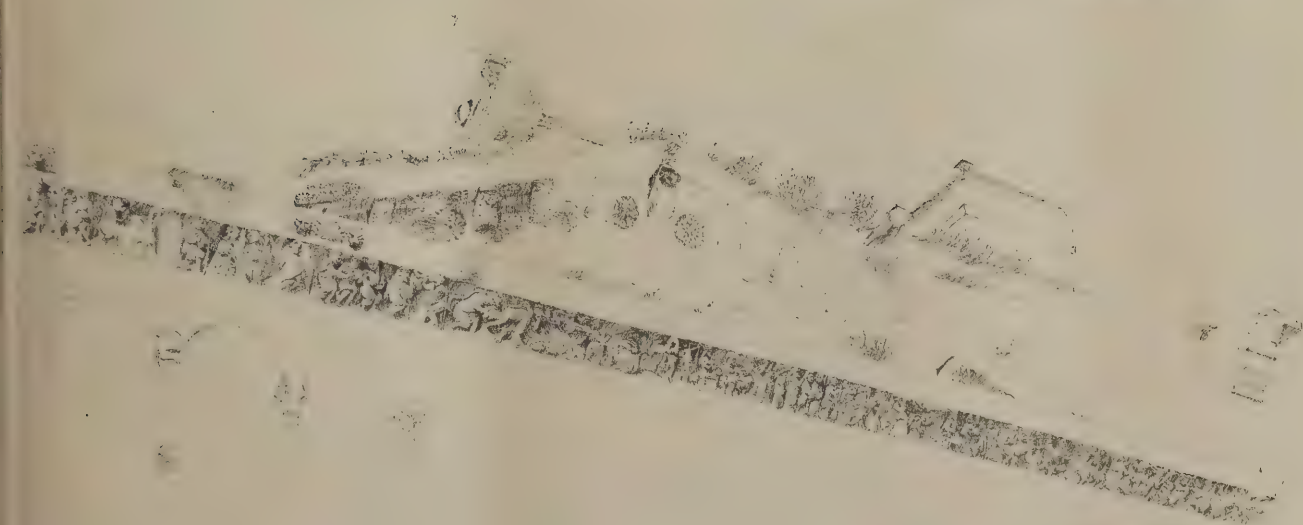


La Maison Carrée - Nîmes.



SARCOPHAGUS in the Cathedral  
NÎMES --  
used as an altar in the  
de Vieux Chœur  
Sketched by Z. Matthews Wilson July 1887

Nîmes. View of the West Front



The Cathedral.

Matthew Wilson









"INK-PHOTO" SPRAGUE & CO. 22, MARTIN LANE, CANNON ST. LONDON, E.C.

WAREHOUSE IN BROAD STREET, BLOOMSBURY.

JOSEPH PEACOCK, Architect







## ILLUSTRATIONS.

THE REGISTRATION OF BIRTH.

ONE of the works by which Paris is represented in the Exhibition of Monumental Art at Brussels is "The Registration of Birth," which M. BLANCHON painted in co-operation with M. GERVEX. It was the theory of the artists that art should take the office of the historian, or rather of the journalist, and present scenes as they take place in reality, and hence they painted "The Registration of Birth," a ceremony which obtains more importance on the Continent than in England, as every male is expected to serve the State in the national army. Hence, also, the care which was taken in the picture to represent the fashions of the time, although it was known they were to be fleeting. The painting, too, suggests that, as regards registration and the subsequent calls which it involves on all citizens, the poor as the rich are on an equality.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 33. SKETCHES FROM NIMES. [A. NEEDHAM WILSON.]

NO. 34.—PRINTING OFFICES, FETTER LANE. [HORACE GUNDBY.]

NO. 35.—WAREHOUSE. [JOSEPH PEACOCK.]

## THE ARCHITECTURAL ASSOCIATION.

THE first ordinary meeting of the Association took place on Friday evening, Mr. H. D. Appleton, F.R.I.B.A., president, in the chair. Mr. Hippolyte Blanc, of Edinburgh, was elected a member by acclamation. The annual report and balance sheet, which are printed in the Brown-book, were, on the motion of Mr. Cole A. Adams, seconded by Mr. S. Flint Clarkson, unanimously adopted.

Mr. E. W. MOUNTFORD, hon. librarian, announced gifts to the library, and a vote of thanks was passed to the donors.

Mr. T. R. FARROW, hon. secretary, gave notice that a special visit, for members of the Class of Construction only, would be paid to the works of Messrs. Measures on November 3.

The PRESIDENT, after distributing the prizes, delivered an address.

## President's Address.

That the Association has become in reality "The College of Architecture," affording the best preparation for the candidates for the Institute Obligatory Examination, I think cannot be denied; and with this important object only in view it has a great future before it. But looking to the terms in which the founders of our Society defined its objects, namely, "To afford facilities for the study of civil architecture," "To advance the profession," "To serve as a medium of friendly communication between the members and others interested in the progress of the art," it seems to me that there are other subjects besides the examination which claim our attention; and with this in view, I propose to consider one or two suggestions for increasing the scope of our work.

With the present method of carrying on our work by means of honorary instructors, we can still include many studies which are not at present taken up; but I am well aware that the system has very definite limits and possibilities.

Instruction by visitors who teach at night what they are practising during the day, and handing on the information they gain, qualified by their experience in its application to actual work, is the most direct method of teaching that can possibly exist. And the sympathy between the visitors and the students is much greater, and the subjects treated much more practically appreciated, than is the case when the instructor is dealing with a subject in which he has not this practical experience in working out the facts or theories that he teaches. It is this feature in our system which is the greatest cause of the success of the Association. The visitors in most cases, being young practitioners, know the exact points where the students find difficulties, and having only recently acquired their knowledge, often from painful experience, are able to impart a very vital interest to their explanations.

The benefit to the visitors is equally great, as it stimulates them to qualify themselves for the position they occupy as directors of the studies of the younger members, by thoroughly working up the subjects they undertake. But the number of the older members who act as visitors must necessarily be small, and I am anxious to see the scope of the Association enlarged so as to bring in a great many more of the older men into touch and work with the present working members.

The time has now come, in my opinion, when a new departure should be made in the work of the Architectural Association, by the organisation of a division for the study of modern design. We have in our classes excellent opportunities for studying the classical or archaeological side of our art; but the modern side is only treated in the class of design, and I think that, taking the ages of the members of this class, it will be found that they are a younger set of men than used to form the class say ten or fifteen years ago, and I am afraid that it would be difficult to make the class work if any large influx of older men joined.

But as each year the tendency of modern design is to free itself more and more from the fetters of precedent which used formerly to bind it down to rigid accuracy, surely it is impossible to ignore altogether in the working of this Association the influence that contemporary work has on modern design.

As far as the prize list is concerned, the Association offers no encouragement for the study of contemporary design, but rigidly draws the line at the eighteenth century. No prize, as far as my memory serves me, has ever been offered by the Association for the study of any building of a later period. In this I think that the Association is quite right, and if it were proposed to substitute the study of modern instances for the study of old examples, I am quite certain it would be a mistake. A careful training in the purer styles of Classic and Gothic must in all cases be undertaken in order to train the eye to their just proportions, and to appreciate the beauty and appropriateness of their mouldings and features. And the only way in which this can be satisfactorily done is by carefully measuring and plotting and sketching the actual examples of old work. In fact, without the study of old examples, half our interest in the good modern work of our best architects would be lost, because it is only through our knowledge of old work that we can appreciate the excellence of the rendering of the styles in which they work, and the wonderful manner in which they succeed in catching the spirit of it, that spirit that gives their work most of its charm. This is the way, and the only way, a student can start on his studies. And, therefore, I think the Association rightly limits the period of the buildings to be studied by her travelling students to those erected prior to the eighteenth century.

But still we cannot shut our eyes to the fact that the precedents for design are sought in contemporary work, and, whether we like it or not, the practice is on the increase, owing, in a great measure, to the number of illustrations that are published. And, this being so, it becomes a question whether we should not honestly admit the fact, and do our best to train our powers of analysis and criticism so that the selection shall at least be of the best examples. It would not be difficult with many a modern design by our best architects to produce the old examples on which they were based. A careful comparison of the original with the translation would show how much the master mind had used of the original, and how much was his own, and the process of analysis could go further—the translation might be from an original stone or brick treatment into terra-cotta, and to trace how the master had handled the detail so as to suit the new material, and stamp at the same time his own personality on the work, would be most excellent study; or, in other ways, how the nineteenth-century requirements were made to modify the original expression. It might, then, be a useful exercise for us to take the old example and try our 'prentice hands at a similar translation. I think, then, we should all acknowledge that the experience gained by the study of how a master workman had handled the subject before us would be of the greatest use in our own attempt. What we want is a careful training in analysis, so that we can learn to know what is good and what is bad in modern design. Then the visits made to modern buildings would be greatly increased in instruction and interest. But this power of discrimination can only be the result of careful training, and students should certainly not attempt to study modern work until they have gone through a proper elementary course in the purer styles. I am anxious not to be misunderstood. I do not for a moment propose the study of modern work for our younger students, or to in any way take the place of a careful study of old work by measurement, or sketching, or the study of all the valuable literature connected with old examples. But what I do lay stress on is that the work that is going on around us, and which is so abundantly illustrated, cannot fail to have a vast influence on our own work. We have here principles of design and pleasing forms of art all ready to our hand, and we should be more than human if we were in all cases able to resist the temptation to taste and handle the forbidden fruit.

It is in order to settle the proper position which the study of contemporary work should occupy in the education of our young practitioners that I venture to make the following suggestions, namely, to form a modern side in the Association which shall be for those members who have passed through the present more or less archaeological studies; and the first step that should be taken for the formation of this should be the institution of a common room, open every evening, where all



the members might come in contact—the young students using it for a waiting-room till their classes were held, and the men of the modern division for those interchanges of views on professional topics commonly called “talking shop.” It should be with a view of talking shop that they should congregate.

Without having any formal papers read or forms of discussion, certain evenings a month might be set apart for talking over subjects previously agreed upon, such as, for instance, one evening a month might be devoted to discussing the illustrations published in the professional press. But I am anxious to avoid formulating any programme, because I want this to be a common room and nothing more, where a member might be sure of finding another member willing—aye, more than willing, eager to talk shop. I am a great believer in talking shop, circumstance and place being appropriate. Then, in connection with this modern division, we ought to have an annual exhibition of illustrations of buildings actually erected, not only in the United Kingdom but all over the world. This would not be difficult if photographs had, as I venture to suggest they should, a prominent position; but these photographs should be accompanied in all cases by sufficient working drawings to thoroughly explain the principles of design in the buildings. These illustrations should be arranged in such a manner as to contrast the buildings designed for similar purposes, and in such order that they may be intelligently studied and compared with one another. This exhibition could, I think, without very great difficulty, be made a much more complete exponent of our modern art than the architectural room at the Royal Academy at present is.

The object of this collection, as I would suggest, should be to show the profession what is being done at the present time, year by year, to meet the architectural requirements of the age. It may be urged that the professional press does this sufficiently fully to obviate the necessity of a special exhibition. I am perfectly ready to acknowledge the wonderful profusion and beauty of their illustrations, and, for the purposes for which I propose this exhibition, the mere arranging of these illustrations in due order would go far to meet the purposes for which I suggest it. The Royal Institute would, I venture to hope, co-operate with the Association to make this exhibition as comprehensive as possible. Whether the public would be induced to take an interest in it or not, I think, is of little consequence; I only propose it as an instruction to the profession; but with the increased interest that is being taken in architectural matters, I think it not at all unlikely that the public would in time be found to take it up. During the exhibition each section should form the subject of one evening's discussion, and, if possible, not only the designs but the material and points in the construction be taken into consideration. Again, the designs submitted for the great public competitions, such as the Admiralty and War Offices, the Liverpool Cathedral and the Imperial Institute, should each in turn also form the subject of discussion in this common room; difficulties in points of practice met with by any of the members could well be discussed, and good advice obtained; in short, everything of interest to the profession should be considered at one time or another by these friends in council. By this means I hope to form a definite professional opinion on the actual work that is being done, which may have an influence on the work of the individual member. This modern division should also form an excellent opportunity for those of our members who have passed the age when they can readily avail themselves of the classes, but who are anxious to prepare for the Obligatory Examination. This could be easily done by the formation of reading parties, in which a definite course of preparation for the examination could be arranged, which might include time sketch designing as a practice for the design day in the examination.

Ours is essentially a students' society, and the whole of the work (or nearly so) now done in it is for the benefit of those who are preparing themselves for independent practice; but I contend that the objects of this Association are by no means limited to this, and I believe that the free expression of opinion on questions of design and construction would be of very considerable educational value to everybody concerned. In these latter days, with the increased liberty in design, there is not a little tendency to license, and doubtless there would be plenty of doubtful examples for the censors to draw their moral lessons from, and thus curb the ardour of the younger men and lead them in the direction of more consistent styles. And the fact of pointing out these things would, I trust, have an equally good effect on the censors, who might reflect that some of their own work might come under like condemnation. I know of no place where similar opportunities for the exchange of professional opinion can be enjoyed on so large a scale as would be possible if this scheme were carried out; but the general idea has been carried on successfully in several small societies which exist among our members, and I am sanguine enough to hope that it would succeed on the larger scale.

Although the number of old members who continue their subscriptions long after they have ceased to derive any benefit

from it is a very gratifying feature, it has always been a matter of regret to me that the majority of our members so quickly drop out of touch with the working of it as soon as they have passed through the classes, and it would be a most important step in advance if those members would revive their interest in the work of the Association. The sacrifice of time need not be very alarming, say one evening a month, and no pledge given, but just to drop in for an hour or two, and in a friendly chat help forward the matter under discussion, or to express an opinion either of commendation or the reverse on what is public property and open for criticism. In this way I feel sure a large amount of good work could be done, and it would be a great help to our younger men to have some guidance in the formation of their opinions on questions of design. And if you had to listen to some crude talk or advanced opinion from the younger men, it would do you but little harm—nay, I make bold to say it might do you some good. Greater enthusiasm and earnestness of purpose, as far as my experience goes, are rarely to be met with than amongst our members, and the kind attention with which they always receive any endeavour to help them in their work more than repays any trouble it may involve.

But I have dwelt, I am afraid, too much on this attempt to reintroduce an old and most important feature of the Association in its early days, and will now only just refer to our scheme for the affiliation of all the Student Architectural Societies with our Association, as this subject will have to be brought before another ordinary meeting during this session, in accordance with the rules which were passed a short time ago. I may, however, be allowed to briefly mention the most important features in the scheme. The first is that, as, in accordance with the new charter of the Royal Institute of British Architects, this Association will have a recognised representative on the Council, this affiliation scheme will, if successfully carried out, constitute him the representative of all the architectural student members belonging to the affiliated societies; and in any matters connected with the Obligatory Examination it is most important that they should be directly represented on the Council. Secondly, as most of the classes carried on by these societies are modelled more or less directly on our own classes, valuable exchanges of information and advice can be made. In some cases the classes, as is now the case with the Birmingham Association, can make arrangements for interworking. And the repetition of some of our courses of lectures to the provincial societies, and the extension of the use of the loan library, are most important benefits that will be derived from the scheme.

With regard to the work of the Association classes, some slight alterations have been made in the elementary classes of design which were suggested in the class reports, and which it is hoped will improve and increase the benefits, already very great, which are to be derived from these classes.

No alteration will be made in the class of design, the result of the working of last session being considered satisfactory. But during the present session an attempt will be made to improve the working of those classes in which paper work is submitted. Under the present arrangement the visitors to these classes have to deal with some thirty to forty papers, each of which consists of fifteen to twenty pages of foolscap. The mere reading, correcting, and marking of these papers is no slight task, and to attempt to point out to each individual student the errors in his paper at the class meeting, or to question him as to answers which require explanation on his part, as well as to point out to the class specimens of the best answers is almost impossible, and makes the meetings very long and sometimes slightly tedious. Among the fresh facilities for study, it has been found desirable to start this year a class for the study of natural philosophy, which will form an introductory course to the class of graphic statics. The new course of lectures on geology has a very close connection with the science of building, and those students who make their first acquaintance with this most fascinating of all the sciences will find in Mr. Locke an able and lucid exponent, while those who already have some knowledge of the subject will, I venture to think, find it treated from a standpoint from which probably they have not previously regarded it, and both will, I hope and trust, be led to make practical geology one of their constant pursuits, as the opportunities which they as architects have of following up this study are very great. It is to be hoped that the students this session will not neglect their opportunities as they did last year with regard to joining the land-surveying class in sufficient numbers to enable the class to be formed. I would also call the especial attention of the members to the new arrangements for the study of water-colour, which should insure the success of the water-colour class during the vacation, and I will now conclude with a few remarks to those students who are about to work in the classes.

I take it for granted, gentlemen (and I am sure you do yourselves), that you are all greatly gifted and have each and every one a glorious and successful career before you; but of this much I am sure, that the matter is very much in your



own hands. Remember that the very magnitude of your talents implies great responsibilities, that genius is said to be only another word for capacity for hard work, and that it is only those who persevere and work to the end who really show and make good use of the talents they possess.

Year by year our class reports record a falling off in the attendances at the class meetings towards the end of the session. This can only be attributed to one cause, that the students are disappointed in themselves and find that they are not the geniuses they thought they were, or they would endure to the end. But I hope I am not speaking to any such to-night; and if I am, I would still urge those who feel this disappointment to work steadily on, because you may have been mistaken and find that your talents were hidden treasures, only to be found by painful search. In this Association every one is on a perfect equality, and your position in it will be entirely of your own making, and depend on your abilities and personal qualities, without regard to your rank, position, or money.

In working in the classes you cultivate habits of self-denial, unselfishness, self-reliance, and industry, which will make your life work easier, and in the end you will find these habits a very good substitute for genius. The prize can only be gained by one; the benefit of working in the class can be shared by all. By all means strive for the first place, but do not leave off working because you see you have no chance for it.

Cultivate by all possible means the artistic side of the profession, but do not be led into the error of despising the practical and constructive side. If, for instance, you have to leave the writing of your specification to some one else, I am afraid the building will hardly realise your own ideal. No artist was ever spoilt by studying construction, and as facilities are now afforded for you to know the why and wherefore of each formula you use, I would strongly urge you to follow up the study at least so far as to be able to build up some of the simpler formulæ for yourselves.

Take every opportunity the Association affords of making new acquaintances among your fellow-students; they may, and often do, ripen into useful and valuable friendships in after years; but my object in this is for present purposes. One of the most important accomplishments in an architect is to be a good judge of character, and in the Association you have as varied a collection of types as you are likely to meet anywhere.

I said at the commencement that our system of instruction had very definite limits and possibilities. The value of receiving tested and approved information is very great, but at the same time it is necessarily condensed and brief. Do not therefore think, when you have listened to all the lectures and passed through all the classes, that your salad days are ended, and in the ripeness of your powers you are equal to any emergency. The lectures and classes are at best only hints and outlines that you must fill in for yourselves.

In London the opportunities for doing this are without rival anywhere, and full particulars where these are to be found are set out at the end of the Brown Book. The classes are only intended to whet your appetite for more direct and scientific knowledge.

A vote of thanks, moved and put to the meeting by Mr. Aston Webb, having been seconded by Mr. John Slater, and supported by Mr. Tarver, Mr. Pink, Mr. Bulmer Booth, and Mr. Cole A. Adams, was unanimously passed to the President for his address.

#### GLASGOW ARCHITECTURAL ASSOCIATION.

AT the second sessional meeting of this Association a lecture was delivered by Professor T. Baldwin Brown, his subject being "The Art of Decoration." Mr. Thomas Gildard occupied the chair. Before proceeding to the business proper of the evening the Chairman referred to the recent death of Mr. Sellars, and the president, Mr. Keppie, moved that an expression of the Association's loss be minuted and a message of condolence forwarded to Mrs. Sellars and family. The motion was seconded by the vice-president, Mr. A. N. Paterson, and unanimously agreed to.

Professor Brown remarked that all true art was of necessity decorative. This was literally the case in Classical and Mediæval times, but, commencing with the Dutch *genre* painters in pictorial art, and with the sculptors of the Italian Renaissance in plastic art, a distinction had arisen between the "artist" (regarded as the painter of subject pictures) and the decorative handicraftsman—a distinction which had gone on increasing to the present day. That this distinction was little felt even in early Renaissance days the lecturer showed by recalling the fact that the greatest artists of that time, Botticelli, Ghirlandajo, Giotto, each kept his *bottega* or shop open to all comers. Returning to the beginnings of decorative art, the lecturer showed that it was really the natural outcome of joy

in life, the escape from gaunt necessity to freedom, or of the desire to do honour to God or hero. The practical accommodation of worshippers was only to the most limited extent the motive power in the designing of Greek temple or thirteenth-century cathedral—the two greatest creations that the decorative arts have given birth to. On the spontaneous and unreasoning sentiment, however, was soon engrafted the definite expression of particular ideas, and decoration became phonetic. This highest quality was very fully considered by the lecturer, who gave an interesting analysis of a notable example of expressive decoration—Michel Angelo's frescoes in the Sistine Chapel. An utter lack of this quality, expressiveness, was noted in most modern work, and an excellent illustration of this was furnished in the great collection of decorative designs forming the Queen's Jubilee presents. Yet these designs were called forth by an occasion which focused the history of the last fifty years and evoked sentiments of loyalty and thankfulness. With a reference to the principles of architecture, the mother art, all embracive, and therefore capable when known and acknowledged of duly regulating the relative values of the other arts, and, in particular, of regulating the decorative arts of to-day, the lecture terminated.

A vote of thanks was cordially awarded Professor Brown.

#### LIVERPOOL ARCHITECTURAL SOCIETY.

THE opening meeting of the forty-first session of this Society will take place on Monday evening, the 29th inst., when an address will be given by Mr. Edmund Kirby, A.R.I.B.A., the president.

Ordinary meetings will be held each month, on Monday evenings, at the Royal Institution. Papers have been promised by Sir James Picton, on "The Various Town Halls of Liverpool" (to be held at the Town Hall), and by Mr. James N. Schoolbred, on "Electricity." "Notes on Impressions of Architecture in the United States" will probably form the subject of another paper. The art congress will be held during the week beginning December 3. Papers in the architectural section will be contributed by well-known architects and others.

Arrangements are being made for holding an examination in Liverpool early next year. Mr. A. Culshaw, A.R.I.B.A., has consented to act as hon. secretary, and a class for preparation will be formed if justified by applications, which need not necessarily be confined to members of the Society.

The recommendation of the Council for federation with the R.I.B.A. is now before the Alliance Committee, and when the new by-laws are approved by the Privy Council, steps will be taken to complete this arrangement.

The Council report an increase in the number of members, the number now being 117, as compared with 108 at the close of last session. This number is made up of 42 Fellows, 32 professional Associates, 22 Associates, 20 students, and one honorary and corresponding member. There have been two resignations, viz., one Fellow and one Associate. The deaths of three members—Mr. Cornelius Sherlock (a Fellow), formerly vice-president; Mr. T. B. Crosse, of Shaw Hill, Chorley (a life member); and Mr. M. H. Bloxam, of Rugby (an honorary member)—are recorded with regret. Fifteen members have been elected, viz., three Fellows, eight professional Associates, three students, and one student from the professional Associate class.

In the class report it is stated that it has been the custom for some past years for the visitors to this class, on presenting their annual report, to express surprise at the want of interest taken by the main body of the students in these classes. The same want of interest still exists, although efforts have been made by individual members of the Society to induce the students to avail themselves of the advantages to be gained from advice in drawing and construction from the older members of the profession. Out of a total number of 20 student members of this Society, only seven have sent in designs, and four of these came from one office, that of our worthy President.

#### MANCHESTER ARCHITECTURAL ASSOCIATION.

THE session of this Association was opened on Tuesday evening by a conversation. Mr. A. H. Davies-Colley, A.R.I.B.A., the president, will deliver an address on November 6. Among the papers to be read during the session are the following:—"House Heating Water Fittings" and "House Cold Water Supply Fittings," by Mr. J. Corbett; "Treatment and Manipulation of Metal in Art Metalwork," by Mr. A. Standing; "Commission," by Mr. L. Booth; and also papers by Mr. J. A. Gotch and Mr. H. B. Bare.

In the annual report the committee, in reviewing the past



session, say they have again to congratulate the Association on the continuous increase of its ordinary membership, one honorary member and fourteen ordinary members having entered the Association; but they have to lament the death of an honorary member—Mr. T. Haselden, of Bolton, who had just joined. Two other honorary members have resigned, so that there is a decrease of two in this class, but in the ordinary members' roll there is a net increase of ten after allowing for removals, &c. The numbers now stand—honorary members, nine; ordinary members, sixty-four.

There were only three competitors in the Class of Design, and one in the Class of Construction. The committee feel disappointed at the year's work, but hope to see more energy and interest shown during the coming session, considering the great advantages the classes must offer to all students preparing for the Institute examinations.

Mr. John Ely, architect, Brazennose Street, in his report on the work, said:—

"I think that the competitors might benefit by the suggestion that if they do not study freehand drawing at a School of Art, they should lose no time in commencing to do so. In the drawings submitted there is evidence of the need of attention to this point."

Shortly before the commencement of the session a preparation class was formed for the examination in architecture of the Royal Institute of British Architects. The success of the class was such that of the six Manchester candidates in the examination, five were members of the class, and four passed. The committee were gratified by receiving the thanks of the Council of the R.I.B.A. for the excellent step taken in forming the class; and it was further stated that the Council had thereby been encouraged to hold the examination in Manchester. The committee suggest that the claims of Manchester to an annual local examination are worthy of the attention and consideration of the Council of the R.I.B.A.

In connection with the conversazione the work of members was exhibited in a collection of drawings and models. Examples of decorative art and furniture were also exhibited, and several local firms sent specimens of building materials. The Architectural Association also sent from London some well worked-out designs and sketches. In the course of the evening Mr. A. H. Colley, the president, delivered a short address explanatory of the work and objects of the Association. He congratulated the members upon the successful condition of the Association and the continuous increase in membership. The work, he thought, was exercising a good influence upon the architectural progress of the profession, and he anticipated the best results from it.

#### THE ROYAL SCOTTISH ACADEMY.

THE prizes won in the life school of the Royal Scottish Academy were presented to the successful students by Sir W. Fettes Douglas, president R.S.A., on Friday.

The President, in his address, said one of the best signs was that their school was so well and so conscientiously attended. The Council were exceedingly well satisfied with the whole of the drawings and studies. They had, however, some remarks to make which they hoped the students would take into their consideration. There was a school, a class or a clique, or whatever they might call it, who were studying blackness rather too much. Blackness and strength were by no means alike. In fact, blackness was a means of covering weakness in drawing and many other weaknesses: and the Council would be very glad indeed to see that the "black school" would give up its extreme devotion to its blackness. A little more taste and tact in the arrangement and in the touching in of the background would be a very great matter. There was not much background in a life school study, but the little there was might be done with consideration and taste. It was in knowing when a background should be soft or hard, and when to dispense with it altogether, that the true taste of the artist could be seen.

The Council would wish also to see a little more delicacy and clearness in the works not only of the "black school," but in those of the "delicate school," which was much more satisfactory to the Council's feelings. The black school seemed to be rather in the ascendant, and it really must be kept down—that was the short and the long of it. The Council had never interfered until this year, but they meant to put down their foot in this matter, and insist on having the black-and-white drawings more delicately and more thoroughly executed—in short, with less appearance of labour and with more true labour. He thought that the Council were better pleased with the studies in oil than with those in black and white. But he was not quite sure about that, for they were very pleased with both. In oil, the most thorough study in every respect was that to which they had given the prize. Mr. Marshall Brown studied very satisfactorily in almost every respect, and it was because of the thoroughness of his study that the prize had been given

to it. The young students had 'a great deal to learn in art; and he, perhaps, could not do better than tell them an old anecdote of what the three nationalities did when in want of food. The Englishman slept over it, the Irishman waked, and the Scot "gangs till he gets it." They had all a good deal to do in art, and he advised them to "gang till they got it." What he had said was very much the Council's view of the matter.

What he was now going to say was a very few words on art, and they were his own for good or for evil. In choosing the department of art they would permanently follow they would probably flounder about a good deal ere they settled into their several grooves; and this settlement would almost certainly be as much the outcome of their common sense, or the absence of it, as of their art power. He dared say very many men in every walk in life drifted into grooves they did not fit, and among the students who left their classes with a nearly equal amount of manipulative power those were to be congratulated who, through force of circumstances or mother-wit, quickly found themselves upon the course on which they were best fitted to run. The young artist who had lived in and mixed much in the lower stratum of society—perhaps been born in that stratum—when he became an accomplished manipulist sometimes thought that he took up a higher position in art if he painted society pictures than if he painted those who were not in society; but he would almost certainly fail, whatever his technical ability as an artist might be, for artistic power had no necessary connection with essential truth of character. On the other hand, if the young artist had been reared in nurseries, coddled by nurses, and trained by tutors, all carefully chosen as speaking fine English, he should stick to his natural platform and paint drawing-room scenes and other so-called society subjects. If he took to cottage scenes and low life, as he possibly might feel inclined to do—because of their, to him, unfamiliarity—he too would fail, and his cottage children, however exquisitely painted, would be absolutely without that essential fundamental character of truth which was the foundation of all that was most valuable in art. In saying this he wished to point out that the young artist, in choosing his walk in art, had much more than his brush power to consider. He must study his own idiosyncrasy—what his early life had been, and even what his parents had been. For the case might be summed up in one sentence. He who had been born a gentleman would never do justice in art to the gutter-blood, and yet more difficult would it be for the native-born gutter-blood to do justice to a gentleman. Thus, the most valuable knowledge the young artist could acquire was the knowledge of what he could and—more vital yet—could not do. Much of the non-fruit in after life of brilliant promise in youth was due to ignorance of, or an overweening confidence in, themselves. No man came into the world absolutely plastic, to be modelled into any chosen shape by himself or the world. He was handicapped from birth by transmitted ancestral tastes and tendencies, which he could not too anxiously study, and upon his judgment would depend his success in life. When he was a young artist, fifty years ago, the aspirant for a place on the Exhibition walls generally strove to take up very high ground indeed. He chose his subject from the sublimest parts of sacred and profane history, without considering for an instant whether the volume or characteristics of his mind or his educational training fitted him for his theme. Sometimes he condescended to the simpler scenes in Scripture, such as "St. John in the Wilderness," and generally was more successful with the skins in which the Baptist was clothed, than with the expression of the message he conveyed. But, after a time, common-sense and probably the claims of a dissatisfied stomach—for he never sold these pictures—led him to look out for, and paint, subjects more suited to his natural tastes and powers. Swift's anathemas on intending poets might well have been quoted to him:—

What reason can there be assign'd  
For this perverseness in the mind?  
Brutes find out where their talents lie:  
A bear will not attempt to fly;  
A founder'd horse will oft debate  
Before he tries a five-barr'd gate:  
But man we find the only creature  
Who, led by folly, combats nature;  
Who, when she loudly cries Forbear,  
With obstinacy fixes there,  
And where his genius least inclines  
Absurdly bends his whole designs.

They, the young artists of the present day, showed more common sense in the selection of what they desired to paint. They seldom chose a theme beyond their powers: but they were painfully modest, and never allowed the faintest gleam of fancy or imagination to illumine their canvases. What they did do was excellently done. Better painted life studies or water barrels were not anywhere to be found. But why should they not deal with subjects as well as objects? They might



probably justify their unfruitfulness of fancy by alleging the want of materials and models; but let them look around. There were materials everywhere, and models too. If they did not quite suit what they wished to do at the time, let them remember the French proverb—

When we cannot get what we like,  
We must try to like what we can get.

And while painting whatever came to hand, they need not lose sight of their natural and proper subjects. It was too much the tendency with artists, even the most accomplished artists, to look upon paint as the first element of good in a picture, and this was especially the case with young artists. But the painting of a great picture, however exquisite, was really but little more than the scaffolding of the monument. The monument itself depended upon the realisation by the artist of the true character of the people, the times, and the circumstances involved. If he did not grasp and mentally and morally feel these things, he might be said to understand paint, but he did not understand art.

#### KIRKSTALL ABBEY.

A LETTER has been addressed to the *Leeds Mercury* by Mr. G. Hill, the honorary secretary of the committee for the purchase of Kirkstall Abbey, in relation to the representations made to the Leeds Town Council by Mr. E. Wilson.

The following, he writes, are the facts. When it became known some three months ago that the abbey and grounds would shortly be offered for sale by auction, there was a widely-spread desire, indicated through the press and in other ways, that the estate should, if possible, be acquired for the town by private contract before the day of sale. But, so far as can be ascertained, no steps were taken by any one to secure that end. We therefore formed ourselves into a committee, with the sole object, as we explicitly stated in a letter which you kindly inserted in your pages on the 14th ult., "of purchasing the estate, with the view of its being subsequently acquired by the town, or settled under some other disinterested trust, under provisions that would secure the necessary steps being taken to stop the further destruction of the abbey, to provide for its protection and maintenance in the future, and to insure the dedication of the abbey and grounds to the use and enjoyment of the public for ever." The whole of the financial risks attendant upon such purchase we had determined to undertake. Our first step was to see Sir Edwin Gaunt, chairman of the Corporate Property Committee, to whom we made known our object frankly and fully. He congratulated us on our public spirit in taking up the matter, wished us complete success, and expressed his private opinion that the town council would regard our project favourably. At the same time he told us that about four or five years ago Mr. Edmund Wilson had brought before the Corporate Property Committee the desirability of Kirkstall Abbey and grounds being purchased for the town, and that Mr. Wilson had had some correspondence with the then agent to the trustees. Sir Edwin added that he believed Mr. Wilson had done nothing in the matter for two years or so, but suggested to us that it would be an act of courtesy to see Mr. Wilson before making any offer.

We therefore waited upon Mr. Wilson, ascertained from him that his negotiations had come to naught, and that nothing had been done by him for about two years. We laid before Mr. Wilson our whole project, and said we intended to offer for the abbey and grounds a sum not exceeding 5,000*l.* He expressed surprise on the mention of that amount, and, after being twice pressed to give his own notion of their value, named a sum much in excess of ours, or of what, under any circumstances, we should have offered, and spoke of forming a syndicate to purchase for the amount he had mentioned. Mr. Wilson then declared his intention to recommence negotiations, and desired us to leave the matter in his hands. We told him that if his object would be identical with ours we should be prepared to leave the matter in his hands, or would be glad if he would join our committee. He, however, gave us no information as to his object, nor did he accept the invitation to join the committee. Nevertheless, at his request, we agreed to stay our operations for a week, upon his undertaking to communicate to us within that time the results of his efforts. At the end of a week we received from Mr. Wilson a letter, dated September 4, wherein he stated that on that day he had had a "satisfactory interview" with the agent; but he made no mention of having done anything to secure the abbey and grounds in the public interest. On September 5 we wrote and delivered to Mr. Wilson a letter stating that his communication was so "completely indefinite," so far as our object was concerned, that we had determined to resume our efforts at once. On the following day we ascertained that Mr. Wilson's interview took place, not on the 4th, as stated in his letter, but on the evening of the 5th—that is, a few hours after the receipt of

our second letter, and that then, although he knew we intended to offer not more than 5,000*l.*, he made an offer of 5,500*l.*

After these experiences it was impossible for us to believe that Mr. Wilson's object was identical with ours. Consequently, and after learning that there was not the least likelihood of the estate being withdrawn from the risks of a sale by auction for less than 6,000*l.*, we offered that sum, subject to conditions that would have secured the preservation of the fabric, and the keeping open of the abbey and grounds for the use and enjoyment of the public, for at least three hundred years. As Mr. Wilson had no special authority to purchase for the town, as his former negotiations came to naught, as he had done nothing during the past two years, and as he bid over our heads, it will be seen that any competition against the public interest came from Mr. Wilson, or from Mr. Wilson and his syndicate, and not from the members of this committee, whom he has gratuitously and unjustly aspersed.

#### REGISTRATION OF ARCHITECTS.

IN the last number to hand of the *Building and Engineering Journal* of Australia and New Zealand we find the following note:—

Architecture is unquestionably one of the learned professions, and it has long been a distinct anomaly that civil engineering, which is really an offshoot from architecture, should receive University recognition, and the right, legitimately, to use the letters C.E., which are valued accordingly, while the parent profession is not officially recognised in any way. The Melbourne architects lately took a step in the direction of sweeping away this injustice, and an influential deputation of the leading architects recently waited on the University Council with a view to get a Chair of Architecture established. If this were accomplished no doubt the granting of a diploma or degree in architecture would follow, and that in time would weed out a number of very undesirable "brethren" who are no great credit to the architect fraternity. But even were such a chair already established, the "weeding-out" process would take a long time, and the present want may be much more quickly satisfied by the provision of a registration bill, which, if properly framed, would be an immense boon to every genuine architect in the colony. This matter again came up before the Institute in the course of an able paper, by Mr. Inskip, on "Architectural Education." His views are to some extent embodied in the proposed measure for the creation of a "General Council of Architectural Education and Registration." The unfortunate and acrimonious differences which have arisen among the architects in England over this question of registration has been happily wanting here, thanks to the strong good sense of the members of the profession, but we confess that we quite fail to see on what possible grounds the London R.I.B.A. oppose a scheme which cannot but do good in greatly raising the status of the profession in every part of the United Kingdom.

#### CHURCH BUILDING AND RESTORATION.

**Bolton.**—The Methodist chapel in Chalfont Street, built by Mr. R. Davies, contractor, Shaw Street, from the designs of Messrs. Lomax & Lomax, of Fold Street, to accommodate 400 persons, has been opened.

**Colinton.**—A small Episcopal church is to be erected in this suburb of Edinburgh. The building as designed by Dr. R. Rowand Anderson will be in late Gothic style. The plans show a small building, the chief architectural adornment of which is a square tower on its south side. Internally the church is divided into a nave, 45 feet long by 20 feet 6 inches in breadth, and a chancel, 20 feet by 14 feet, accommodation being thus provided for about 200 people.

**Norton Cams.**—The parish church, which was the scene of a fire early in the year, has now been reopened after enlargement and improvements carried out by Messrs. Treasures & Son, of Shrewsbury, from the plans and under the supervision of Messrs. Osborn & Reading, architects, of Birmingham, in the late Decorated style. An aisle, transept, organ chamber, and vestry have been added, and a baptistery formed under the west tower, opening into the nave by an archway. The church is built of Hollington stone. The roofs are open-timbered, and covered with dark-red Staffordshire tiles.

**Newcastle-on-Tyne.**—The church in Osborne Road, which has been in course of erection from the designs of Mr. T. R. Spence, of Rathbone Place, London, has been opened. Mr. Gray, of Gosforth, was the general contractor. Mr. John Dodds, assisted by Mr. W. Pringle, acted as clerk of works. The cost of the church, which has been defrayed by Mr. Charles Mitchell, has not been made public.



**Bungay.**—The restoration of the tower of the parish church of St. Cross, near Bungay, has been completed. The work has been executed under the supervision of Mr. E. F. Bisshopp, architect and diocesan surveyor, by Messrs. R. Stone & Son, builders, of St. Cross, with Mr. Perfitt, of Harleston, as mason. The new reredos and altar table, also executed from Mr. Bisshopp's designs, are the gift of the sister of the late rector, and executed by Mr. Godbold, of Harleston.

### NEW BUILDINGS.

**Oldham.**—The Austerlands Store, which has been erected from the designs of Mr. Alexander Banks, of Oldham, has been opened. On the ground floor are grocer's shop, 29 feet 6 inches by 22 feet; flour room, 22 feet by 14 feet; butcher's shop, 14 feet 6 inches by 13 feet, and covered passage. The grocer's shop is fitted up with counters, shelving, sugar-bins, and other adjuncts necessary for the carrying on of an extensive business, while the flour-room is replete with flour and grain bins. The butcher's shop is lined to a height of 7 feet with tiling, finished with a dado, the walls above being lined with pressed bricks. Between the covered passage and grocer's shop are the steps leading to the news-room, which measures 20 feet by 14 feet 6 inches. On the first floor, also, is a large store-room for the storage of flour and grain. In the basement are heating chamber and cellar, the floor above the former being fireproofed. The building externally is faced with local hammer-dressed stone, relief being afforded by ashlar dressings, the roofs being slated with Welsh slates, capped with Ruabon ridge tile. The floors are carried by rolled iron girders, upon which rest wood sleepers, supporting plank flooring, the whole constituting a strong floor capable of sustaining an enormous weight. The contract for the erection of the building was let to Messrs. J. & J. Whitehead, Oldham, the fittings being supplied by Messrs. Collins & Barrett, Lees.

**Blackburn.**—Improvements have lately been carried out at the Blackburn Infirmary, in the course of which special attention has been paid to the children's ward. Mr. Christopher Dixon is the contractor, and Mr. Angelo W. R. Simpson, of Blackburn, the architect.

### GENERAL.

**Mr. Edmund Law** was reappointed County Surveyor at the meeting of the Northamptonshire County Magistrates last week.

**The Late Mr. Owston**, of Goole, formerly chairman of the Humber Steam Shipping Company, has bequeathed 300*l.* for a peal of bells for St. John's Church in that town, provided a like sum is subscribed within two years after his death.

**Mr. E. J. Poynter, R.A.**, has been mentioned as a probable successor of Sir John Gilbert as president of the Royal Water-colour Society.

**Mr. E. Wareham Harry** has accepted the appointment of Surveyor of the Borough of Cambridge, and has resigned a similar appointment in Harrogate.

**Mr. J. H. Burton**, of Ashton-under-Lyne, has been successful in a limited competition for designs for a manse at Knutsford for the Congregational minister.

**Mr. Edgar H. Selby, A.R.I.B.A.**, on Saturday last, the 20th inst., delivered a lecture at Lewisham on "Some of the Northern Cities of Italy." The paper was particularly interesting, being illustrated by numerous original drawings.

**Rev. Brooke Lambert**, vicar of Greenwich, on Monday evening distributed the prizes to the students of the science and art classes at Tamworth. In the course of his address he compared the architecture of the present time with past ages. Present day architecture was, he said, merely copies of that of the Greeks. English architecture he described as being without beauty. The only building he knew of in England of real architectural beauty was the Houses of Parliament, and that was not absolutely perfect.

**It is Proposed** to rebuild the Brunswick Chapel at Whitby, at a cost of 4,000*l.*

**Reyton Church, Oldham**, is to be rebuilt at an estimated outlay of 5,513*l.* The new church is to contain 730 sittings.

**At the Glasgow Exhibition** the gate-money up to Saturday last amounted to 193,312*l.* 14*s.*, the total of admissions since the opening day being 4,929,788.

**The Eye Infirmary** which has been erected at Wolverhampton, at a cost of 8,000*l.*, was opened by Lord Dartmouth on Tuesday.

**A Silver Casket** with an address is to be presented to Mr. Thomson Paton, in recognition of his gift of a town hall and library to the burgh of Alloa.

**Preliminary Plans** for the Kendray Fever Hospital, proposed to be built by Mrs. Lambert of Barnsley, prepared by Messrs. Morley & Woodhouse, architects, were on Tuesday sanctioned by the Barnsley Local Board, and finished plans will be proceeded with.

**An Anonymous Donor** has offered to give 5,000*l.* for the building of a free library at Brechin.

**A Theatre** is proposed to be built on the site of the Temple Club.

**The Death**, at the age of thirty-one, is announced of Mr. Donald Mitchell, at San Francisco, on Monday. He left Pitlochry—nearly all the villas and buildings erected there and in the town and district within the last ten years were designed by him—to practise in California about a year ago.

**The Marble Statue** of the late Lord Iddesleigh, by Mr. Boehm, R.A., will be unveiled by Lord Cranbrook in the centre hall of the Houses of Parliament on the morning of November 6.

**The Architects and Surveyors' Assistants** in Melbourne have decided to establish a society under the title of "The Architectural and Engineering Association."

**At Ross Cathedral**, Fortrose, the north wall, it is said, is in danger of falling, and the authorities, who have taken charge of it as an ancient monument, have as yet taken no remedial steps, though the matter has been repeatedly reported to them.

**The Gloucester Town Council**, on Tuesday, adopted a resolution expressing regret at the death of Mr. Gambier Parry. A letter received from the bishop and the cathedral authorities was also read, stating the steps which were being taken to raise a memorial to Mr. Parry, and asking the co-operation of the Corporation.

**The Ancient Church of St. Mary's-in-the-Castle**, Dover, is being thoroughly restored and renovated by the Ecclesiastical Commissioners.

**The Institution of Civil Engineers.**—There are now on the books of this Society 1,614 members, 2,499 associate members, 458 associates, 19 honorary members, and 939 students, together 5,529, being an increase at the rate of 3½ per cent. during the past twelve months.

**The Lease** of the Theatre Royal in Manchester is drawing to a close, and a scheme is in contemplation to build a new theatre of most elaborate design in the immediate vicinity.

**A Proposal**, which it is asserted is likely to take practical shape, has been made for providing close to Westminster Abbey a "Campo Santo" for the sepulchres and memorials of departed worthies.

**A Meeting** of manufacturers and employers of labour in Dublin is to be convened to ascertain to what extent a guarantee fund would be anticipated, and to discuss the prospects of successfully holding an international exhibition in Dublin next year.

**The Death** is announced of Mr. E. W. Wright, at the age of sixty-four, who has practised as an architect at Adelaide, New South Wales, since 1848. He designed the town hall, the post-office, several of the banks, and other institutions, was President of the Association of Architects, and had been Mayor of Adelaide.

**A Conversazione** and sale of Christmas cards and sketches by present and past students of the Royal Female School of Art, Bloomsbury, will be held on Monday evening next. The proceeds will be devoted to the building fund for the new studio.

**The Parish Church** of Norton Canes, near Cannock (which was destroyed by fire some time back) has been restored from the designs of Messrs. Osborn & Reading, of Birmingham, and reopened on Monday, October 22. The reredos, pulpit, font, lighting apparatus, and the whole of the church furniture were supplied by Jones & Willis, of Birmingham and London.

**At the Italian Exhibition** in London the pictures and sculpture and other objects of interest in the main building and fine-art annexes are most numerous, numbering nearly one thousand five hundred exhibits, and their inspection fills up a large part of a day's holiday. The Roman Forum, Borghese Gardens, and Capri Grotto all invite attention, whilst the show in the Roman Coliseum forms one of the chief attractions of an afternoon and evening. The grand march past, at the conclusion of the sports, of the Vestal Guards, Roman Guards, Etruscan Guards, Imperial Guards, lictors, senators, consuls, priests, &c., embraces 500 performers.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, OCTOBER 26, 1888.

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*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

### TENDERS ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

### NOTICE TO THE PUBLIC.

By the Post Office arrangements THE ARCHITECT can now be sent to any part of the United Kingdom by an affixed Halfpenny stamp; hitherto the postage has very frequently been twopence per copy. The Publishers will be happy to forward, for 20s. per annum, post paid, THE ARCHITECT, to residents in towns and neighbourhoods to which there is no easy access by railway. Terms for the half-year, 10s.

Our readers are invited to address us on subjects of interest to themselves or the public. We shall be always ready to insert letters asking for a solution of any suitable questions to a professional or practical nature, and to receive replies of such inquiries.

### CONTRACTS OPEN.

BISHOP'S CASTLE.—Oct. 27.—For Construction of Water-works in the Borough. Mr. Aaron Hamar, Borough Surveyor, Bishop's Castle.

BRADFORD.—Nov. 5.—For Completion of Six Houses, Horton Road. Mr. Samuel Jackson, Architect, 33 Kirkgate, Bradford.

BRADFORD.—Nov. 3.—For Building Weaving Shed, Westbrook Mills. Mr. John Drake, Architect, Winterbank, Queensbury.

CAMBERWELL.—Oct. 31.—For Extension of Infirmary, Havil Street, for the Guardians. Mr. R. P. Whellock, Architect, 45 Finsbury Pavement, E.C.

CARDIFF.—Oct. 29.—For Erection of Banking Premises and Office Buildings, St. Mary Street. Messrs. Jacobs & Pickwell, 65 St. Mary Street, Cardiff.

CORK.—Oct. 29.—For Enlarging Lea View House. Mr. W. H. Hill, Architect, 15 Marlborough Street, Cork.

DEVONPORT.—Oct. 29.—For Building Board School. Mr. J. P. Goldsmith, School Board Offices, Ker Street, Devonport.

FOREST HILL.—For Completing Four Houses, Colfe Road. Mr. W. Beecroft, 14 Billingsgate Market, E.C.

HASWELL.—Oct. 27.—For Building Manager's House and Shop. Mr. H. Hind, Secretary, Co-operative Provision Society, Haswell.

KENSAL TOWN.—Nov. 9.—For Building Public Library. Messrs. Harslake & Mortimer, Architects, 5 Great Queen Street, Westminster.

LAVENDER HILL.—Nov. 1.—For Building Central Library. Mr. E. W. Mountford, Architect, 22 Buckingham Street, Strand.

LEEDS.—Oct. 29.—For Enlarging Board School. Mr. Lee Clerk to the Board.

MORTLAKE.—Oct. 30.—For Building Hospital and Mortuary adjoining Cemetery. Mr. Alfred J. Wood, 17 The Green, Richmond, Surrey.

MOUNTAIN ASH.—Oct. 29.—For Adding Vestry, &c., to Chapel. Rev. T. Anthony, Gordon Villa, Mountain Ash.

RASTRICK.—Oct. 31.—For Building Chimney (45 yards), Badger Hill Mills. Mr. R. F. Rogerson, Architect, 11 Church Street, Brighouse.

SMALLBRIDGE.—For Building Premises. Mr. T. Butterworth, Architect, Miraflores Terrace, Littleborough.

SOUTHAMPTON.—Nov. 12.—For Partial Reconstruction and Reseating of Above Bar Congregational Church. Mr. W. H. Mitchell, Architect, 8 Portland Street, Southampton.

SOWERBY BRIDGE.—Oct. 27.—For Pulling Down Scar Head Mill and Building Eight Houses. Mr. S. Wilkinson, Architect, Sowerby Bridge.

STOKE-ON-TRENT.—Oct. 29.—For Alterations and Additions to Penkull Schools. Messrs. Scrivener & Sons, Architects, Howard Place, Hanley.

WIDNES.—Oct. 31.—For Erection of Strong-room at Town Hall. Messrs. F. & G. Holme, Architects, Crosshall Street, Liverpool.

WORCESTER.—Oct. 31.—For Making Sewers and Works in connection. The City Surveyor, Guildhall, Worcester.



## TENDERS.

## BARNESLEY.

For Street Improvement Works. Mr. J. H. TAYLOR, Borough Surveyor, Barnsley.

## Tower Street.

W. Walker . . . . .	£484	5	0
H. Hinchliffe . . . . .	375	0	0
A. Moore . . . . .	364	3	0
J. & T. Taylor . . . . .	361	0	0
Porter & Higham . . . . .	355	14	8
E. R. Taylor . . . . .	355	0	0
J. Cooper . . . . .	346	0	0
H. BURROWS (accepted) . . . . .	338	4	6

## St. John's Road.

W. Walker . . . . .	412	0	0
H. Hinchliffe . . . . .	350	0	0
A. Moore . . . . .	338	8	0
J. & T. Taylor . . . . .	334	10	0
E. R. Taylor . . . . .	329	0	0
Porter & Higham . . . . .	328	18	6
H. Burrows . . . . .	321	6	0
J. COOPER (accepted) . . . . .	319	19	0

## BOURNEMOUTH.

For Wrought-iron Unclimbable Fencing (260 yards), with Gates, &amp;c. Mr. G. R. ANDREWS, Surveyor, Bournemouth.

E. Howell, Poole . . . . .	£88	0	0
W. G. Tuck, Winton . . . . .	85	16	0
Brownlie & Murray, Glasgow . . . . .	73	15	0
G. B. SMITH & Co., Glasgow (accepted) . . . . .	69	3	4

## BRADFORD.

For Building Shops and Business Premises, New Kirkgate, Bradford. Messrs. EMPSALL &amp; CLARKSON, Architects, 55 Tyrrel Street, Bradford.

## Accepted Tenders.

T. Egan, excavator.  
P. Drake, mason.  
Taylor & Parsons, ironfounder.  
G. Demain & Sons, carpenter.  
S. Ullathorne, plumber.  
F. Billington, plasterer.  
Hill & Nelson, slater.  
S. Lupton, painter.

## CATERHAM.

For Additions to Tupwood Lodge, Caterham Valley, Surrey. Mr. ALFRED CONDER, F.R.I.B.A., Architect, Palace Chambers, Westminster. Quantities by Mr. William Dunk, 36 and 37 Leadenhall Street, E.C.

G. S. S. Williams & Son . . . . .	£4,590	0	0
S. J. Jerrard . . . . .	4,469	0	0
James Morter . . . . .	4,373	0	0
Colls & Son . . . . .	4,333	0	0
E. Lawrance & Son . . . . .	4,141	0	0
James Holloway . . . . .	4,140	0	0
J. Woodward . . . . .	4,070	0	0
T. Rider & Son . . . . .	3,998	0	0
J. & J. GREENWOOD (accepted) . . . . .	3,777	0	0

## DARTFORD.

For Building Warehouse, Bullace Lane, Dartford, for the Wardens of St. Saviour's Parish, Southwark.

Gumbrill, Dartford . . . . .	£740	0	0
Knight, Sidcup . . . . .	601	0	0
A. C. Rayner, Gravesend . . . . .	587	0	0
Stone & Humphries, London . . . . .	575	0	0

## DOUGLAS.

For Building Prison near Douglas, Isle of Man.

T. Kewish, Douglas . . . . .	£5,434	0	0
M. Carine, Douglas . . . . .	4,980	0	0
KELLY & PRESTON, Douglas (accepted) . . . . .	4,350	0	0
Bleakley & Son, Liverpool . . . . .	4,350	0	0
Hughes & Stirling, Liverpool . . . . .	4,197	0	0

## HEREFORD.

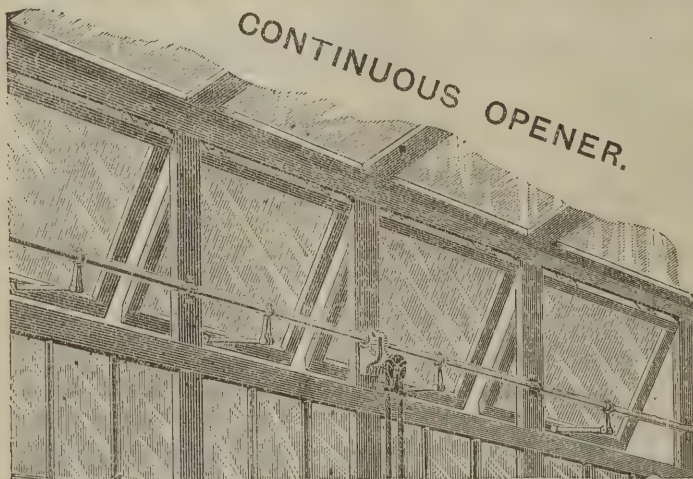
For Erection of Victoria Jubilee Memorial Eye and Ear Hospital. Mr. E. H. LINGEN BARKER, Architect.

Treasure & Son, Shrewsbury . . . . .	£2,198	10	0
Yates, Shifnal . . . . .	2,085	0	0
Kimberley, Banbury . . . . .	2,034	0	0
Dowland, Ponthilas . . . . .	2,020	0	0
STEPHENS, BASTOW & Co., Bristol (accepted) . . . . .	2,000	0	0
Kingerlee, Oxford . . . . .	1,987	0	0
Williams, Knighton . . . . .	1,968	6	0
D. C. Jones & Co., Gloucester . . . . .	1,840	0	0
Watkins, Hereford . . . . .	1,776	0	0
Davies, Shrewsbury . . . . .	1,595	0	0

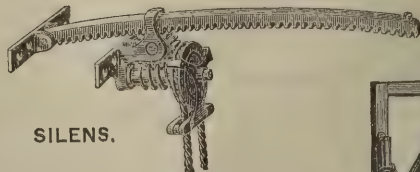
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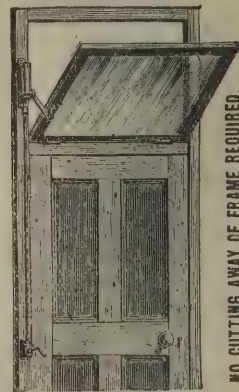
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R. DAVIES Architect.

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For Building Six Houses, Brudenell Road, Headingley. Messrs.  
SWALE & MITCHELL, Architects.  
R. Kirby, St. Peter's Square, brick, stone, and concreting.  
Charles Hague, Bagby Fields, joiner.  
Joe Lindley, Great Wilson Street, plumber.  
James McCluskey, Wellington Road, plasterer.  
R. Pycock, Canal Wharf, slater.  
John Robinson, Kirkgate, painter.  
Alfred Dougill, Great Georges Street, whitesmith.  
All of Leeds.

Heating Apparatus, Low-pressure, St. John's Church, New-  
town. Messrs. SWALE & MITCHELL, Architects.  
James Nelson & Sons, Briggate, Leeds.

LONDON.

For Building Mortuary and Coroner's Court at the Cemetery,  
Munster Road, Fulham. Mr. JAMES S. NORRINGTON,  
Architect. Quantities by Mr. F. H. A. Hardcastle.  
M. Bax, Montgrove Road, W. . . . . £2,749 19 1  
T. Smith, Putney . . . . . 2,100 0 0  
T. T. Chinchin, Kensal Green . . . . . 1,990 0 0  
D. Ellwood & Son, Sandy, Beds . . . . . 1,888 0 0  
T. Linfield, Colls Road, S.E. . . . . 1,832 0 0  
F. Tarrant, Camberwell . . . . . 1,822 0 0  
N. Feltham, Chelsea . . . . . 1,694 0 0  
A. H. Harris, Sutton . . . . . 1,670 0 0  
Scharien & Co., South Kensington . . . . . 1,574 0 0  
J. Munday, Wimbledon . . . . . 1,568 0 0  
T. Martin, Maidenhead . . . . . 1,545 0 0  
W. G. Coat, Hammersmith . . . . . 1,524 0 0  
King Bros. & Co., South Norwood . . . . . 1,470 0 0  
Leslie & Co., Kensington . . . . . 1,436 0 0  
W. H. Ashfold & Co., Fulham . . . . . 1,380 0 0  
Rose & Co., Fulham . . . . . 1,349 0 0  
A. R. Flew & Co., Fulham . . . . . 1,331 0 0  
Caplen & Redgrave, Croydon . . . . . 1,314 0 0  
T. Nye, Ealing . . . . . 1,297 0 0  
A. Brickell, Fulham . . . . . 1,259 0 0  
R. Cox, Battersea . . . . . 1,193 0 0

No tender accepted.

LONDON—continued.

For Erection of Stables, Harness-room, &c., at Dust Destructor  
Depôt, Culvert Road, for the Parish of Battersea. Mr.  
J. T. PILDITCH, Surveyor.

C. Beach . . . . .	£3,045	2	5
Whitbread . . . . .	2,895	0	0
Holloway Bros. . . . .	2,785	0	0
Higgs . . . . .	2,766	0	0
Grist . . . . .	2,758	0	0
Nightingale . . . . .	2,754	0	0
Haylock . . . . .	2,713	0	0
Parker . . . . .	2,699	0	0
J. Holloway . . . . .	2,685	0	0
Sharien . . . . .	2,662	2	5
Howard . . . . .	2,630	10	0
Street & Son . . . . .	2,609	10	0
Marsland . . . . .	2,584	0	0
Richardson . . . . .	2,534	0	0
Bricknell . . . . .	2,519	0	0

For Completing Nos. 79, 83, and 89 Brondesbury Villas,  
Kilburn, N.W., under the superintendence of Mr. WM.  
EVE, F.S.I., 10 Union Court, Old Broad Street, E.C.

	No. 79.	No. 83.	No. 89.
Spencer & Co. . . . .	£613	£613	£613
Scharien & Co. . . . .	578	578	573
G. Godson . . . . .	550	550	550
G. Payne . . . . .	525	528	535
J. Munday . . . . .	520	520	520
H. W. Sarll . . . . .	515	515	515
E. Good . . . . .	490	490	490
G. A. Rowley . . . . .	470	470	470
W. Tout . . . . .	460	460	460
H. W. Dunmore . . . . .	455	455	455
R. Cox . . . . .	445	445	445
J. Fordham . . . . .	430	430	430
C. J. Bursill . . . . .	396	396	396
F. J. Wickes . . . . .	393	393	393
J. Tillbrook . . . . .	365	375	380
G. FLAXMAN (accepted) . . . . .	365	365	365
Woodhouse . . . . .	355	355	355

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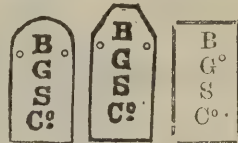


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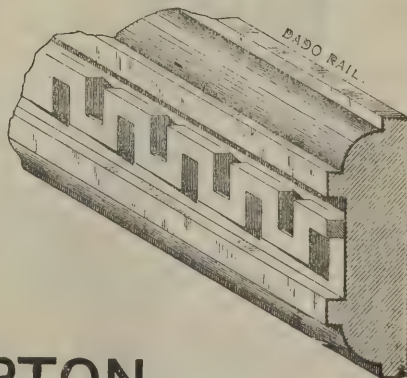
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## LONDON—continued.

For Shop Fittings at the Albion Bakery, No. 354 High Road, Kilburn, N.W., for Mr. E. P. Joyce. Mr. W. A. BURR, M.S.A., Architect, 65 Chancery Lane, W.C.

Drew & Cadman . . . . . £84 0 0  
Stevens Bros. . . . . 84 0 0  
LARKE & SON (accepted) . . . . . 79 0 0

For Erection of Three Shops, Stabling, &c., on Rose Cottage Green, Wanstead, for Mr. J. Maughfling. Mr. W. SEEKHAM WITHERINGTON, F.R.I.B.A., Architect, 79 Mark Lane, E.C.

JOLLIFFE, Wanstead (accepted) . . . . . £1,575 0 0

For Decorative and Sanitary Work at 37 Randolph Crescent, Maida Vale. Mr. DELISSA JOSEPH, Architect, 17 and 18 Basinghall Street, E.C.

A. W. Hammond . . . . . £453 0 0  
G. H. Bird . . . . . 371 5 0  
J. Martin . . . . . 313 17 6  
J. Allen & Sons . . . . . 290 0 0

For Rebuilding of Nos. 37 and 38 Gutter Lane, Cheapside. Mr. DELISSA JOSEPH, Architect, 17 and 18 Basinghall Street, E.C.

## Ironwork.

M. Shaw & Co. . . . . £344 10 0  
Moreland & Son . . . . . 336 0 0  
Measures Bros. & Co. . . . . 302 9 6

## Stonework

G. Seale . . . . . 295 0 0  
G. Herridge . . . . . 290 0 0  
J. Stowell . . . . . 280 0 0

For Rebuilding No. 39 Aldermanbury. Mr. DELISSA JOSEPH, Architect, 17 and 18 Basinghall Street, E.C.

## Ironwork.

Rownson, Drew & Co. . . . . £68 10 0  
C. Williams & Co. . . . . 58 12 6  
Measures Bros. & Co. . . . . 57 9 4

## Stonework.

G. Seale . . . . . 88 0 0  
G. Herridge . . . . . 82 0 0

## LONDON—continued.

For Building Fire Brigade Station, East Street, Marylebone, for the Metropolitan Board of Works.

F. J. Chinchin, Harrow Road . . . . . £18,141 0 0  
Martin, Wells & Co., Lambeth . . . . . 18,000 0 0  
Wall Bros., Kentish Town . . . . . 16,498 0 0  
Ward, Clarke & Co., Old Kent Road . . . . . 15,734 0 0  
J. Holloway, Lavender Hill . . . . . 15,200 0 0  
H. Knight, Morden . . . . . 14,940 0 0  
Staines & Son, Great Eastern Street . . . . . 14,790 0 0  
W. L. Kellaway, Pentonville . . . . . 14,769 0 0  
Kirk & Randall, Woolwich . . . . . 14,609 0 0  
Oldrey & Son, Westbourne Park . . . . . 14,580 0 0  
Stephenson, Bishopsgate . . . . . 14,488 0 0  
Brass & Co., Old Street . . . . . 14,444 0 0  
J. & J. Greenwood, Bermondsey . . . . . 14,359 0 0  
J. F. Chappell, Pimlico . . . . . 14,277 0 0  
STIMPSON & CO., Brompton (accepted) . . . . . 13,878 0 0

For Completing Nos. 17 and 18 Eade Road, Stoke Newington, N., under the Superintendence of Mr. WILLIAM EVE, F.S.I., 10 Union Court, E.C.

H. L. CLARK, 15 Harringay Grove, Hornsey (accepted) . . . . . £442 0 0

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For the Erection of 142 Cottages on the Green Mount Estate, Harpurhey. Mr. SEANOR, Architect, 15 Cross Street, Manchester.

JACKSON BROS., Bradford, near Manchester (accepted) . . . . . £12,780 0 0

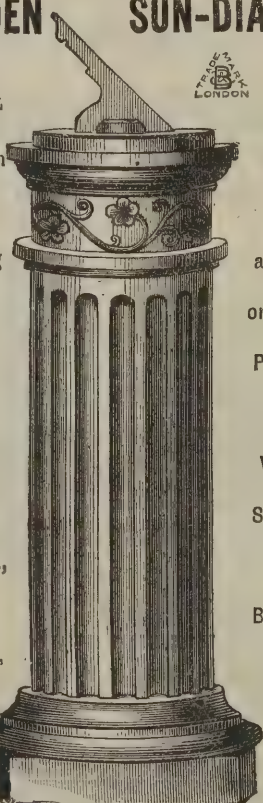
## PETERBOROUGH.

For Building Villa Residence. Mr. M. HALL, Architect, Huntly Grove, Peterborough. Quantities not supplied.

Sharp & Ireson . . . . . £528 0 0  
Binder & Martin . . . . . 516 0 0  
Rowe . . . . . 486 0 0  
Hammond . . . . . 480 0 0  
G. & D. Gray . . . . . 459 0 0  
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Mr. EDWIN PENN, Architect, Stoke-upon-Trent. Quanti-  
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<i>Contract No. 1.</i>			
P. Bennion, Longton . . . . .	£631	0	0
Yoxall & Heath, Stoke . . . . .	558	0	0
N. Barlow, Stoke . . . . .	550	0	0
H. Goodwin, Longton . . . . .	498	15	0
Bradbury Bros., Stoke . . . . .	471	0	0
G. Harris, Stoke . . . . .	460	0	0
T. Chatfield, Hanley . . . . .	450	0	0
G. Hancock, Stoke . . . . .	449	0	0
J. BREEZE, Stoke ( <i>accepted</i> ) . . . . .	430	0	0

**TUNBRIDGE WELLS.**

For Erection of Six Dwelling-houses in Molyneux Park,  
Mount Ephraim, Tunbridge Wells. Mr. WILLIAM B.  
HUGHES, Architect, 43 London Road, Tunbridge Wells.

Charwood Bros.	£10,570	o	c
R. Cox	10,406	o	c
Henley & Co.	9,857	o	c
Holt	9,400	o	c
White & Humphrey	9,377	o	c
Mansfield & Sons	9,250	o	c
G. Stephenson	8,810	o	c
W. J. Wells	8,801	o	c
Strange & Son	8,315	o	c
W. J. Adcock	8,175	o	c
Foster & Dicksee	7,923	o	c
Cornwell & Sons	7,900	o	c
Wallis & Son	7,874	o	c
Beach	7,843	o	c
AVARD ( <i>accepted</i> )	7,479	o	c
Canty	7,457	o	c

## TUNBRIDGE WELLS.

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AVARD (accepted)	7,479	0	0
Canty	7,457	0	0



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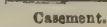
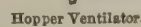
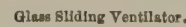
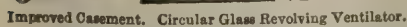
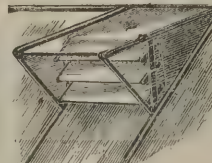
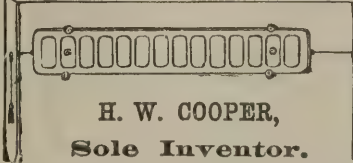
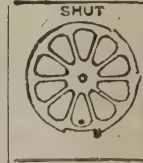
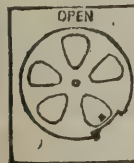
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A WROUGHT-IRON screen, of fine workmanship and design, an elaborately carved altar-table and super altar in oak and ebony, clergy desk and seats, executed from the designs of Mr. Hammond, architect, Circus Place, E.C., has just been completed and fixed at St. Giles's Church, Cripplegate, by Messrs. Jones & Willis, of London and Birmingham.

A LARGE clock and set of carillon machinery have just been erected at the new church, Peel, Isle of Man, by Messrs. John Smith & Sons, Midland Clock Works, Derby. The Cambridge quarters are chimed upon four bells, the hours struck upon the largest bell, and the carillon machine plays seven times upon eight bells, one tune for each day of the week. The clock is of the finest construction in every way, and has been carried out by the makers to the designs of Lord Grimthorpe. It has a double three-legged gravity escapement and compensated pendulum. All the wheels are of gun-metal with the teeth cut from the solid special apparatus as provided to keep the clock going while the weights are wound up, the weights are carried by steel wire ropes. The clock and chimes will doubtless be a great boon to the inhabitants of the

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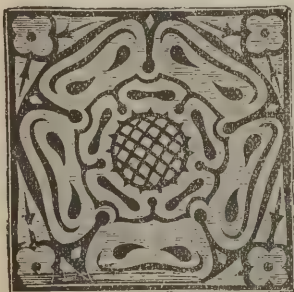
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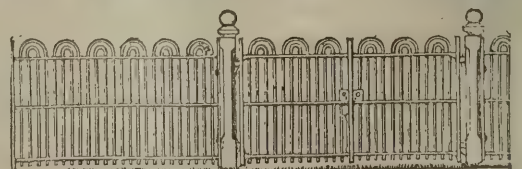
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THE Preston Town Council, on Friday, decided to promote a Parliamentary Bill for powers to borrow money for dredging the Ribble, for plant for completing the dock and works, and for constructing a graving dock.

At the meeting of the Metropolitan Board of Works, on Friday, it was agreed that, after the expiration of Messrs. Mowlem & Co.'s contract for the maintenance of Westminster Bridge, in December next, the roadway of the bridge should be paved with wooden blocks; the engineer instructed to prepare plans and a specification of the work; advertisements issued on November 15 inviting tenders for the same; and the tenders to be opened at the meeting of the Board on December 14.

THE Eastern and Midlands Railway Company are surveying at Spalding for the purpose of constructing a new loop line to connect the line from Lynn to Spalding with the Bourn and Peterborough lines. The scheme, if carried out, would involve a new bridge over the River Welland, and the outlay would be over 30,000*l*.

THE award in an arbitration between the Wakefield Corporation and the Sandal Local Board was published on Monday. The Corporation claimed 39,000*l*. from the Sandal Local Board for the pipes, fittings, and other apparatus connected with the supply of water in the Sandal district, and the Local Board offered 1,010*l*. Mr. Cousens has awarded 1,345*l*., and the cost of the award, 197*l*. 4*s*. 2*d*., is to be paid in equal moieties between the Corporation and the Local Board.

MESSRS. KAYE & SONS, of Leeds and London, have just received instructions to fix their push-and-pull locks on all the doors in the new town-hall at Dewsbury.

CONSIDERABLE additions have been made to the College, Eastbourne, and special attention has been paid to the ventilation, the latest improved form of Messrs. Robert Boyle & Son's patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

THE valuation of Paisley was reported by the town clerks in their return on Monday at 259,259*l*. 11*s*. 7*d*. as compared with 250,505*l*. 15*s*. 4*d*. last year, showing an increase of 8,753*l*. 16*s*. 3*d*.

THE first annual public meeting in connection with the Coventry Technical Institute was held on Tuesday night, at

St. Mary's Hall. Lord Leigh, who presided, remarked that he felt a tinge of regret that the old Coventry Institute, over which he presided forty-one years ago, might now be said to be defunct; but at the same time he most heartily congratulated the citizens on having such a very extensive set of buildings for their new Technical Institute, and upon having taken the lead in this important matter of technical education, upon which this country must largely depend for future successful competition with the other countries of Europe.

A STAGE-PLAY license for the pavilion erected on the pier at Eastbourne has been applied for by the Directors of the Pier Company and refused.

ON Tuesday morning the London and North-Western Railway Company's station at Llandrindod Wells, Radnorshire, was partially destroyed by fire.

ONE of the new kilns of the recently constructed Ogwen Brick and Tile Works, the property of Lord Penrhyn, was fired on Tuesday at Bethesda. Bricks and tiles are to be made from slate rubbish tipped at the famous Penrhyn Quarries, and also from clay dug in the immediate locality. The tiles have been used for the Royal Infirmary, Liverpool, and the Carnarvonshire and Anglesey Infirmary. The development of the new industry has been watched with interest.

ROBERT BOYLE & SON, LIMITED.—The directors of Robert Boyle & Son, Limited, ventilating engineers, London and Glasgow, have resolved, subject to audit, to recommend a dividend of 12 per cent, free of income tax, on the ordinary shares of the company for year ending September last, after placing to reserve fund one-sixth of the profits earned, and carrying forward 1,241*l*. 10*s*. 4*d*.

"HAND ACROSS THE SEA," by Henry Pettitt, will be produced at the Princess's Theatre early in November, and has been strongly cast by Miss Grace Hawthorne. Mr. Henry Neville will play the lead, and will be supported by Messrs. E. W. Garden, W. L. Abingdon, Robert Pateman, Julian Cross, E. Gurney, A. Bucklaw, and H. H. Morrell. Miss Mary Rorke will play the heroine.

"THE STILL ALARM" at the Princess's Theatre will have reached its hundredth night on Friday next, the 26th, and from that date a fire-engine of English manufacture will be used in the famous "Engine-house" scene in place of the American one. Captain Shaw, the chief of the Metropolitan Fire Brigade, has signified his intention of being present on this occasion.

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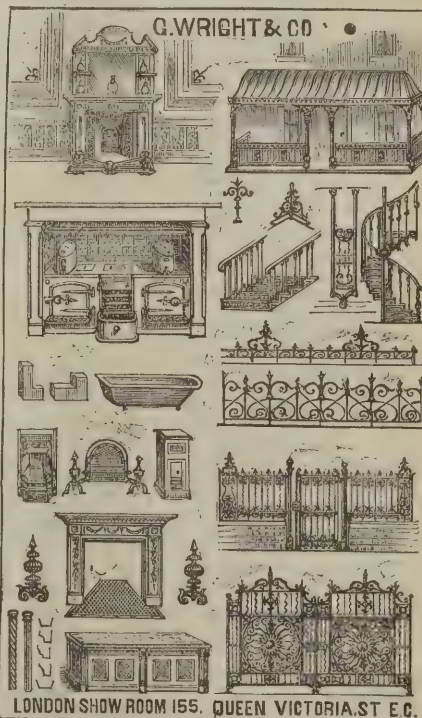
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## THE SALTMARKET DWELLINGS, GLASGOW.

IN the minutes of the Improvement Trust Committee submitted for approval at the last meeting of the Glasgow Town Council, Mr. Carrick reported that the cost of the Saltmarket buildings was 9,723*l.* 13*s.* 9*d.*, the interest on which at 3½ per cent. was 316*l.*, which, being deducted from the gross rental, after writing off 25 per cent. for ordinary charges, left a balance of 354*l.* to the credit of the site, a result which was equivalent to 4*l.* 14*s.* 4*d.* per square yard of ground occupied. This rate converted into a ground annual at 5 per cent., and capitalised at 25 years' purchase, raised the ultimate value of the site to 5*l.* 18*s.* per square yard. With regard to the saleable or commercial value of the property to an ordinary investor in heritage, the *cumulo* value might be moderately stated at sixteen years' purchase of the gross rental of 895*l.* The equitable allocation of the proportion applicable to the ground is the balance which remains after deducting the cost of the buildings (9,724*l.*) from the *cumulo* value of ground and buildings together, which, at sixteen years' purchase, is 14,320*l.* The result is 3*l.* 1*s.* 3*d.* per square yard, which, converted into a ground annual and capitalised in the usual way, would show 3*l.* 16*s.* 6*d.* per square yard; giving for buildings 9,724*l.*, and for ground 5,737*l.*, and these together make up the fair commercial value of the subject. With regard to the erection of further buildings on the east side of the Saltmarket, Mr. Carrick reported that the ground northward from the present buildings was sufficient for five tenements of the same size as those already erected. While the cost need not exceed the outlay for the buildings just completed, the rent of the new buildings should be at least 100*l.* more than the 895*l.* obtained for those already erected. The committee authorised plans to be prepared and estimates obtained for the proposed buildings—Councillor Caldwell dissenting.

Mr. Dunlop, in moving the approval of the minute, explained the circumstances in which the Trust had undertaken the erection of these Saltmarket dwellings, and contended that the success which had attended the undertaking warranted them in proceeding with the erection of this block. They had not the slightest desire to proceed further in the matter of building; but by raising the character of the locality they would do something to attract builders to build up the other side. They had no desire to go into any socialistic scheme. As an investment he held these properties had been a success. If anything more was needed to justify them in continuing the extension of these buildings it was that they

had been visited by the most critical and most prejudiced, and they were all satisfied that nothing that had ever been attempted had been so successful as the construction of these single rooms. He believed that if they finished this block they would have a great demand for the houses. The factor told him that there was a demand for even a higher class of houses, while there would be no difficulty in letting the shops.

The minute was approved of.

## AMERICAN NOTES.

IN the October number of *Stone*, a monthly periodical lately started in Indianapolis, the following note appears on the "Beauty of Indiana Stone":—

Professor John Collett directs attention to the stone front of Fletcher's bank building in this city as evidence of the exceptional merits of Indiana's oolitic stone. It has recently been cleaned with steel brushes, and is now brighter than when the building was first erected. The Indiana State-house is built of the same material, and it is destined to become more beautiful as it grows older, Professor Collett says, until it will finally acquire a polish brighter than marble. If the idea that was in view when it was decided to use the Indiana oolitic stone is carried out the exterior of the building will be cleaned with steel brushes every fifteen years, and with each brushing it will become brighter. Why? Professor Collett says that it is because the stone is almost pure carbonate of lime and its impurity is organic matter—petroleum which is oxidised by exposure to air. The stone not only becomes brighter, but it grows harder and more durable with the lapse of time. It should be borne in mind that this is true of Indiana oolitic stone only.

For many years it has been known that California contained marble of a very superior quality, but until recently it has been almost entirely undeveloped, notwithstanding that this State imported large quantities of Italian marble. The Inyo quarries have recently passed into the hands of energetic business men who are developing their resources. The stone has recently been examined by Mr. William W. Wilkins, of Proctor, Vermont, who pronounces it of a very superior quality, of fine colour, nearly white, and of fine texture. There are other marbles in California of different colours which will in time demand attention.

In describing the resources of the Platte Valley, Wyoming,

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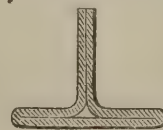
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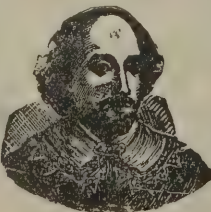


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it is stated that there is probably no section enshrouded by eastern fog or shone on by western sun in which nature has deposited more exhaustless or excellent building materials than the Valley of the Platte. It is all here—sandstone of variety of beauty, ease of access, limitless quantity, and quality unsurpassed; granite of formation wide and deep and unchallenged excellence; timber of hundreds of miles in area and growth, mature and magnificent, and beds of building clay of unexplored depth. He that builds can build as he will; he can fashion a mansion in the Platte Valley with the same ease and the nominal expense attending the building of a cabin in other less favoured localities. The sandstone is in great variety as well as limitless quantity. Red sandstone, green sandstone, and sandstone silver-edged are all found, and are all ready of utilisation. The red sandstone, the same stone which in beauty of tint, ease of workmanship, and durability of texture, has made the Rawlins quarries so famous, is probably the greatest in the Platte Valley deposit. This stone is found chiefly in the near vicinity of the Platte River, usually cropping out of the soil of the first and second upland benches. The ledge in which exists the great red stone quarries of the future and the Platte Valley is situated on the same splendid area of bottoms and uplands within whose limits are the famous Saratoga hot springs. The ledge is apparently limitless in deposit, and is most excellent in character. In its soft, red hue it is lovely, yields readily to the chisel, and after being exposed to the air becomes as hard as chilled steel, opposing a front at once polished and imperishable to the attacks of time and the assaults of wind and weather. Within a few steps of the Saratoga Hot Springs Hotel, and sheltering the numerous outhouses of that building as with a rampart of iron, there rises a bold and jutting cliff of this red stone, its massive and weather-beaten front grimly guarding untold quarry riches. Two miles east of the town of Saratoga there begins an immense deposit of sandstone, green in colour. This peculiar hue is given the stone by general, closely diffused copper stains, the natural colour of the stone being a pure, clear white. In geological formation and character this stone is identical with the world famous silver sandstone of Silver Reef, Idaho.

According to an American writer, the palaces of the merchant princes of Chicago surpass those of the ancient Florentine and Venetian Republic. Never before, says the *Chicago Building Budget*, has been seen in the history of the world the log hut changed in fifty years into a city whose

internal decoration can hardly be equalled, even in the older countries, where such masters of their art as Mr. Street, architect of the 12,000,000 dols. Law Courts, Mr. George Aitchison, M.A., A.R.A., and Mr. John P. Seddon, F.R.I.B.A., do not disdain to personally design interior decorations, tiles, stained-glass windows, colour treatment and general artistic as well as constructional details which they have leisure to accomplish, partly through being able to entrust to pupils portions of the work which architects here are compelled to supervise personally, or to employ skilled and, therefore, high-priced assistants.

#### ST. MICHAEL'S CHURCH TOWER, COVENTRY.

A PAPER, prepared by Mr. W. Andrews, of Coventry, and presented last May to the sub-committee for the restoration of the bells, has just been published. He says:—

All the four professional men who have given opinions upon this matter are unanimous that the bells cannot be replaced and rung in the ancient tower with safety to its fabric. These are Mr. J. O. Scott, Mr. Pearson, Lord Grimthorpe, and Mr. J. Thompson, the contractor. The last of the above is very emphatic on this question, and it is obvious that he has had better opportunities of knowing the state of the steeple than the previous three put together. To the above I may add the opinion of the Rev. Canon Cattley, of Worcester, who is a recognised authority upon bells and bell-towers, and who is well acquainted with St. Michael's steeple. To this I may add that the steeple is a yard or so out of perpendicular, a fact which was unknown to some of the above-mentioned professional gentlemen when they gave their opinion. So far as I know, the views of all the amateurs who have given their attention to St. Michael's steeple coincide exactly with the above professional opinions. It may be pointed out that these amateur opinions are not based upon the professional views; on the contrary, they were formed from independent investigations previous to the professional views becoming known. So far as I can discover, one professional opinion only, that of Mr. Pearson, has been given that the bells might be safely replaced and chimed in the ancient steeple. By chiming I mean of course the method of swinging the bells just sufficiently to make the clapper strike, but without raising the bells. Against this I may set the opinion of the Rev. Canon Cattley, who thinks that chiming would cause much vibration and would

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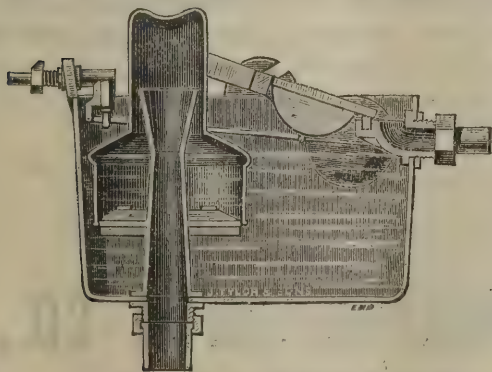
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be risky to the steeple. These views were considered so conclusive that the general restoration committee unanimously adopted on January 13, 1886, and passed a resolution that the restoration of the steeple should be completed strictly according to the contract and specification already entered into. The clearest possible evidence exists that the steeple was never built or intended for either ringing or chiming, but only for bells not to be swung but merely to be struck with hammers or clappers. History mentions that bells were placed in the steeple in the year 1429, viz., before the spire was built, and some writers have given an opinion that the bells were placed in the fourth stage of the tower—that is to say, above the groined vault, and that they were chimed by ropes reaching to the floor of the church a hundred feet below. This, however, is a mistake. Where, then, were the bells placed? An examination of the steeple shows that they were placed in the octagon. The holes in the walls in which the bell-beams were fixed still remain inside the octagon, but no traces of any such holes can be found in the top stage of the tower. This shows that the fourth stage of the tower was for the men who played the bells, whilst the bells themselves were in the octagon above. The bells could not have been swung, or they would have brought the octagon down. Coventry possesses three peals of bells, but at present none of them can be rung, and only one peal can even be chimed. This is from the same cause in all cases, viz., the weakness of the towers. I am old enough to remember the time when the stair turret of the tower of St. John's Church had to be pulled down to prevent it from falling, as it was so badly cracked. It remained down for some years, but has since been rebuilt. The bells here are sounded by ropes tied to the clappers which are banged against the inside of the bells, the bells remaining steady. The peal of Holy Trinity Church is in a similar condition; these bells are also clattered, and the tenor bell has been cracked by this means. It is by no means uncommon for clattered bells to become cracked. My view is that the citizens of Coventry will not be satisfied unless there is one peal of bells in the city which can be rung in full peal, and this should be the best peal, namely, that of St. Michael's. It will therefore be seen that there is only one real solution of this question, namely, to build a new bell-tower and to build it strong enough for its work.

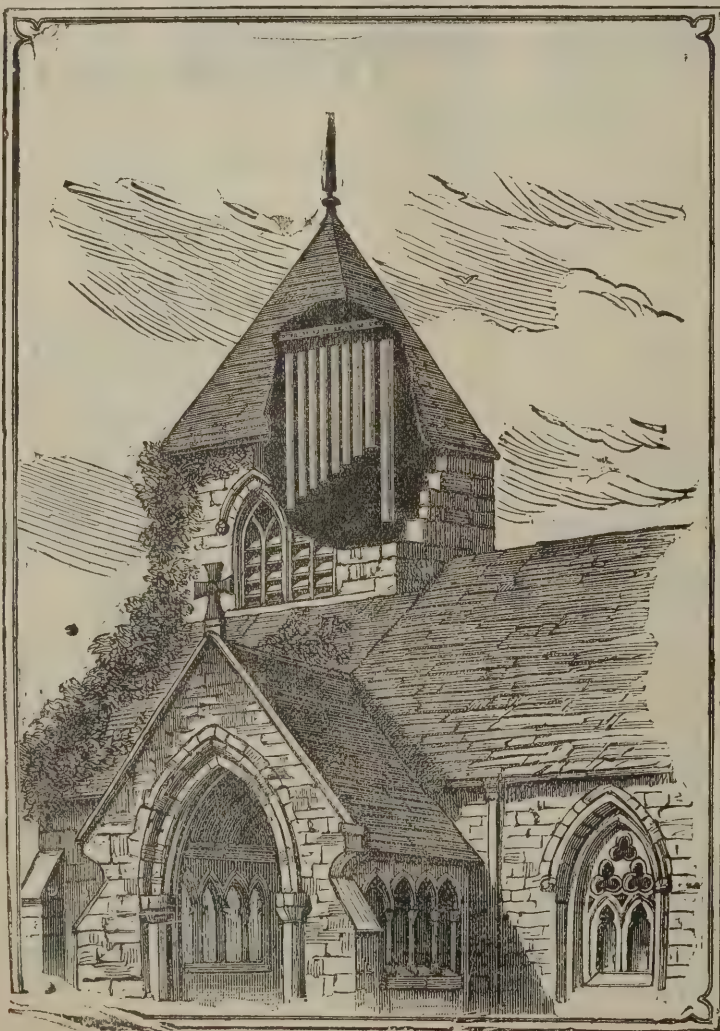
In considering a new bell-tower, the first question to be decided is its site, and whether it should be quite detached from or joined to the church. Some persons imagine that detached towers are very improper and quite unorthodox.

Others think that a new detached tower would in some way or other interfere with the appearance of the old steeples. But the following list which I have compiled of a few of the churches in England and Wales which have detached towers, will show that they are common:—Bedfordshire: Elston, Marston Morteyne, Woburn. Cornwall: Mylor, Gunwalloe. Devon: Chittlehampton. Denbighshire: Henllan. Gloucestershire: Berkeley, Westbury. Glamorganshire: Llangefelach. Herefordshire: Ledbury, Pembridge. Lincolnshire: Fleet, Flixborough. Norfolk: West Walton, East Dereham, Torrington St. Clement, Walton. Northamptonshire: Irthlingborough. Sussex: Chichester. Suffolk: Bramfield, Beccles, Bury St. Edmunds. Warwickshire: Lapworth. Worcestershire: Evesham. There are at least six more in Cornwall, but I do not know their names. I have seen several of these detached towers, and have not noticed anything unsatisfactory in their appearance. The Evesham tower is a very noble one, and stands in the same churchyard with two churches which have steeples. But perhaps the one which may be best compared with Coventry is that of Chichester Cathedral. This cathedral has a steeple nearly 300 feet high, or about the same height as St. Michael's. The bell-tower, 120 feet high, stands in the cathedral yard on the north side. Yet I have not noticed that it interferes in any way with the steeple.

If it should be decided that a new bell-tower should be built entirely and permanently detached from the church, then I am of opinion that it would be best some distance away, and the corner of the churchyard opposite Priory Street seems to be a likely site. I am of opinion that the following dimensions would be suitable for such a tower. Base of tower including buttresses 50 feet square. Side walls about 9 feet thick at base, tapering to 6 feet at top. Height to roof 95 to 105 feet, according to position of tower. Ringing chamber 20 feet square. Clock and chimes chamber of same dimensions. Bell-chamber 21 feet square. Such a tower would weigh between 7,000 or 8,000 tons according to the material with which it was built. Although only one-third of the height of St. Michael's steeple its weight would consequently be much heavier.

#### A MONOPOLY OF PRACTICE.

In the course of a discussion, "Should Architects undertake Engineering, and Engineers Architectural Work?" Mr. F. Harrison, M.V.I.A., of Deniliquin, has written to the



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*Building and Engineering Journal* of Australia and New Zealand. A portion of the letter deals with the question of public buildings. He says:—

For nineteen centuries his name (Vitruvius's) has been a "household word" and his fame without eclipse. He was the light of other days. Now we have the electric light, and, on the shores of a certain lovely harbour, a star that (no matter what its magnitude) puts all other lights in the shade. Permit me to present Mr. James Barnet, F.R.I.B.A., colonial architect of New South Wales; and Vitruvius, my old friend, take a back seat. Your catapults are as shuttle-cocks against the fortifications of Sydney, and you cannot keep up the pace. Rome was right enough till Barnet built New South Wales, but Sydney beats the record. We architects, engineers, and surveyors kept your memory green through nineteen centuries, but each day some teeming brain develops something new, and the total is beyond the capacity of any ordinary cranium. Listen, Vitruvius, and judge for yourself; but though as the centuries roll past on the pages of history another will henceforth eclipse your fame, yet you will not be quite forgotten. Here are a few items of the little bill. Out of the 1,300 public buildings in New South Wales 1,000 are due to the fertile brain of Mr. Barnet. Besides hospitals, asylums, fortifications, and a dozen lighthouses, they include 160 court-houses, 12 gaols, 230 police-stations and lock-ups, 150 post and telegraph offices, designed and built during the leisure the administration of his department affords; time, 26 years; cost, 5½ millions sterling—10,576*l.* 16*s.* annually.

Now, I submit the following suggestion:—Mr. Barnet's prolific brain has been called on to supply a design for some public building once every fortnight for twenty-six years, and though I cannot apply the comment I lately read of a young lady on a flock of sheep, that "they look worthy creatures, but there is a great sameness among them," yet it needs no argument to prove that the little sum represents good work for 100 brains. For the sake of this paltry 10,000*l.* annually (or say 20,000*l.* in the future, for I have not included the State House), would it not be better that the public buildings of the colony should represent fairly the architectural talent of the period, obtained by fair public competition, rather than for a quarter of a century they should represent only the ideas of one individual? Sharing the emoluments is quite a secondary consideration; but, as a question of State policy and public justice, should not the genius of the profession find the means of expression in State buildings, and not be restricted to private enterprise?

In all sincerity and respect I hope that Mr. Barnet will for many long years enjoy the rest he has so well earned. He has faithfully and skilfully performed the duties of a difficult and responsible position for more than a quarter of a century. When old age overtakes us, it is a most grateful and consoling feeling that we have used our talents well; and the colonial architect, when his career is finished, will leave many monuments in New South Wales that will remind future generations of one of her most talented and honourable public servants.

#### GROWTH OF RINGS IN TIMBER.

In a report by the chief of the forestry section of the Agricultural Department of the United States, referring to the annual rings in trees, it is stated that these exist as such in all timber grown in the temperate zone. Their structure is so different in different groups of timber that from their appearance alone the quality of the timber may be judged to some extent. For this purpose the absolute width of the rings, the regularity in width from year to year, and the proportion of spring wood to autumn wood must be taken into account. Spring wood is characterised by less substantial elements, the vessels of thin-walled cells being in greater abundance, while autumn wood is formed of cells with thicker walls which appear darker in colour. In conifers and deciduous trees the annual rings are very distinct, while in trees like the birch, linden, and maple the distinction is not so marked, because the vessels are more evenly distributed. Sometimes the gradual change in appearance of the annual ring from spring to autumn wood, which is due to the difference in its component elements, is interrupted in such a manner that a more or less pronounced layer of autumn wood can apparently be recognised, which again gradually changes to spring or summer wood, and then finishes with the regular autumn wood. This irregularity may occur even more than once in the same ring, and this has led to the notion that the annual rings are not a true indication of age; but the double or counterfeit rings can be distinguished by a practised eye with the aid of a magnifying glass. These irregularities are due to some interruptions of the functions of the tree, caused by defoliation, extreme climatic condition, of sudden changes of temperature. The breadth of the ring depends on the length of the period of vegetation; also when

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the soil is deep and rich, and light has much influence on the tree, the rings will be broader. The amount of light and the consequent development of foliage is perhaps the most powerful factor in wood formations, and it is upon the proper use of this that the forester depends for his means of regulating the development and quantity of his crop.

#### MEMEL TIMBER.

MEMEL beams, according to Vice-Consul Pietsch, are required less from year to year in England. Quantities of 75,000 to 100,000 loads, which came down from Russia and Poland fifteen years ago, and found ready customers in England, cannot be disposed of any more to-day; only quantities of about 20,000 to 25,000 loads can still be sold with small profits. Business in oak beams is of no importance any more. For the old stock carried over from former years 65s. to 75s. for crown, 10s. less for the second sort, was paid. The quantity brought down by the Russian dealers was quite insignificant, viz., 5,000 cubic feet, which fetched about 1 mark per foot. In oak wainscots, no transactions took place worth mentioning. The competition of Odessa, from which port wainscots of the same quality as from Memel, with better suitable lengths, are shipped, is not to be overcome. The following prices were obtainable:—4s. for crown, and 2s. 6d. brack, per running foot; for older stocks even these rates were not obtainable, and a considerable quantity remained still in stock. The new supplies consisted only of 1,040 reduced pieces per 18 running feet, against 3,662 in 1886. The demand for oak staves continued pretty brisk during the whole year; 1,304 mille against 1,148 mille in the year preceding were shipped. One mille consists of 1,200 pieces in reduced pipes. Prices showed a declining tendency. In spring 165% per mille crown and 30% less for brack were obtainable; in summer and autumn 155% to 150% for crown had to be accepted. These rates include freight and insurance to England. The new arrivals represented a value of 162,410%, and consisted of 1,250 mille. The larger dimensions, of which only small quantities came down, were much asked for, and for these much higher prices had to be granted by our merchants. Although the shipments to England reached a considerable extent, the profits were but moderate. At the commencement of the year some sales of fir sleepers at 19s.

per load for usuals were effected, but soon this price was not to be obtained any more, and rates receded to 16s. 6d., which low quotation was accepted by Riga dealers. The merchants here, however, refused to sell at such wretched prices. Later on sales at 17s. 6d. to 18s. took place; in the course of the summer prices advanced still more, and 21s. 6d. and even 22s. was paid. The inferior sorts, from 6 to 7 inches surface, were much favoured by the buyers in England, who probably endeavoured to cover their losses caused by the higher prices and freight with inferior quality. Few speculators in England having succeeded in getting the whole sleeper business into their hands, and being enabled thereby to prevent the rising of prices to their former standing, have made it possible that business in this article remains in a quite precarious state. The dealers holding old stocks some years already have experienced heavy losses indeed. The supplies amounted to 157,295 pieces, whereas in 1866 472,972, and in 1885 609,882 pieces of blocks were brought down by the Russian producers.

#### COMPENSATION FOR ANCIENT LIGHTS.

IN the Lord Mayor's Court, the case of *Lee v. Hancock* recently came before the Recorder, Sir T. Chambers, Q.C., and a jury. Miss Lee, daughter and administratrix of John Lee (deceased), sued as the occupier of 38 Warwick Lane, E.C., to recover damages for interference with ancient lights and air, for trespass, and for so negligently rebuilding a party-wall as to cause damage and inconvenience to business, the defendant having premises next door to the plaintiff. Mr. Denniss, counsel for the defendant, argued that, under the Metropolitan Building Act, 1855, a court of common law had no jurisdiction to inquire into the matter of the party-wall. The statute said that that must be settled by arbitration. The only matter which could be decided here was the question of ancient lights and air. The Recorder, after hearing Mr. Candy, Q.C., for the plaintiff, decided that the contention of Mr. Denniss was right, and that he had no power to try the question of damage arising through the party-wall. It was eventually agreed by counsel that, rather than try the case twice, the whole matter should be referred to an arbitrator to be agreed upon. A formal verdict for the plaintiff for 300%, the amount claimed, was then entered. Another action, arising under similar circumstances, was disposed of in the same manner.



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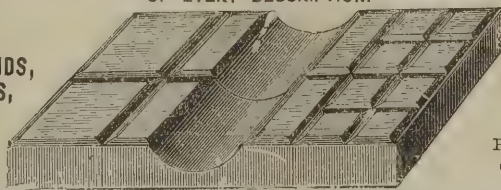
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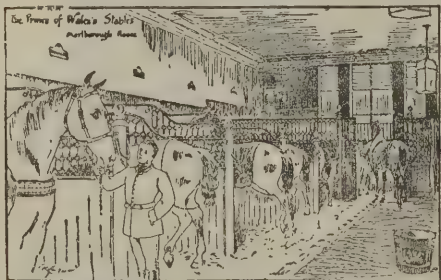
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## UNIVERSITY EXTENSION CLASSES.

THE University Extension Society at Toynbee Hall has opened its eleventh session in Whitechapel with considerable success. It is noticeable that in spite of the large increase in the supply of higher education at the East End, the demand increases in still greater proportion. The large attendance at the lectures—both literary and scientific—of men and women from all classes, shows that the thoroughness of the teaching provided by the Society meets the needs of an increasing number of students, and the fee of one shilling for ten lectures from thoroughly competent teachers, brings higher education within the reach of many who have been debarred from self-culture by financial limitations, not by want of will. Those wishing to know more of the classes should write to the honorary secretaries, University Extension Classes, &c, at Toynbee Hall, 28 Commercial Street, E.

## POINTING IN FROSTY WEATHER.

IN the Glasgow Sheriff Court recently Sheriff Berry gave judgment sustaining, with expenses, the decision of his Substitute in an action by Messrs. Lamberton & Co., engineers, Coatbridge, against Messrs. H. Symington & Sons, builders in the same place. In a note to his interlocutor Sheriff Berry says:—The defenders contracted on October 12, 1885, to execute the masonwork of a pattern shop for the pursuers, undertaking in their contract to "finish the shop complete for the lump sum of 466*l*., the job to be first-class in every respect and particular." No time was specified for the completion of the work. Whether the clause as to the job being first-class in every respect added anything to be implied, undertaking that it should be executed in a tradesmanlike manner, I do not think it necessary to determine. In any case the work undoubtedly included the tradesmanlike pointing of the brickwork. The pointing was executed as the building proceeded in October and November after the date of the contract, and there having been alternations of wet and frost subsequently the pointing came out. The pursuers, on the defenders repudiating responsibility, had the walls re-pointed; and as they had paid the contract price to the defenders, they now seek to recover the expense of the

re-pointing. I think there can be no doubt on the evidence that it is a risky and imprudent thing to have walls pointed at the beginning of winter. It is said that it is usual, and a practice of trade has been endeavoured to be established, for a workman to point the walls as the work goes on, but I am not satisfied that the evidence adduced is sufficient to establish it as a usage or practice of trade, that in the absence of a special stipulation to the contrary a tradesman who has undertaken to erect a building in a tradesmanlike manner is entitled at the beginning of winter to point the walls, and throw the risk of the pointing holding good on his employer. I agree, therefore, with the view which I understand the Sheriff-Substitute to have taken, that in such circumstances the tradesman who is not limited in time for the erection of a building takes the risk on himself. It is said in the present instance that the pursuers saw the pointing going on, and that they must be held to have acquiesced in it. I think, however, that they were entitled to regard the defenders as doing the job in the manner they thought best for their interests, and taking the risk on themselves. It has been further urged for the defenders that there was delay on the part of the pursuers in having the building roofed; that it was therefore unnecessarily exposed to wet for some weeks, and consequently that they cannot now throw the loss on the defenders. A consideration of the proof, however, does not lead me to think that there is any sufficient evidence of such delay on the part of the pursuers as to exclude them from their claim.

## REGISTRATION OF PLUMBERS.

THE Corporations of the Hartlepoons have been co-operating to promote the system of national registration of plumbers established by the Plumbers' Company. The mayors of both places have just congratulated each other at a public meeting upon the fact that their first co-operation since the incorporation of Hartlepool as a municipal borough should be in a matter of such vital moment to the public health. Dr. Gourley, medical officer of health, who took part in the meeting, said he was sure no one present could fail to recognise the importance of the movement, and he was sure he would have the support of the Health Committee. It could not be denied that in the past no one had given so much work to the doctors as incompetent plumbers. Therefore he hoped the present movement

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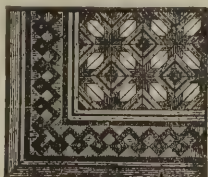
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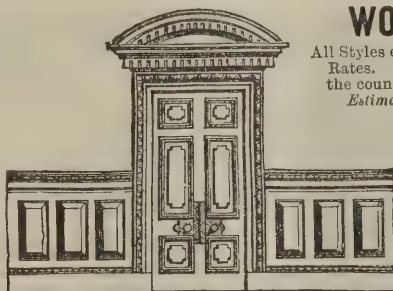
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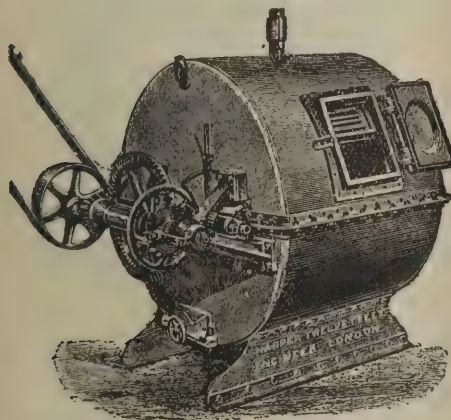
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would go on and prosper, and that before long every plumber, not only in the Hartlepoons, but throughout the country, would be registered.

### MANCHESTER SHIP CANAL.

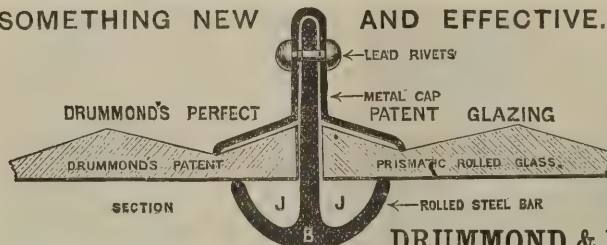
THE old lower road leading from Thelwall village to Latchford has been closed to the public, the new road, starting from Morris Brook Farm and coming out on the Knutsford Road, being opened for public traffic at the same time.

Coming from the junction of the canal and road towards Thelwall, the canal has now been excavated for its whole width to a depth of one working of the navy, after which for a distance of about three-quarters of a mile work seems at a standstill for the present, with the exception of pumps keeping the cutting free of water. Nearly opposite Thelwall Church a navy has started a heading in the second depth, and for the full depth of some 20 feet it is excavating through a hard solid stratum of red sand, thousands of tons of which are being massed in huge embankments on the north side of the canal cutting. The next active operations are being carried on at "Wilgreaves," an island made by the bend of the river and a lock. At this point the river is to be diverted, to obviate the canal being cut through it twice, and this work, which has been wholly executed by hand labour, is now almost completed, the ends only requiring to be cut through. The huge pile of sand which has been removed from this cutting forms at present a distinct feature of the landscape. Crossing the second bridge leads into Statham. For some time the working in this part was carried on by means of steam "grabbers," but a navy has now taken their place, and has made surprising headway through the sand and clay during the last few weeks. In the early summer another navy started at Statham Lane, heading towards Thelwall, and these two are now facing each other at a distance of about 160 yards, having made a trench or cutting some 20 feet deep and 40 feet wide. In Statham some very fine strong clay has been cut to, and this is being utilised by the contractor for brick-making purposes. A very complete and elaborate plant has been laid down, with a pug mill in full work and another being erected, and these two, when in full operation, will turn out about 200,000 bricks weekly. This quantity can be continued all the winter through, as large sheds capable of drying by means of flues 160,000 bricks each five days are now in full working order. Five large Scotch kilns (another is being erected), capable of burning 100,000 bricks in

four days, are also in operation. This locality, where twelve months ago was unbroken meadow land, is now teeming with busy life. A number of wooden cottages have been built and tenanted, valuable engines and machinery are in motion, lines of railway and locomotives in all directions cover the ground where a few years ago a freshet from the river inundated the land to a depth of 4 or 6 feet. Passing over the next bridge, an island, known as Rixton Ley, is entered, and this would seem to be composed of quicksand. On this section a German navy somewhat on the principle of a dredger is at work. Two locomotives are engaged in attending on this expeditious worker, which can fill 500 waggons a day. Passing over the next bridge, Lymm Eye is reached, and from this to Warburton, a distance of about a mile, only hand labour, assisted by locomotives, is engaged.

Although during one week the navvies on the Barton and Eccles and Irlam and Flixton sections of the Ship Canal works were compelled to cease work at intervals in consequence of the boisterous and inclement weather, a visit to examine the works revealed considerable progress in their construction. At Sticken's Island not only has the required depth of the canal been reached, but the foundation of one of the large locks has nearly been completed. The formation of the track railway underneath the southern arches of the aqueduct and Barton Bridge is in a forward condition, and ledges have been cut into the solid rock on the southern bank of the river. A portion of the hedge separating the river from a field adjoining the highway opposite St. Catherine's Schools has been taken down, and the necessary preliminaries are being pushed forward for the construction of the railway through the field until it reaches the river about 100 yards lower down, and piles are there driven into the bed of the Irwell for the continuation of the railway across on to the Salt Eye meadows. At Boat Lane, Flixton, quite a colony is being established, there being already erected over twenty workmen's huts, in addition to a hospital, the contractor's offices, stores, and engine sheds. Excavations have been commenced in the meadows at Lower Irlam, and the ballast railway from a point south of Irlam station, on the Cheshire lines, has been extended to beyond the Calemanka locks in the direction of Hulme's Bridge, and after two or three wooden bridges have been erected across the river, the Irwell at this point taking a very zigzag course, there will be one continuous length of lines from Salford to Irlam. Three additional locomotives were employed last week on the Irlam and Cadishead section, which now ranks amongst

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the most active on the whole undertaking. Between New Barns, Salford, and the Boathouse, Hollins Green, twelve track bridges have been made across the river for ballast lines.

### THE ENGINEER OF THE FUTURE.

*Concluded from last week.*

Now, in the matter of the training of engineers, the alternatives which are being discussed at the present time in this country are, an apprenticeship beginning at an early age, after only a very ordinary school education, or a course of practice in the works, preceded or followed by a course of training in one of the colleges in which the scientific principles which underlie practice are taught. Now, to my mind it is self-evident that the scientific basis of practice should be known and understood by all who have to direct that practice. Underlying all the rapid developments of practical engineering there are the unvarying laws of nature, which all the works of our hands must obey, however ignorant we may be of them, and however we may plan and fight against them; "and," as Professor Huxley puts it, "nature never overlooks mistakes or makes the slightest allowance for ignorance." Every item of good practice must have its reason and its explanation in the nature of things, whether we know that reason or not. To every effect there must be a cause, to every how a why, and every cause and every why is knowable. We are still far from knowing all; but let every one who has to act upon the how know all that he can of the why. We often—I might almost say usually—hear theory spoken of as something almost necessarily at variance with practice. No notion could be more absurd or utterly ridiculous. Theory—properly understood—is an orderly system of reasoning regarding the causes of things. Can the causes of things be at variance with their own effects? Every business man knows how invaluable is system and order to him in all his transactions, and he is not content to know simply that he has so much to the good, or to the bad, at the end of a year; but he must know the details of every transaction, where he has gained and where he has lost, so that he may profit by his experience. And so it must be in engineering practice. To have a firm grasp of his work, the engineer must know not only, for instance, that an engine gives such and such results, but why it gives them. Where does the economy

come in, and where are there sources of loss that may be avoided in the future. All this is self-evident, I say, to my mind; but there are those who will tell you that it is not so. They tell you that you are to conduct those dealings of yours with the "sources of power in nature," without putting your transactions in any orderly form. It is enough for you to grope your way by hard lessons of failure and chance runs of luck, without making up, even in your own minds, a profit and loss account, and tracing out to what causes your successes have been due, or where you have missed the way and failed. I quote the *Engineer*:—"At the root of all this worry about technical education lies the delusion that unless men are taught certain things they cannot produce, let us say, steam-engines, or cotton, cloth, or iron, the fact being that a knowledge of the things in question is wholly unnecessary." There is something of melancholy truth in this. We know that men can and do produce steam-engines with no knowledge of theory, just as men conduct business—on a very large scale too—without keeping accounts, and some one has to bear the consequences. Is it to the credit of engineering to-day that, though Watt a hundred and twenty years ago introduced the principle of steam jacketing, we should find an engine submitted for a competition in this 1888 with a wet blanket of exhaust steam around the cylinder; and that, too, in the case of an engine with a very high range of expansion in one cylinder? This "seems scarcely credible, but it is true." Or are we to look with satisfaction upon the practice of to-day, when we find engines now being made which can do no better performance as regards economy of fuel and water than those which Watt's genius and knowledge produced so long ago? And our engineers of to-day, in many—I may say most—cases are quite ignorant of any accurate methods of determining even what their engines can do. But many engineers hold, with Lord Armstrong, the view that all the information which those require who are to direct labour "can be found in a condensed and tabulated form in handbooks applicable to all kinds of constructive art. Such technical information is in this form available to every man who can read and do arithmetic, however ignorant he may be of the scientific methods by which such tabulated results have been arrived at." I am sorry to have to differ from so high an authority; but I can assert, without the slightest hesitation, that to all scientific men who have come much in contact with those who adopt this method, it is notoriously not the case that they can correctly read and apply such information.

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PATTERN BOOKS ON APPLICATION.



To comprehend, however, the very special need which exists for scientific knowledge on the part of our engineers at the present time, we must look at the position we have reached in the development of our craft. When a great new departure is to be made in any craft, the first question must be as to what to do, and when that is settled the difficulty must be faced of how to do it. The first step, then, is in theory; the next is in practice, or in handicraft. The early engineers laid a foundation of principles upon which to act, and lines along which to proceed, and the succeeding generations had to find out how to carry these ideas into effect. In this part of the work, in mechanical engineering at least, the great labour has been in the invention and perfecting of the tools, and in training men's hands to the new employments. And so we find, in the history of the steam-engine, for instance, that the work of the successors of Watt and Stephenson has mainly been the carrying out to successful practice of the ideas which they and their contemporaries and immediate successors gave us as a legacy. Few great and radical improvements in principle have been introduced in engine-building since their times. But now we know that we can make almost anything that can be designed, and that with an accuracy and perfection—thanks to our system of division of labour—which is truly wonderful. Again we have reached a stage at which the question is not how to manipulate our materials, but into what our materials shall be fashioned. Hence the necessity for a new race of scientifically trained engineers, and from this need have arisen such places of education as that in which we are met.

Our thinkers and investigators have given us a wealth of pure scientific knowledge, and we have a legion of highly trained privates in our mechanics, equipped with implements of wonderful precision, ready and waiting to execute the commands of their generals and captains, the engineers. Our work then, as engineers, is to put into and adapt to our immediate needs and put into operation the methods of attack which the investigators, with a full knowledge of the possibilities which lie before us, have supplied for our guidance. The engineer must be the interpreter of scientific truths, and to this end he must know those truths; and hence it is the work of colleges such as ours to teach those scientific principles and their application to practical problems. The former is the work of the departments of mathematics, of physics, and of chemistry, and the object of the engineering department is to teach and to train its students in the methods and processes by which the principles of those sciences may be transcribed into the practice of engineering.

The aim of the whole, so far as engineering is concerned, is to supply to the student the rules and laws which must guide him in his work, and the mental ability to correctly perceive and to apply them.

I have said, then, that our present position is akin in many respects to that in which the early engineers found themselves, though vastly wider and more full of promise. Now the statement is constantly being made that the great leaders in engineering have been simply practical men in the modern sense of that term—that they have undergone such an apprenticeship from an early age as certain so-called authorities would have the engineers of the future to undergo. Nothing could be more misleading. In some few cases these leaders have had only a practical training, in some only a theoretical one; but in most they have—as we advocate—undergone a course of practice and a course of study. I shall endeavour to give you as briefly as I can the life histories of the great leaders in engineering, so far as this question is concerned. I think I do not make an unfair selection when I take Smeaton, Telford, John Rennie, George Rennie, Watt, Fairbairn, George Stephenson, and Robert Stephenson as representing the engineers of the early period. And I should wish you specially to notice in how far the careers of those men bear out the principle of an early apprenticeship, and how far they support the contention that a knowledge of scientific principles is necessary for the engineer.

### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

### APPLICATIONS FOR PATENTS.

14665. William Whalley Cottam, for "The Utilisation of earthenware and other pipes, by the aid of a flap or valve, for closet-flushing purposes." October 12, 1888.

14681. Joseph Tolterton, for "Improvements in fireproof curtains for the stages of theatres and the like." October 12, 1888.

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Mr. John Grundy.

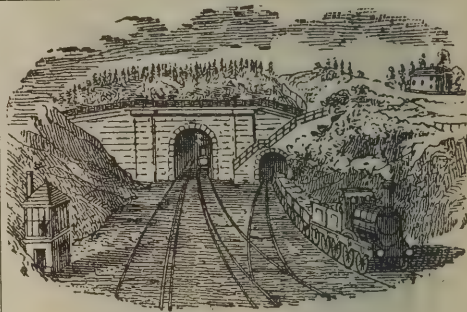
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14685. William Henry Kent, for "Improved combined pocket-eraser and case." October 12, 1888.

14687. John Lowe, Harry Marvin Abbott, and George Gwilt, for "An improved portable electric lamp, applicable also for house lighting." October 12, 1888.

14707. Joseph Hibberson, for "Improvements in valves, taps, or stop-cocks, for gas, water, or other fluids." October 13, 1888.

14709. William Horsfall, for "A new or improved construction of furnaces, for burning town's or other refuse." (Complete specification.) October 13, 1888.

14724. Lawrence Wilson, for "Improvements in parquetry, and other similar composite wood, and artificial wood surfaces." October 13, 1888.

14733. Alexander Noble, for "Stonemason's points or chisels, double pointer, and chisel-holder." October 13, 1888.

14734. Bridgman Russell, for an "Improved air-inlet ventilator." October 13, 1888.

14743. John Morphew Martin, for "Draught and dust-preventer to supersede the old-fashioned sand-bags." October 13, 1888.

14746. John William Youngson, for "Self-fastening, burglar-proof sash-fastener." October 13, 1888.

14750. Clement Wain and Augustus Clery, for "An improved cement or artificial stone." (Complete specification.) October 13, 1888.

14759. Alexander Robert Murison, for "Single and double-acting pumps for all liquids." (John Christie, ss. *Attonower* at sea.) October 13, 1888.

14768. Alfred Coxon, for "Improvements for drying slurry in the manufacture of cement, by the use of an extracting fan, to create a draught for kilns, furnaces and boilers." October 13, 1888.

14786. James Broadhurst, for "An improved oven or kiln for firing pottery and other articles." October 15, 1888.

14790. Benjamin Amulson Dougherty, for "The detection of heat and fire on board ship and on shore, in houses and warehouses." October 15, 1888.

14830. William Marston Derrick, for "A new or improved method for the ornamentation of glass." October 16, 1888.

14853. George Pankhurst, for "An improved brick, tile or slab for building and other purposes." October 16, 1888.

14870. Theodor Kromer, for "Improvements in keys for doors and other locks." October 16, 1888.

14881. Thomas Houlding Bromly, for "A combined circular

saw, gig saw, lathe, drilling, milling and mortising machine, moulding, punching and key way cutting machine, &c." (Complete specification.) October 16, 1888.

14900. Thomas Robinson Paxton, for "Improvements in attaching door knobs to their spindles." October 17, 1888.

14968. Walter Stead, for "An improved method of constructing and suspending the vertical sliding sashes of windows, &c." (Complete specification.) October 18, 1888.

14970. Frank Prail, for "A portable combination ingle-nook or enclosed chimney corner." October 18, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

11814. Benjamin Barstow Snell, for "A spring catch to be applied to fasteners of doors, sashes and shutters, which locks cross-bar and entirely prevents opening from outside." August 16, 1888.

12111. Thomas Gahan, for "Improvements in ventilating screens for windows and similar openings." August 22, 1888.

12533. John Balbirnie, for "Improvements in fireplaces, grates, ranges, stoves and furnaces." August 31, 1888.

12685. Alfred Henry Spaul and Cornelius Callan, for "Improvements in window-sash fastenings." September 3, 1888.

12799. Hiram Jefferson Wells, for "Improvements in pumps." September 4, 1888.

12884. William Hickens Rickard and Thomas John Rickard, for "Improvements in or connected with hydraulic safety apparatus, applicable to hydraulic lifts or cranes, steel converters, and such like machinery." September 6, 1888.

12924. John Bradshaw, for "A chimney pot or top." September 7, 1888.

12984. George Robinson Cumpston, for "Improvements in means for preventing the spread of fire in buildings." September 8, 1888.

13199. James Hopwood, for "Improvements in the valves of taps for steam, water, or other liquids." September 12, 1888.

13225. George Chatterton Soper, for "Improvements in or relating to apparatus for mitring frame and panel mouldings and the like." September 12, 1888.

13305. Alfred Julius Boulton, for "Improvements in wood-planing machines." (Pedro Dominquez, Spain.) September 14, 1888.

13327. Hiram Waddington, for "Improvements in draught-preventers for doors or windows." September 15, 1888.

13384. Thomas Penn and Alfred Edward Penn, for "Improvements in and connected with oil-lamp and other burners

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or jets used for the burning of any hydrocarbon, and in the means or apparatus for operating the lighting and extinguishing of the same." September 17, 1888.

13525. Walter Ralston, for "Improvements in wall-papers." September 19, 1888.

13574. William Job Howcroft, for "Improvements in vehicles employed in the removal of mud and other refuse." September 20, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

14384. Richard Hocking and William John Hocking, for "Improvements in and relating to water-closets." October 22, 1887.

16048. Thomas Wilkins, for "Improvements in raising or adjusting mechanism for window-sashes and other sliding articles of similar character, required to be raised and lowered." November 22, 1887.

16510. Benjamin Oldfield and William Oldfield, for "A method of ornamenting in imitation of marbles and grained inlaid woods in combination with printed designs." December 1, 1887.

17206. Alfred James Hopkins, for "Improvements in water-closet apparatus." December 14, 1887.

17993. Joseph Winterflood, for "Improvements in chimney and ventilating cowls." December 31, 1887.

9556. James Holroyd, for "Improvements in the construction of faience or glazed terra-cotta mantelpieces, firesides, fronts of grates, and fenders for hearths or firesides, and such like articles." June 30, 1888.

13354. Johannes Sjöström, for "Improvements in, or relating to, fences or barriers, and supporting posts therefor." September 15, 1888.

13430. Clarke Merchant, for "Improvements in cowls for ventilators and chimneys." September 17, 1888.

#### PATENTS SEALED, OCTOBER 19, 1888.

10808. John Hurst, for "Improved apparatus or pump for lifting water—muddy or otherwise—or any other fluid or water mixed with sand or other gritty material." August 6, 1887.

11237. Harry Noble and George Haley, for "Improvements in the hearths of fireplaces, fenders, and dados of metal and enamel." August 17, 1887.

13407. Henry Marle, for "An improvement in drawing apparatus, viz., a demonstration stand for solid drawing models." October 4, 1887.

13534. Thomas Charles Hutchinson, for "Improvements relating to the treatment of blast-furnace slag, for the manufacture therefrom of hydraulic or similar cement." October 6, 1887.

13537. Thomas Constantine Fawcett, for "Improvements in brick-making and brick-drying machinery." October 6, 1887.

13976. William Henry Moore, for "Improvements in apparatus to prevent the bursting of water-pipes by frost." October 14, 1887.

4518. John Henry Marston, for "Apparatus for opening and closing fanlights, skylights, or casements." March 24, 1888.

9733. Elliott Emanuel, for "A double fan for wash-out closets." July 4, 1888.

#### ABRIDGMENTS.

"Improvements in the manufacture of material for use in the construction of fireproof curtains of theatres, ceilings, columns, partitions, &c." No. 37082. 1888. John B. Lee, of the Titancrete Co., 8 Deansgate, Manchester.

*Claim 1.*—The manufacture of the specified and indicated articles from a material or composition consisting of a mixture of cement or concrete and asbestos fibre, either with or without a further addition of finely broken or crushed slag, coke, fire-brick, or other suitable non-combustible material, in the manner for the purposes and substantially as hereinbefore described and shown.

"Improvements in the manufacture of decorative leather." No. 12393. 1888. H. J. Haddon, 18 Buckingham Street, Strand.

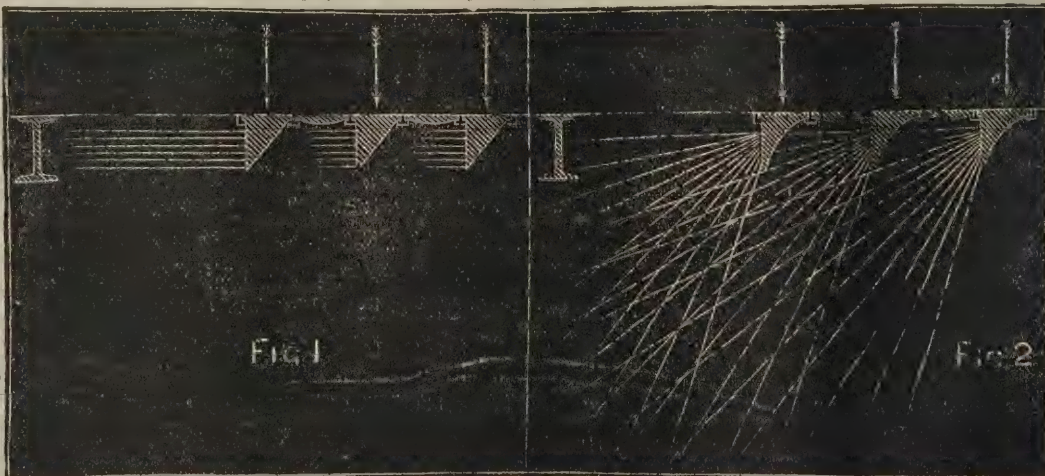
*Claim.*—The moulding of leather by pressure in a suitable mould by rubber sheets or the like, substantially in the manner described.

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Fig. 1 shows how the ordinary prism or semi-prism, by receiving the rays on a plane reflecting surface, throws them forward at one angle only, in parallel lines close to the ceiling.

Fig. 2 represents the Patent Dioptrical Lens, and shows by comparison how the rays of light, striking on the curved inner surface, are reflected forward through the face of the lens in every direction, filling the whole angle of 90°, thus illuminating the apartment from floor to ceiling and from wall to wall.

From the above diagram it will be seen wherein consists the advantages claimed for Wilson's Patent Lenses. The objection to the semi-prism is that it reflects the light, as shown in Fig. 1, at such an angle as to be of little use, and more especially if the line of the ceiling in below the line of the pavement; then the value of the semi-prism as a light projector is entirely lost.

It will be seen also, on reference to the above diagrams, in Fig. 1 that the first row of semi-prisms obstructs the rays of light from each succeeding row, whereas in Fig. 2 the bulk of the rays of light are projected at such angles as to pass unobstructed into the room.

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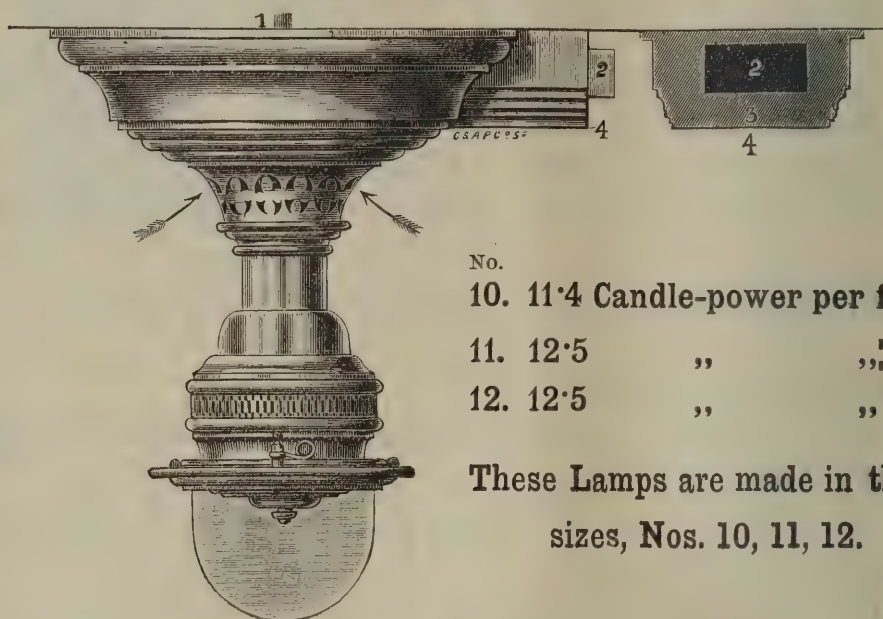
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# The Architect.

## THE WEEK.

THE Royal Scottish Academy has long remained in a condition that needs reform. As a means towards that end the governing body have received petitions for an increase in the number of the Associates, and for the conferring voting powers on the Associates. They come from artists who do not belong to the Academy and from the Associates. It is generally supposed that the Academicians of Edinburgh have a higher opinion of themselves than their brethren in London, and a manner of superiority is sometimes adopted by them which is amusing. No wonder so many young artists, when they dream of the possibility of one day having to assume such airs, should fly southwards in order to escape from the ridiculous. At the present time any reputation which the Academy may possess is derived mainly from the works of the Associates. Let any amateur be asked to recall pictures or statues by one-half of the Academicians—and we may throw in the President—he will find himself in a difficulty. Their works have already passed out of recollection. Is it wise to have so many nonentities ruling the Academy, whilst the ablest members are in the position of the outside public?

THE new Spalding Club bids fair to rival its great predecessor. The full measure of five hundred members is maintained, and it is as difficult to gain admission into the society as to become a member of a select club. The two works issued during the year were "Memorials of the Family of Skene of Skene," with reproductions of sketches by the late JAMES SKENE of Rubislaw, and "Cartularium Ecclesie S. Nicholai Aberdonensis," with copies of sketches by Mr. G. REID, R.S.A. The illustrations have delayed the production of the books, but before the end of the year it is anticipated the monograph on the heraldic ceiling of the cathedral church of St. Machar will be ready for presentation to the members. The Lyon king of arms will explain the heraldry. Among the works which are in progress are the following:—"Collections for a History of the Shires of Angus and Mearns"; "The Folklore and Place Names of the North-Eastern Province"; "A History of the Family of Burnett"; "The Register of the Scots College at Rome"; "The Diary of the Scots College at Douai"; "A Bibliography of the Shires of Aberdeen, Banff, and Kincardine"; "A Calendar of the Correspondence in the Town-house of Aberdeen"; HECTOR BOECE'S "Lives of the Bishops of Aberdeen," reprinted from the edition of 1522; "Selections from the MS. Biographical Collections of the Rev. ROBERT WODROW, in the possession of the University of Glasgow"; "The Chartulary of the Church of St. Nicholas"; "Selections from the Records of Marischal College and University." The Archæological Committee have also issued a circular relative to the folklore, place names, and bibliographical investigations.

THE Glasgow International Exhibition is now drawing to a close, and the fate of the buildings has had to be determined. When the ground was conceded to the Executive Committee for the erection of buildings, it was agreed that the site was to be restored to its original condition. The committee considered it would be better for all parties to make over the buildings to the Town Council, on the understanding that the restoration of the site would devolve upon the Council. At the same time it was suggested that it would be well if the Council preserved that part of the buildings which formed the Fine Art Section until a fine arts gallery worthy of Glasgow was provided. Another suggestion was that such models and exhibits in the Indian Section as were considered fit for exhibition in the Museum of Glasgow should also be taken. Valuable gifts are thus made over to Glasgow in the simplest way. It would be well if the whole of the exhibition buildings could be conserved; but they are mainly constructed of wood, and it has yet to be seen whether they can stand a Scotch

winter. In June a good deal of damage was done by the rain which found admission to the stalls. But if the buildings could be rendered watertight, they could be well utilised for an industrial museum without any detriment to the art galleries. The Town Council will have time to consider the question, for it is well to know that on Tuesday the offer of the Exhibition Committee was accepted.

THE definition of what is an inflammable or combustible roof was tested on Tuesday in the Westminster Police Court. The district surveyor for St. Margaret and St. John, Westminster, summoned the secretary of the Royal Aquarium for infringing the Building Act by covering the Aquarium with a material that was combustible. It was described as a close wire mesh embedded in a gelatinous substance, and is supposed to be a foreign production. Witnesses stated that the new roof was practically fireproof. Mr. WILLIAM EMDEN said he considered that a glass roof was a constant source of danger. In places of amusement where it existed he had had wire netting put above, and in some instances under, the glass, because contraction and expansion caused breakage, and, in the event of fire, burning embers fell through glass without hindrance. Molten glass would pierce any one like a bullet. The magistrate gave judgment against the surveyor. He said there was hardly a substance that could be described as incombustible. It was a question of degree, and as he considered that the roofing complained of came within the definition of un inflammable, "not easily lighted," he felt that he should be doing a grievous injustice if he strained the Act of Parliament to decide that the Aquarium skylight was combustible, and order it to be removed at an enormous expense. The summons was therefore dismissed.

THE programme of the Leeds and Yorkshire Society for the coming session, which opens on the 12th, cannot be objected to on account of wanting interest. On November 26, Mr. A. MARSHALL, of Nottingham, who has published books on the subject, will discourse on the "Furniture and Woodwork of the Seventeenth Century." Mr. J. A. HEATON will next follow with a paper on "Beauty in Colour and Form; How to Seek, Where to Find," which ought to ensure a large audience. At the first meeting of next year, Mr. J. S. GARDNER will explain "Art Metalwork." Mr. R. T. BLOMFIELD takes up "Architects of the English Renaissance" for a theme, and Mr. R. J. JOHNSON will put in "A Plea for Old English Art." Miss GARRETT, who has made a mark as an artist for the household, will talk about "Interior Decoration and Furniture." Decoration inspires another author, for Mr. SCOTT MORTON is to expound the mysteries of "Colour in Architecture and Interior Decorations." Lastly, Mr. HADFIELD, of Sheffield, will bring the series to a close with a paper on "Canterbury Cathedral." It would be well if all the metropolitan societies had command of so excellent a set of contributions.

MR. JOHN GRIFFITH, who has died at the great age of ninety, was for many years well known among the architects of the City, where he resided as well as practised. Although most benevolent and generous, he has left over 170,000*l.* and about 20,000*l.* will be distributed for charitable purposes. His fortune is much larger than the one left by Mr. JAMES EASTON, who was prominent as an hydraulic engineer. The firms of EASTON & AMOS and EASTON & ANDERSON carried out several large contracts for waterworks, and their hydraulic machinery was known all over the globe. Mr. EASTON was considered to be a very rich man, but recent losses probably were the cause of his executors not having to pay duty on a larger sum than 91,000*l.*

SCULPTORS who care to enter into a competition have now a chance. It is intended to erect a bronze statue in Grantham of the Hon. F. J. TOLLEMACHE, who at one time represented the borough, and the sculptor is to be chosen by competition. The height of the statue will be from 7 feet to 9 feet. The money for the work appears to be easily obtained, for already subscriptions are promised amounting to over 1,500*l.*



## SIR WILLIAM SIEMENS.\*

A PHYSIOGNOMIST, who closely observed Sir WILLIAM SIEMENS on the evening when he conducted the Princess of WALES through the Fisheries Exhibition at South Kensington, must have concluded that the chairman was either very weary or very ill. He went through the task mechanically, without any apparent recognition of the privilege of his position, which was the crowning point of his career, and at times his voice sounded as if he were speaking a language which he was unable to comprehend. Yet in physique Sir WILLIAM appeared a strong and large-boned man, he stood nearly six feet in height; he was broad-chested, and well set up. The face, although at the time lacking in expression, was not without power, the forehead was ample and well developed, the bushy whiskers were parted to reveal a firm chin, and as his locks were scanty, there could be no objection raised against that redness which at one time brought him a nickname. The mouth was unusually large, and suggestive of a man who had little mercy in offering sacrifices to gain his own end. Did the excitement of that night tell more upon Sir WILLIAM than he was able to realise? A few months afterwards he knocked his foot against the kerbstone in Piccadilly and fell. In a fortnight he was dead, and then the doctors announced that under any circumstances he could not have lived long, and, as usual in such cases, they wondered how he reached his sixtieth year.

Two-thirds of his life were spent in England. During that time his name repeatedly appeared in the lists of patents, and he figured as an engineer, a manufacturer, and a man of science as well as an inventor, but he was only beginning to gain some popularity when he was so suddenly carried off. It was, in fact, difficult to imagine him as an individuality. He was one of four brothers who were all men of importance, three of them resembling Sir WILLIAM in inventive power, and as their business was world-wide, it was not unreasonable to suppose that SIEMENS was simply the distinguishing mark of a great company comprising many personalities and a variety of names.

That mighty business was the creation of poor men, who had to depend for success upon their own exertions. They were not only the heads of the firm but continued to be its chief workmen, upholders no less than creators. What is still more remarkable is that they were successful because they were scientists. They first worked out their schemes in theory believing, like all Germans, in the poet's words:—

Mit dem Genius steht die Natur im ewigen Bunde;  
Was der eine verspricht, leistet die andre gewiss.

For that reason the history of the SIEMENS family has an especial importance at the present time, when so much is talked about the subject of technical education. Few men can be so fortunate as the brothers in being among the earliest to utilise powers of nature which were supposed uncontrollable, but all may at least learn to imitate them in depending on principles rather than on empiricism, and in recognising the superiority of reasoning over accident.

The father of so notable a family was a farmer, who was well educated according to the old system, but he could not be more ignorant of science if he had been brought up in an English university. He died in his fiftieth year, when his eldest and cleverest son, WERNER, was twenty-three. Sir WILLIAM SIEMENS was the fourth son, FRIEDRICH was fifth, and CARL the sixth son. Two other brothers also made their mark, but in different ways.

WERNER, having entered the Prussian Artillery, rose to be superintendent of the workshops. He was a type of the scientific officer. He can claim to be the inspirer of his brothers, and under his direction they made their fortunes. When he was a cadet at Magdeburg in 1838 he proposed that WILLIAM, then a boy of fifteen, should enter the trade school of that town and be under his care. As the number of subjects in the school was limited, WERNER undertook to teach his brother mathematics. That would have to be omitted from the curriculum, since the English language was substituted for the science. The lessons were given

"in the early morning hours, before the opening of the school and the commencement of military duty." Three years afterwards WILLIAM was sent to Göttingen, where KARL HIMLY, a brother-in-law, was professor of chemistry. He spent about a year in the university, restricting his studies to science, and then his brother was able to obtain a place for him in engineering works at Magdeburg. But he was not destined to remain there for the two years' term which was proposed. With the help of his brother-in-law the chemist, WERNER SIEMENS had perfected a process of electro-plating, for which he took out a patent. England was supposed to be the most profitable field for its exercise; and where could a better agent be found than the young brother who had acquired a Magdeburg version of the language? But cash was required for the voyage, and it was necessary to borrow the modest sum of 100 thalers from a relative. That money, with a few pounds obtained on the way by selling some of the solutions in Hamburg, formed the financial basis of one of the most important houses of our age. WILLIAM arrived in London in March 1843, and, having scanty resources, his first domicile was a little inn called the Ship and Star at Sparrow Corner, near the Minories.

It is unnecessary to say that electro-plating was not then unknown in this country. In 1837 and 1838 SPENCER made experiments in that process, and, as usually happens with important inventions, JACOBI was simultaneously working towards the same end under the protection of the Emperor NICHOLAS. Messrs. ELKINGTON were able to apply the process about 1840, and if we believe the French, it was according to the attempts of their countryman DE RUOLZ. WERNER SIEMENS shrewdly recognised that if he competed it must be under restrictions. He therefore enjoined his brother to ignore colour and beauty of gilding and to restrict himself to simple plating, relying entirely upon the durability of the deposit as laid by the new process.

WILLIAM SIEMENS was advised by a firm of patent agents to bring the process before Messrs. ELKINGTON, and after treating with them through a local firm he went to Birmingham. He then discovered that his brother's prized solutions were actually described in the patent of the firm. But questions of novelty were generously set aside by Messrs. ELKINGTON, and it was decided to judge the new process by a practical test, viz. the deposition with a smooth surface of 30 dwts. of silver upon a dish-cover. He was so far successful that Messrs. ELKINGTON agreed to a patent being taken out at their expense for improvements connected with the deposition of metal, and in the apparatus for that purpose. A sum of about 1,500*l.* was paid to WILLIAM SIEMENS, although the process was not of any great benefit to the firm.

So much money was welcome to the SIEMENS family, and WILLIAM was welcomed on his return as if he were a second JASON; but to a man like WERNER SIEMENS, who knew something of strategy, it was still more important. It revealed to him that Englishmen were ready to pay for the slightest improvements of an invention, and that in his brother he possessed an agent who was at once a commercial traveller and a scientific expert. Is it surprising that another effort was made to gain English money on terms so easy? A project of WILLIAM's for an improvement in the governor of a steam-engine was put into shape with the aid of a practical mechanic, and to it was joined BALDAMUS's or APPEL's process of reproduction, to which the name of anastatic printing was given in England.

In order to dispose of the rights of the two properties, WILLIAM came over in February 1844. He was advised by the Prussian Consul to associate himself with Mr. JOSEPH WOOD, a civil engineer, who took out a patent for the governor, and read a paper upon it at the Institution of Civil Engineers. The value set upon this one invention by WILLIAM SIEMENS was 36,000*l.*, a proof that even in his youth he was not too modest in his consideration of himself. Everything that could be done by interest was accomplished to bring the governor into general use, and improvements were made in it, but up to this day there seems to be a prejudice against it on account of its delicacy. It is considered better adapted to regulate the instruments of an observatory than the machinery of a factory. The anastatic process was not more successful in bringing profit. The value was put down at 50,000*l.*, but as nobody was dis-

\* *The Life of Sir William Siemens, F.R.S., D.C.L., LL.D., &c.* By William Pole, F.R.S. London: John Murray.



posed to buy the rights at that price, an attempt was made to set up an establishment for the new kind of reproduction. The success of the copies is seen in the circumstance that, by the desire of a Committee of the House of Commons, letters bearing anastatic copies of postage-stamps were sent to the members, and the stamps were accepted as genuine by the Post Office examiners. Mr. POLE is evidently unaware of the history of the process. He calls RUDOLPH APPEL, who managed the printing in London, a workman, but APPEL claimed to be the inventor of the process, and the prepared plate was called after him, the *appelotype*. It was he also who invented "the anti-acid and anti-anastatic paper," which he introduced in order to calm the fears of people who believed that the process would give rise to forgeries of all sorts.

The second visit of WILLIAM SIEMENS brought heavy losses in hard cash to many people, and disappointment to himself and his family. In 1845 he seems to have sought employment in connection with one or other of the numerous railway schemes of that year, and a few months afterwards the brothers came to the conclusion that they must give up working the patents for the steam-governor and the printing. The failure was undoubtedly caused by the unreasonable valuation which WILLIAM had placed upon them. It did not strike him that purchasers needed a profit, and he was justly punished for his cupidity. All through his life he was a hard bargainer.

In 1847 WILLIAM SIEMENS settled down in Manchester, where he was engaged by Messrs. HOYTE to devise improvements in calico printing. But his restless brain was not satisfied with that sort of employment. His ambition was to make the steam-engine more effective by its becoming more economical in working. A new theory of heat had been promulgated by JOULE, of Manchester, and WILLIAM SIEMENS was probably the first man who was able to recognise its practical value. He designed a "regenerative engine" and a "regenerative condenser," which were to obtain more efficacy from heat than was practicable with the ordinary steam-engine. FOX & HENDERSON, of Birmingham, undertook to make the engines, and agreed to pay SIEMENS a royalty as well as a salary of 400*l.* a year for his advice. They also agreed to undertake his process for "regenerative evaporation," which was expected to be taken up by salt-workers and sugar-boilers. But the firm soon discovered that the inventions were not profitable. On a French contract for fitting-up salt works there was not only a loss, but the whole machinery was thrown on their hands. WILLIAM SIEMENS, however, took such catastrophes as a philosopher: they were to him only incidents that were of use in his education, and in helping him to make his way in the world. He was enabled to obtain experience in one of the largest establishments in England—for FOX & HENDERSON'S workshops merited that title—and his brother FRITZ was also able to be initiated into English practice at the same time.

Meanwhile WERNER SIEMENS was turning his own attention to applications of electricity. He informed his brother in England at the end of the year 1846 that he was resolved to devote himself to work of the kind, as he believed in its future and felt that he had a mission for it. In the course of the next year he discovered an able mechanic named HALSE, and on the first opportunity entered into partnership with him, his intention being to manufacture telegraphic instruments, signals, &c. But with an eye to the future the works were to be known as a machine factory, and by that title it was hoped all classes of engineering might be introduced. The factory was humble in appearance, but the partners were successful, and in 1851 they removed to much larger premises. It was not long before WILLIAM SIEMENS was asked to become the English agent of the firm.

He was still absorbed with the problem of the conversion of heat into energy, and had worked out more than one solution of it. In 1853 he was able to read an elaborate paper on the subject before the Institution of Civil Engineers, and in 1856 he described his new engine to the Royal Institution. But in the realisation of his theories there were constant disappointments. One of the engines in the Paris Exhibition broke down when the Emperor came to examine it; another, which was set up at Stettin, was ruined by the bursting of a cylinder, and when

SIEMENS went there to ascertain the cause, there was an explosion from which he was glad to escape. A company was established on the Continent to construct regenerative engines according to his system. But it had to be dissolved, for the reports of the engines which were made were too unfavourable, and it was found that the economy was dearly purchased. The old-fashioned engine of WATT was not to be superseded. WERNER was simultaneously trying to improve the apparatus for regenerative evaporation, but he had to confess that the more he did the worse it became, and he had to abandon it.

The failure which attended those applications of the new principles of the theory of heat and energy was happily absent when the improvement of furnaces was taken up. This work exemplified the power of a third brother. Mr. POLE informs us that "during the year 1856 FREDERICK SIEMENS appeared to have conceived the happy idea that the regenerative principle which WILLIAM had been so earnestly striving to carry into effect by complex arrangements of engines and evaporators, might be made available in a much more simple manner by applying it directly to the ordinary furnaces in which the fuel was consumed." The invention was at once a success, and the saving of fuel in iron manufacture alone is estimated at 500,000*l.* a year.

It was not the only success. The water meter which WILLIAM SIEMENS invented was so well patronised as to bring him in 1,000*l.* a year from royalties in Great Britain alone.

But profits of that amount were trivial if compared with those which arose from the telegraphic business of the brothers. WERNER SIEMENS having discovered the applicability of gutta-percha as a covering for the wires, he was able to convince the authorities about the advantage of laying telegraphic wires underground. He was entrusted with much work of that class. It was then only a step to submarine telegraphy, which was further demonstrated by a trial at Kiel. In the English work of the firm WILLIAM SIEMENS was a sharer, and the extent of his work is seen in the setting up of a manufactory of apparatus in London during the year 1858.

The position of WILLIAM SIEMENS in London was now assured. He could not be called presumptuous when he claimed admission into the Royal Society, for his first qualification was as "the discoverer of a law regarding the expansion of steam by heat, and certain properties of insulating materials." The Council placed him among the selected candidates, and he was elected in June 1862.

His twenty years of labour in England only incited him to new tasks. A great improvement was introduced in the regenerative furnace by an arrangement for decomposing the solid fuel and admitting it into the working chamber in a gaseous form. The first of the improved furnaces brought about a saving of 50 per cent. in fuel. The last lecture delivered by FARADAY was upon them. Apart from economy, the furnaces are considered indispensable on account of the intense heat which can be attained within them. The furnaces led to the SIEMENS process for producing steel, for which the first patent was taken out in August 1867. According to it steel could be produced directly from the ore, or by melting cast-iron and scrap-iron, or scrap-steel or blooms of puddled steel and iron in a reverberatory furnace, or the steel may be produced by both processes conjointly. WILLIAM demonstrated its worth by offering to convert the old rolled iron rails of the London and North-Western Company into ingots fit to make good steel rails. He was successful; and again, with the rails of the Great Western Company. Mr. POLE considers that WILLIAM SIEMENS should have stopped there and left the development of the process to others. But, with the aid of a few friends, steel works were established at Landore for the production of SIEMENS steel. Once more the inventor encountered failure. The shareholders, says Mr. POLE, had to submit to great losses, Dr. SIEMENS himself, who made every self-sacrifice to carry on the works, being the principal sufferer.

In 1863 it was found that much larger works were needed for electric work, and plans were prepared for new buildings at Charlton, near Woolwich. In that place WILLIAM SIEMENS was able to display marvellous resource. Mr. POLE suggests the shrewdness of the British workman in taking the measure of an employer or superintendent,



when he relates that it was a saying at Charlton, "that as soon as any particular problem had been given up by everybody else, it had only to be taken to Mr. WILLIAM SIEMENS for him to suggest half a dozen ways of solving it, two of which would be complicated and impracticable, two difficult, and two perfectly satisfactory." It was a summary of character that could not be surpassed. The Charlton works were of great use to WILLIAM SIEMENS in affording him opportunities for experimenting on a grand scale.

The rise of electric lighting offered a new field for the skill of the brothers, and they were as fortunate in it as in other applications of electricity. WILLIAM was concerned in the laying of some of the ocean telegraphs, and, indeed, the loyalty which marked the relations of the brothers was never abated. The position attained by them was not due entirely to their exertions as individuals.

In the latter years of his life WILLIAM SIEMENS was fortunately able to divert some of his thoughts from business. He was engrossed with practice for so long a time as to induce many people, and himself also, to be oblivious of his talent for considering questions in the philosophy of science. In spite of all his losses he could count his profits by hundreds of thousands of pounds, and he might therefore sacrifice some hours for the public good without suffering remorse. He was never likely to forget his works or to abandon profits, but it was plain that if WILLIAM SIEMENS lived, he must have given thought to many things which could not increase his banking account. He felt that he was about to be recognised as an English worthy, and he would be as loyal as if we could claim him as a native. His interest in technical education revealed the breadth of his views and the spirit in which he would judge social problems. England is a loser by his death, for no other man is likely to have so wide an experience in practical science, or could be a better illustration of GOETHE'S wisdom when he advocated an early initiation into the business of life:—"Man kann einem jungen Menschen keine grössere Wohlthat erweisen als wenn man ihn zeitig in die Bestimmung seines Lebens einweiht." The success of the Brothers SIEMENS will be always evidence of the advantage of a right system of technical education. Without egotism, WILLIAM SIEMENS could have pointed to himself as an example of the kind of leader which must be produced if England is to hold her own in the industrial competitions of the future; but the record of his life must now serve as a substitute, and the book by Mr. POLE should receive the careful attention of all who have a desire that England may preserve her position in the world.

#### THE RHIND LECTURES ON ARCHÆOLOGY.

THE third lecture of the course on the Lake Dwellings of Europe, by Dr. Robert Munro, related to the pile dwellings of Italy. The first described were the settlements on Lake Varese, the chief of which is situated on an island known as the Isola Camilla, which is about three acres in extent. Excavations made had resulted in the discovery that the island itself was a large crannog. The remains found in the Varese settlements showed that the series belonged to the bronze age. At one—Bodio—about 200 small silver coins of the Roman Republic had been found, and here too there was a remarkable find of arrow-heads. The stations at Lagozza and Polada, near Milan, were next dealt with. The remains found seemed to indicate that Lagozza came to an end by burning. One peculiarity about this settlement was, that not a single article made of bone or horn had been found, neither was there any trace discovered of any implement used in fishing or hunting. Three arrow-heads were, it is true, got near the place, but their authenticity was doubtful. From these facts it was suggested that the ancient inhabitants of the pile dwellings of Lagozza were vegetarians. Here was unearthed a wooden comb with teeth on one side—the only specimen of the kind found in the lake dwellings of Italy. At Polada, which is situated in a valley between Venice and Milan, the settlement was particularly rich in industrial remains. The pottery, which was all hand-made, was of an interesting kind, the arrow points were well formed, and among a find of 100 flint saws was one in which four separate flints were placed end on in a wooden grooved case, and held in position by asphalt. At one end of the handle was a hole, apparently for carrying the saw; at the other was a long horn-like termination which turned off at right angles to the saws. From the manner in which the implement was set it was concluded that the people

who used it must have been left-handed. The osseous remains found included part of a human skull, which, however, had no distinctive features, and the skull of a cat. There was also found a very fine dagger of bronze, set in a handle of bone, and a curiously perforated tube-like piece of pottery, which, it had been supposed, was used for making cheese. The interesting series of deposits known as the Terra Mare deposits, which had attracted the attention for a good many years of Italian archæologists, were next considered. The mounds in question occur in the provinces of Palma, Reggio, and Modena, and were sometimes about 20 feet in height. For a long time past they had been dug into by agriculturists, who discovered that the peculiar soil of which they were composed formed an excellent manure. In these diggings Roman coins, pieces of ancient pottery, the remains of domestic animals, and even human bones had been found, but little heed was paid to them. The old idea was that these mounds were the cemeteries of successive races, and some countenance was lent to this idea by the fact that in not a few instances the mounds were crowned by a modern church or convent around which interments were made. At Castione, in Palma, a mound which had been excavated there would probably cover about two acres. The discovery of the Swiss lake dwellings turned afresh the attention of Italian archæologists to the Terra Mare deposits, and the finding of piles led some to associate them with the same period. It came to be seen that the mounds had been the dwellings of the living and not of the dead, and the hypothesis adopted by some was that they had been artificial ponds into which piles had been driven, and dwellings erected upon them. But the weak point of this theory was that many of these mounds were far above the beds of the adjoining streams, and that water could not have been raised to them except by hydraulic power. A recent Government commission, which had excavated the mound at Castione, had, he thought, settled the difficulty. These ancient dwellers in the Italian plains had proceeded in this way. They dug a ditch round the place they meant to occupy, and the excavated earth became an enclosing wall on the inner side of the ditch. On the inner face of this wall they drove piles of wood so as to form small hollow squares, the interior of which was filled with sand and gravel. In the space between the two sets of piles they drove short piles, and on the top constructed an open platform, upon which they built their huts. Instead of cleaning, the debris and drainage was allowed to drop underneath, with the rain-water mixed, for the wall being of clay, it could not escape—and so the sedimentary-like character of the layers of different coloured earths which were found in the mounds was accounted for. When the space beneath the huts was filled up with rubbish, the platform was set fire to, and the huts consumed. This was cleaning with a vengeance, but the layers of black charcoal-like substance found seemed to favour the view that this method was adopted, and the inhabitants raising their piles and constructing a higher platform on the top of the old, lived as before until the second space was filled up. The same operation was then repeated, and so the mounds grew, and in some cases they had traces of as many as six or seven of these platforms in a mound. About a hundred of such mounds were known to exist in the provinces named, and they had also occurred in the valley of the Po, but the silting up of the valley by the river, which overflowed its banks yearly, had destroyed most of the traces of them. In the true Terra Mare deposits only articles of the bronze age were found. The Roman remains got were all in the upper portions of the mound.

In his fourth lecture Dr. Munro first treated of the settlements on Lake Neuchâtel, and described that at La Tène, or "The Shallows," situated near to the Gros Moos, through which a channel conducts the water to Lake Bienné. From the investigations made, it appeared that La Tène had originally been an island between two channels of the river Thiele, and it belonged exclusively to the iron age. Not a single trace of any remains belonging to any of the previous ages had been found. The excavations conducted along the filled-up channel of the river had disclosed the remains both of wooden houses and bridges. The section of the cutting gave first a bed of water-worn gravel and sand 3 or 4 feet to as many yards in depth. Beneath that was a blackish mossy bed, which was superimposed on the ancient lake sediment. It was in this mossy deposit, and sometimes buried in it, that the objects characteristic of La Tène were found. The remains found included weapons, implements, ornaments and coins, and from the character of some of these it was conjectured that the station had been a military stronghold of the ancient Helvetians, and that it had been subsequently occupied by the Romans. After a description of a Merovingian settlement on Lake Paladru, which had existed until the ninth or tenth century, Dr. Munro next considered a find which had been made at Maestricht, in connection with a railway cutting made in that locality. No upright piles were found; but the dwellings, which, it was supposed, were the lodges of the hunters, had affinity with the lake dwellings in other places. One of the remains discovered was a portion of a human



skull. There was more than ordinary interest, said the lecturer, attaching to this find, as it was near Maestricht that the celebrated Crahay jaw (now in the Leyden Museum), which was described by Sir Charles Lyell in his "Antiquity of Man" as coeval with a mammoth tusk, was found. The present skull was found from 3½ to 4 mètres below the surface layer of a gravel bed, on which the wooden structure of the ancient dwellings reposed. Mr. Ubaghs found that the two relics were identical as to their patina, consistency of bone, and the position of material in which they were found, traces of which still adhered to them, and he came to the prosaic conclusion that the two belonged to the Maestricht crannog. M. Kerkhoff denounced Sir Charles Lyell for mistakes he had made regarding the relative position of the Crahay jaw and the mammoth tusk. According to Sir Charles Lyell, the tusk was found six yards removed from the human jaw in horizontal distance. It turned out to be neither the fact nor in accordance with the Crahay jaw report, which stated that the former was 7.50 mètres deeper than the tusk. The stone age dwellings at Wismar were next referred to, and the mixed character of the settlements in Germany were commented on. The concluding portion of the lecture was taken up with an interesting description of the Terpen Mounds in Friesland, Holland, which had been found to be identically the same in character as the Terra Mare deposits in Italy. About 150 of such mounds were scattered over Friesland, and, as in Italy, the peculiar soil of which they are made up was largely used by agriculturists as manure. Large quantities of remains were found in these mounds—some of a very mixed character. One which he described from personal observation in Aalsum was about 400 yards in diameter and 20 feet high. A canal had been cut up to it, and from it barges were loaded with the earth for transport to other places as manure. Great care was taken by the diggers and loaders of the remains, which could not be sold until they had been seen by the curator of the museum. Among other curiosities found in the mounds were curiously-shaped narrow conical barrels, with iron hoops, from six to seven feet in length; hens' eggs, with the shells entire. The antiquities included loom weights, spindle whorls, vessels of coarse pottery, Roman fibula, beads, portions of Roman statues, and Samian ware.

The fifth Rhind lecture was devoted to the lake dwellings of Great Britain and Ireland, and at the outset Dr. Munro stated the circumstances of discovery of these lacustrine abodes. It was the discoveries which had been made on the Continent which had first drawn attention to similar remains in this country, and although as far back as 1812 Mr. John M'Kinlay had observed what were supposed to be the remains of a crannog in the island of Bute, it was 1857 before the subject was brought under the notice of the Society of Antiquaries. In that way inquiry had been stimulated, and various remains had been brought to light, chief among which Dr. Munro mentioned the crannogs at Dowalton, Lochlee, Buston, and Lochspouts—all in the counties of Ayr and Wigtown. Similarly he described the progress of discovery south of the Border, mentioning, at the same time, as a singular circumstance, that it was on the crannogs in Ayr and Wigtown that archaeologists were almost entirely dependent for their facts. All the wooden islands hitherto examined in Scotland appeared to have been built on a uniform plan, the main object of which was to give stability to the island, to afford fixed points on its surface, and to give a base for the buildings which were erected upon it. The topographical requirements seemed to have been a small marshy lake, secluded in the primeval forest. As to the manner of construction, it was obvious that heavy substances, such as stones and earth, would have been inadmissible, owing to the soft bottom of the loch. Accordingly, the general plan was to construct an island of fascines, stems of trees, and brushwood, laid transversely and mingled with stones and earth, the mass being pinned together towards the margin by a series of stockades, which were firmly united by intertwining branches, or in the more elegantly constructed crannogs by horizontal beams, with morticed holes to receive the uprights. These horizontal beams were arranged in two ways—some laid along the circumference, and bound together by all the uprights in a circle, while others took a radial position. Frequently a wooden gangway stretched to the shore, and these were sometimes ingeniously constructed. The great value of the investigations, however, lay in the great quantity and variety of the remains of human industry which had been brought to light in the investigation of these crannogs, and of these Dr. Munro went on to give some account. At the Lochlee crannog these had included glass beads, regarding which Dr. Munro had come to the conclusion that they were entirely Roman. There were also bronze fibulae, certainly of Roman origin; bronze leaf-shaped spear heads, which were very rare; querns, which were numerous in the British lake dwellings as distinguished from those investigated on the Continent. At Lochspouts there had been found a bridle-bit, a cross enclosed in a circle of metal, along with a crystal found in the same crannog,

supposed to be of Christian origin, and the only objects of the kind found in any of these dwellings. At Buston, gold rings had been found, and a portion of a curious lock; and at Dowalton the discoveries had included finely-shaped vessels of Roman origin, shoes, also apparently of Roman origin, beads, ornamented combs, pins, &c. Along with these there had been found at every one of the crannogs numerous weapons, domestic and other utensils; and Dr. Munro went on to consider what information could be gleaned from the remains regarding the original inhabitants of these dwellings. There could be no doubt, he said, that the inhabitants of these crannogs had come into contact with the Romans, although in the remains the Celtic characteristics were strongly developed, and the ornamentation was of a kind peculiar to Celtic art. The nature of the remains—mostly of the Domestic kind—were sufficiently indicative of the peaceful character of the lake dwellers. Military remains were but feebly represented. That many of the relics were the product of a refined civilisation was not more strange than the circumstances in which they were found. He thought there could be but one hypothesis, namely, that the lake dwellings in the south-west of Scotland were post-Roman, and had been constructed by the Celtic inhabitants as a means of protection when, from the frequent withdrawal of the Roman soldiers, they were left to defend themselves from the Angles on the east and the Picts and Scots on the north and west. Their military tactics would assume more the character of defence, and in order to escape from the marauding inroads of these tribes, experience had taught them the value of that mode of refuge. With their complete subjugation the function of these lake dwellings had ended. Dr. Munro passed to discuss in the same way the existence and discovery of lake dwellings in Ireland, commencing with the first notice of these after the discovery of the crannog at Lagore, Westmeath, in 1839, which archaeologists had assigned to a date in the tenth century. He showed how far subsequent investigation had disclosed the existence of these in Ireland, so that in 1885 the total number was stated to be 221. He showed how these were similar in structure and character to the Scottish crannog, and then went on to discuss the general question as to the prevalence of crannogs among the Celtic tribes in Britain, and the question whether they were of Celtic invention and the outcome of its peculiar civilisation. Speaking generally, he thought they were fragments of a wider custom, and that the system was derived from the Swiss lake dwellers, whose admirable system must have attracted the attention of the surrounding races. The early Celtic immigrants into Britain must have been acquainted with the advantages of these lake dwellings—a knowledge which they retained long after the system had fallen into desuetude on the Continent. It was as defenders, not as conquerors, that the Celtic inhabitants of Scotland and Ireland constructed their lake dwellings; and as to the structural difference between the pile dwelling which was common on the Continent, and the fascine dwelling which prevailed in Britain, he pointed to the evidence of both systems having been known both on the Continent and in Britain, while in Britain the artificial islands supplied more readily, and with less labour, the requisite stability. He saw no *prima facie* improbability against the hypothesis that they were the outcome of a system which was developed in Central Europe.

#### "MADE-UP ROADS."

THE vagueness which characterises the common phrase "made up" as applied to roads was exemplified in a case that was heard by Mr. Justice North on Monday. A piece of land situate about a mile from the Worcester Park Station, containing over twenty acres, was sold as building land for 1,500*l.*, or 7*o**l.* an acre. The descriptive particulars stated that a new road over the estate was made up and sewered. The expression "made up" was used in more than one place in reference to the road, and the road was also stated to be in continuation of Chedington Avenue, an existing road. The road across the property sold was about 350 yards in length. Some ballast had been put upon it. It had a path, but it had not been metalled. Chedington Avenue was gravelled, with a foundation of chalk instead of ballast. The sale was made shortly after an abortive auction under conditions of sale prepared for the auction. The purchaser had not seen the property when he bought it. There was a condition that a misdescription should not annul the sale, but entitle the purchaser to compensation. The vendors contended that there was no misdescription, and refused to allow any compensation. The purchaser, on the other hand, insisted on the right to have the road put in such a condition that it would be ready for the local authority to take it over, which, he contended, included kerbing and channelling, with two paths, or to have the amount of the cost of doing the work allowed him.

Mr. Justice North, in examining the evidence as to the technical meaning of the expression "made up," said that he



had no less than five different views presented to him by the surveyors who had made affidavits, varying from the view of a witness on the part of the vendors, who considered that a road was made up when it had been put in the state in which this road was, to the view of a witness on the part of the purchaser that the words implied that the road was in a fit state to be taken over by the local authority. His lordship pointed out that such a description as the last did not afford a clear guide on which to act, for the requirements of different local authorities were different. He was of opinion that there was no general meaning of the expression which the Court could adopt. But looking at the construction of the whole particulars, he came to the conclusion that the meaning of the words as used in the description of the property, taken with their context, amounted to a statement that the road was made up in the same sense that Chedington Avenue was. That being so, there remained the question of what compensation the purchaser was entitled to. He claimed to be allowed the whole sum that it would cost to put it in the state it was represented to be in. His lordship was of opinion that that was not so. The vendors might, if they pleased, put the road in the state in which it was represented to be, and thus satisfy their contract; but they were not bound to do so, and he did not consider that was the measure of the compensation they were bound to pay. In his opinion the measure was the difference of the price agreed to be given and the decreased value in consequence of the road not being made up. It might be that because the land was to be used either as pasture or building land in the one case the road would not be required, or in the other, if made up, it might be so cut up by building operations before it was taken over that it would require to be remade. His lordship directed an inquiry at Chambers to ascertain the damages sustained by the purchaser.

### TESSERÆ.

Truth in Architecture.

S. SMIRKE.

PAINTING and sculpture are so fortunate as to have in nature a standard of excellence for ever before them, a frequent recurrence to which keeps them on their own true course. But architecture is less able to draw her inspirations from that pure source: her wants are too artificial; she is too dependent on the requirements of man to enable her to look implicitly up to nature. But architecture still has a ruling principle, which is truth. From Vitruvius downwards this has ever been taught, although in practice it has often been grievously disregarded. There is an honest simplicity—a plain manliness—about truth which wins our regard, whether in ethics or æsthetics. But whilst we recognise truthfulness as a cardinal virtue in our art, as well as in morals, we must take care not to allow that analogy to carry us too far. We often meet in the practice of our art with necessities utterly inconsistent with beauty. Hard lines, unsightly angles, heavy, graceless forms, imposed on us by structural requirements; it would be a mischievous error to suppose that, because in our social conduct there should be no deception nor concealment whatever, we are therefore bound to expose to view these mechanical deformities from which we cannot escape; whilst to depart from the form that is mechanically the right form, only to make it more agreeable to the eye, would be a still graver error. That there should be a politic concealment sometimes studiously resorted to, some ingenious art practised occasionally—such, for example, as the concealed buttresses and the hidden ties and props common in old buildings—seems therefore to be an unavoidable condition of our calling. In the most natural-looking schools nature is not, and never has been, copied with a stern adherence to exact truth. The simplest leaf requires treatment to fit it for the purpose of decoration, and treatment implies some modification or humouring of form or of colour; in short, some departure from nature and consequently from truth. Nearly allied to this is another principle of our art, which although by no means universally acted upon, yet justly claims our most respectful submission. We should have a care how we introduce into our design anything which does not serve some good purpose. I do not mean that mere utility would justify a deformity, nor do I mean that every architectural feature in our design should be a structural necessity; but that, although it may not be to add strength or to afford support, it should at least have its appropriate purpose: a valid reason should be assignable for it; some good end must be sought to be attained by it; some offensive angle or feature to be removed; some unsightly blank to be relieved; some monotony of line to be broken; some needed light or shadow to be introduced; some discord in form or colour to be allayed.

### Cruciform Churches.

A. H. DIDRON.

In the West the churches are usually in the form of the Latin cross of unequal parts, the apex and arms being shorter

than the shaft or trunk. The foot or shaft forms the longitudinal nave, the arms form the transept or transversal nave, the apex forms the choir. In the Middle Ages the choir was shorter and the nave longer. In the basilicas of Constantine the transverse nave (called the transepts or cross aisles) cuts the longitudinal nave immediately adjoining the apsis, it leaves no room for the choir. In the thirteenth century the choir lengthens and forces the transept towards the west. There are even some churches in which the transverse nave is nearer to the portal than to the apsis, so that it is still a Latin cross, the divisions being unequal, and the cross aisle cutting the transverse nave into two unequal portions, but it is a Latin cross reversed, the apex of which is longer than the pedestal. The church of St. Germain l'Auxerrois at Paris is of this form; from the portal to the transept the nave is four widths in length, from the transept to the bottom of the church the distance is nine widths; the top, which ought to be much longer, is really shorter than the bottom: the arms are short, as is usual in the Latin cross, only occupying three widths between them. Many of the English cathedral churches have a form which is neither that of the Latin cross nor of the Greek cross, nor even that of the simple tau. These singular edifices are divided not by one transept but by two. The first cuts the longitudinal nave in half; the western or inferior end forms the nave properly speaking, and the eastern end forms the apsis of the church; this apsis itself is divided by a second transept, usually shorter than the first. On this side, viz., from the first to the second transept, is the choir; on the other, viz., from the second transept to the bottom of the church, is the sanctuary. The cathedrals at Salisbury, Lincoln, Beverley, Rochester, and Worcester are of this character. Let a figure be drawn of the Cross of Christ, with a long and wide label attached to it bearing the inscription "Jesus of Nazareth, King of the Jews." This label, as it were, is adopted in English churches, and forms the eastern transept, that which divides the top of the cross into two parts; then comes the usual cross aisle or transept, on which the arms of Christ were extended. This is derived from the Cross of Lorraine, the Cross of the Knights Hospitallers, and from that which denotes at present the archiepiscopal dignity, it is the double cross; it seems to be borrowed from Greece, for we meet with it frequently in Attica, in the Morea, and at Mount Athos. The designs for churches in the form of a cross were often revealed in visions. In the night an angel appeared to a sleeping saint, perhaps to a bishop, and made known to him the form of a monument which was to be erected by the command of God; immediately the work was put in hand according to the model seen in the dream. Sometimes bright lines were observed in the sky, tracing on the clouds the form of the church to be erected. In this way Constantine caused his Labarum to be executed in the form of that which he had seen traced in lines of fire in the sky, and according to which luminous design the edifice was erected. Sometimes the plan and form of a basilica might be discovered traced with drops of dew on the dry ground, at another time it was the snow which indicated the spot and marked the form in which the walls should rise. Thus the French abbey and church of St. Michael in the department de la Manche, and the Italian church St. Michael at Gargano were traced upon the earth by the steps of a bull.

### Fifteenth-century Glass.

T. GAMBIER PARRY.

The improvements in the arts of painting during the fifteenth century were the first poison-drops which ultimately ruined the art applied to glass. Up to the end of the fourteenth century little harm was done. Shadows were used in the draperies, but they were used as they ought to be—for glass. The folds were marked, as in the previous style, by strong and fine lines, the shadows in the fewest possible places so darkened as to save the rest from weakness. The points in the figure composition and the relief of the parts were maintained in the genuine spirit of glass-painting, by the contrast of colours and the shapes of the pieces, and pre-eminently by the reckless boldness of the leading. Too much praise cannot be bestowed on the care that was lavished on the ornamental as distinguished from the pictorial parts. It is a great mistake to suppose that a high and refined sense of beauty can only be shown in figure-painting. Ornamentation is to art what the varieties in form and tint of leaves and flowers are to nature, and often expressive of its great beauty. It is a branch of art never despised by the really great artist. The principle of an arabesque, if only used in the right place, is admirable. The Early Gothic and Norman arabesques were magnificent. There is just in them that legitimate place for wild fancy which is wanted somewhere—a sort of safety-valve for fun which must break out somewhere, and might otherwise become dangerous. About the middle of the fifteenth century the treatment of pictures in glass became more and more relaxed. The artists had hitherto been guided by the safe principle of deference to the architecture of which their work formed a part. After that time the architect's design seemed to be beneath the notice of



the painter's condescension. He spread his pictures over the whole window-space, regardless of all obstacles. A little later than this a magnificent style of glass-painting was developed in Italy. Glass was treated pictorially indeed; but, like most genuine artists as they were, the Italian designers of those pictures felt intuitively that the compositions and resources of other styles were unsuitable for glass. So they went in for light and colour like men; and designed, for breadth of contrast and vigour of effect, figures, architecture, fruit, flowers, animals; and then leaded them altogether, regardless of atmospheric effects and perspective, and with an equality of colour throughout and relief in the detail just enough to save all the objects from confusion. The effect was the most powerful that glass could produce. It was flat, architectural, and grand in the extreme. The success of those windows consisted in this, that their designers were, first of all, consummate artists themselves, and then that they had the genius and wit to seize the true and complete idea of the materials they had to work with. There was the last blaze of that fine art for many a long year. Their successors adopted a new system by painting upon glass with enamel colours. The result was the rapid decline of the art. They would paint. The art of glass, therefore, was no more.

#### Park Roads and Garden Walks.

J. HUGHES.

In gentlemen's parks, gardens, and pleasure grounds it is exceedingly difficult, if not impracticable, to make ornamental carriage roads or private walks by the old system of laying on loose gravel or broken stones; for whatever pains be taken in selecting the best kind of gravel, and afterwards in forming and rolling, worms will find their way through and destroy it by depositing a portion of adhesive earth wherever they work to the surface; and these deposits are so numerous, particularly in the autumn and through the winter and spring of the year, that in the case of the carriage-roads this earthy material first adheres to the rims of the wheels, and then again sticking to the gravel, tears up the whole surface to the entire destruction of the road. Garden walks from this cause frequently cannot be traversed with any pleasure: the dirt adheres to the feet, and is so exceedingly unpleasant that such roads and walks, instead of having a hard, clean, and smooth surface, become dirty and unsightly in the extreme. I would recommend in such places that the roads and paths should uniformly be made with a concrete bottom of only a very few inches in thickness—say three inches for carriage-roads and two inches for paths, and with a slight covering of binding gravel on the top. This system, I think, would effectually prevent the roads from being destroyed in the manner I have described; for, independent of the antipathy which the worm, and I may add every description of insect, entertains against lime, and notwithstanding their capabilities of boring, they never could penetrate half an inch into the concrete. As an instance of the perseverance of worms and the mischiefs they sometimes occasion, I have myself, during a very dry hot summer, met with them in canal excavations, four feet below the surface, in hard clay; and I have known them penetrate afterwards out of this depth, and through three feet of clay puddle, thereby actually occasioning leakage in the canal.

#### Italian Gothic.

W. BURGESS.

Much—very much—is to be learnt from Italian Mediæval architecture, but its details by no means suit it either for our climate or materials; and although certain things may look exceedingly well executed in marble in the half-Oriental town of Venice, it hardly follows that it should do so executed in soft stone, and placed in a street of some provincial town. So much is this the case that I am half afraid that nearly all our faults in modern architecture may be traced to the misuse of Italian examples. Of course, Italy is a delightful country to study in, and replete with all sorts of associations, and it is far more pleasant to make a tour which shall include Florence, Venice, and Rome, than to spend week after week in a dull town like Chartres. When, therefore, it was found that Mediæval art could be studied in Italy, students of the new school flocked thither, and, wishing to bring back telling sketches (the curse of architecture), copied the details, which ought not to have been copied at all, forgetting to study the great broad masses, the strong unchamfered angles, the beautiful figure sculpture, or the wonderful frescoes. It may be asked, What has an architect to do with sculpture or frescoes? I repeat that, unless he can give small drawings sufficient to show what groups or figures he wants, and what those figures are to do, he only knows one-half of his profession, and has only half a claim to be considered an artist. The same with regard to the frescoes: he should know how to dispose of them in the building; how to separate them by bands; how to allow for height of situation; and, in fact, be able to give every assistance to the painter actually employed in their execution; and for all this he must know how to draw the figure tolerably. But if

he has studied these things, and can draw the figure tolerably, he will be able to make the building interest the spectator, and tell wondrous stories without a moulding or piece of foliage in his architecture. It was to this that Mr. Ruskin alluded when he said that a square yard of stone was sufficient for any man to show what was in him; and, so far as I may be permitted to say so to such an authority, I consider Mr. Ruskin to be thoroughly in the right.

#### Formation of Granite.

SIR C. LYELL.

The study of late years of the constituent parts of granite has led to the conclusion that their consolidation has taken place at temperatures far below those formerly supposed to be indispensable. Gustav Rose has pointed out that the quartz of granite has the specific gravity of 2.6, which characterises silica when it is precipitated from a liquid solvent, and not that inferior density, namely 2.3, which belongs to it when it cools and solidifies in the dry way from a state of fusion. But some geologists, when made aware of the intervention on a large scale of water in the formation of the component minerals of the granitic and volcanic rocks, appear of late years to have been too much disposed to dispense with intense heat when accounting for the formation of the crystalline and unstratified rocks. As water in a state of solid combination enters largely into the aluminous and some other minerals, and therefore plays no small part in the composition of the earth's crust, it follows that, when rocks are melted, water must be present, independently of the supplies of rain-water and sea-water which find their way into the regions of subterranean heat. But the existence of water under great pressure affords no argument against our attributing an excessively high temperature to the mass with which it is mixed up. Still less does the point to which the melted matter must be cooled down, before it consolidates or crystallises into lava or granite, afford any test of the degree of heat which the same matter must have acquired when it was melted and made to form lakes and seas in the interior of the earth's crust.

#### Roman Bricks.

J. TURNER.

They had several sizes of bricks, one of which they called bipeda, or 2 Roman feet long; another, didoron, about 6 inches broad and 1 foot long. In Palladio's time artificial stone or bricks were called quadrels, and, according to Pliny, those chiefly used were a foot and a half long and a foot broad, which also agrees with the size mentioned by Vitruvius, though Alberti says, "We see in some of their buildings, and especially in their arches, bricks 2 feet every way." He afterwards remarks that in several of their structures, particularly in the Appian way, were several different sorts of bricks, some smaller and some bigger, and he mentions having seen some not longer than 6 inches nor broader than 3 inches, and 1 inch thick, but these were chiefly used in their pavements and edgeways. Palladio observes, bricks may be made bigger or smaller, according to the nature and quality of the building, and the use to which they are designed. They also made bricks of other forms than those enumerated. "I am best pleased," says Alberti, "with their triangular ones, which they made in this manner; they made one large brick a foot square and an inch and a half thick; while it was fresh they cut it in two lines crossways from one angle to the other, which divided it into four equal triangles. These bricks had the following advantages: they took up less clay; they were easier to dispose of in the kiln and to take out again; they were more convenient for working, because the bricklayer could hold four of them with one hand, and with a small stroke divide the one from the other; when placed in the wall they appeared like complete bricks of a foot long. Some of these bricks are to be seen in the walls of Rome, particularly that part built by the Emperor Aurelian." Hope speaks of bricks being made in the form of lozenges, and some were even moulded, or were, after being cemented together in regular layers, carved out into every variety of architectural ornament, as we see at Rome in the remains of the Amphitheatrum Castrense, of the temple of the god Ridiculus, and in another building, where even the capital and foliage of the Corinthian order are cut out of solid masses of brickwork. With regard to the method of manufacture, we learn from Vitruvius that a red or chalky white earth, of a strong sandy nature, mixed with straw, was considered the best, on account of its not being heavy, which it was thought better to dig in the autumn, and make it into brick early in the spring; after they were moulded they were placed in the shade to dry, and, when made properly, they were not put into the kiln for two years afterwards. Alberti says the ancients mixed marble with the red earth; and it was also customary for the Romans as well as the Egyptians to inscribe and impress their bricks with various devices. In the bigger sort holes were left, that they might dry and burn better.



## NOTES AND COMMENTS.

ACCORDING to the diary of JOHN THOMPSON, of which a portion appears in an American magazine, we must henceforth recognise CARLYLE as one of the admirers of WREN as an architect. One night in October 1864, CARLYLE walked with THOMPSON from Chelsea to Pimlico. "On the way," says the diarist, "passing Chelsea Hospital, he burst into a tribute to WREN, the architect, of whom he said there was a rare harmony, a sweet veracity, in all his work." There was a limit to CARLYLE'S wanderings, for if he had gone so far as to behold the outside of St. Paul's, and had ever ventured inside in the daytime, he must have known that the sweet veracity could at times become sweet shamming. The strange thing in the passage is the assumption of the office of art critic by CARLYLE. At one time he maintained that we ought to be silent about the qualities of a work of art. When he was writing upon WREN some thirty years before, he evaded an estimate of WREN'S St. Paul's as a work of architecture. He cited it as an example of what could be done by a man who was able to wrestle with "the stern brute powers of fact." The virtue was not in the harmony or the veracity of the building, but in the overcoming of foolish unarchitectural bishops, red-tape officials, idle NELL GWYNNE defenders of the faith, mutinous masons, and Nature herself, "who carries her mathematics and architectonics not on the face of her, but deep in the hidden heart of her." It was not the artist, but the brave man who obtained the commendation. CARLYLE may have based his estimate of WREN on the Chelsea Hospital alone, a building where it was difficult to be unvarnished; but, in any case, it is satisfactory to discover that he could condescend to praise an architect's work.

It is a fatality that whatever is done to make life more endurable creates new demands for the exercise of medical skill. Sanitarians, for instance, have been looking forward to the time when gas illumination would be superseded by electric lighting. It is found, however, that the latter has created a new malady, which for the time is known as electric prostration. According to the *Lancet*, several cases are reported from Creusot, in France, the sufferers being the workers in the great factory of the Schneider Company. The light exceeds 100,000 candle-power, and it appears that it is this excess of light, and not the heat, which produces the nervous symptoms. "A painful sensation in the throat, face, and temples is first noticed, then the skin becomes coppery red, and irritation is felt about the eyes; much lacrymation ensues, and these symptoms then disappear, whilst the skin peels off in five days. The effects are comparable to those produced by walking over fresh snow in the sunlight, and may be regarded as a sort of 'sunburning.'" Probably there are causes in Creusot which contribute to the illness. It is not uncommon to find people who work under the electric light for a long time becoming brown, as if they were exposed to the sun's rays; but hitherto it was supposed that the colour was an indication of a favourable atmosphere.

M. GRAU, of Vienna, has discovered a series of portraits in Egyptian tombs, which are in a condition that surprises every one who has seen them. Although they are at least two thousand years old they seem to be as fresh as many more modern works in oil. They are painted in encaustic. Altogether there are about seventy portraits of men and women; some are on wood panels and some on canvas. It might easily be supposed that they are counterfeits by some living artist, but Herr EBERS, the Egyptologist, and Herr MENZEL, the painter, have expressed a belief in the authenticity of the portraits.

THE fifteenth annual competition between the various sketching clubs of London was held on Wednesday, in the rooms of the Royal Society of British Artists in Suffolk Street. The judges were Mr. FRANK DICKSEE, A.R.A., Mr. THOMAS BROCK, A.R.A., and Mr. DAVID MURRAY, A.R.S.A. The award of honour was given to the Heatherley Sketching Club, which gained also six out of the twelve competitions for the excellence of the works submitted.

The first, second, and third prizes for figure fell respectively to TOM TAYLOR, KATE STREET, and M. CLIFFORD, all of the Heatherley. The following awards were also made:—For landscape, E. A. ROWE and E. FOX, of Lambeth Schools, and Miss HOMAN, of the Heatherley. For animals, Miss SOWERBY, of the Union Club. For design, P. KEMP, of Lambeth, and Miss HOMAN, of the Heatherley. For sculpture, J. R. ESSEX, of South Kensington, A. LUCESI, and H. FEHR, of the Royal Academy Schools.

THE Finance Committee of the London School Board have reported that, in consequence of the improvements which are now made in the erection of schools, the loan at present sanctioned by the Education Department is insufficient to cover the cost of schools in London. Among the improvements which cannot come within the 10% per head normal rate are the plastering of walls and class-rooms, cement dados, facing staircases and corridors with glazed bricks, providing a hall for each department, and a drawing class-room in every school, arranging covered playgrounds with a view to their conversion into technical class-rooms or workshops, providing more efficient heating, hot-water apparatus, and extra grates in case of its failure, being now found in each school. In the pupil-teachers' centres (for which a loan of 1% per foot superficial of floor space is allowed) the walls are now plastered, and the walls of staircases and corridors are lined with glazed bricks; and, in addition, there are also provided open and covered gymnasias on the top of the buildings. The Committee recommend that a letter be sent to the Education Department calling attention to the additions, such as the above, which are now a necessity.

As the stage presents a representation of life which is never truthful, we must not wonder if actors, when they pose as historians, should also have a leaning towards fiction. Mr. WILSON BARRETT was invited on Saturday evening to the Art Club in Liverpool. He tore a passion to tatters for the amusement of his hosts, in this style:—"To some kind of men the very word 'art' is in itself offensive. It is a red rag, the slightest flutter of which is madness to the Philistine bull. How he will snort and stamp, foam and fret, rage and roar at the mere sight of it. Like other bulls, he is ready to toss and gore all within his reach, and like them he could not for the life of him tell why. Actors, authors, painters, we are now told, are over-paid, over-praised, over-petted. As if genius was ever over-paid, or could be over-valued! Over-paid, indeed! So said the canons of Parma, who docked one-half the price charged by ANTONIO of Correggio for his glorious fresco—the *Assumption of the Virgin*; docked it one-half, and then added insult to injury by paying that half all in copper. So that, having nearly broken his heart by this want of appreciation, they tried to break his back by the underpayment. Where are these depreciators now? Their very names are forgotten, and only the record of their meanness remains. But CORREGGIO lives still. As he himself expressed it, he had thoughts at the end of his pencil—thoughts which burn as freshly now as they did four centuries ago in the little Tuscan village where he was born, existed, was misunderstood but painted, was despised but painted, starved but painted—painted himself into the hearts of generations to come, living ever, teaching always." The Art Club, it is needless to say, is not an artists' club, and the hosts were on an equality with the guest in their knowledge of the history of Italian painters, for not one of them rose to suggest that all Mr. WILSON BARRETT'S pity was wasted over a narrative that was not true. Liverpool is, we suppose, the only place in England where a man could get excited over the woes of CORREGGIO. The absurdity of the story was demonstrated years ago; and no other proof is needed than the joyousness which is found in CORREGGIO'S pictures. It is evident from them that he was among the happiest of men. Let Mr. WILSON BARRETT put one of the translations of OEHLenschläger's "Correggio" on the stage and we will applaud him in the title rôle, but we beg of him for his own sake to keep from orations on the history of art unless on occasions when he finds himself in the Liverpool Club. There he cannot be too wild in statement.

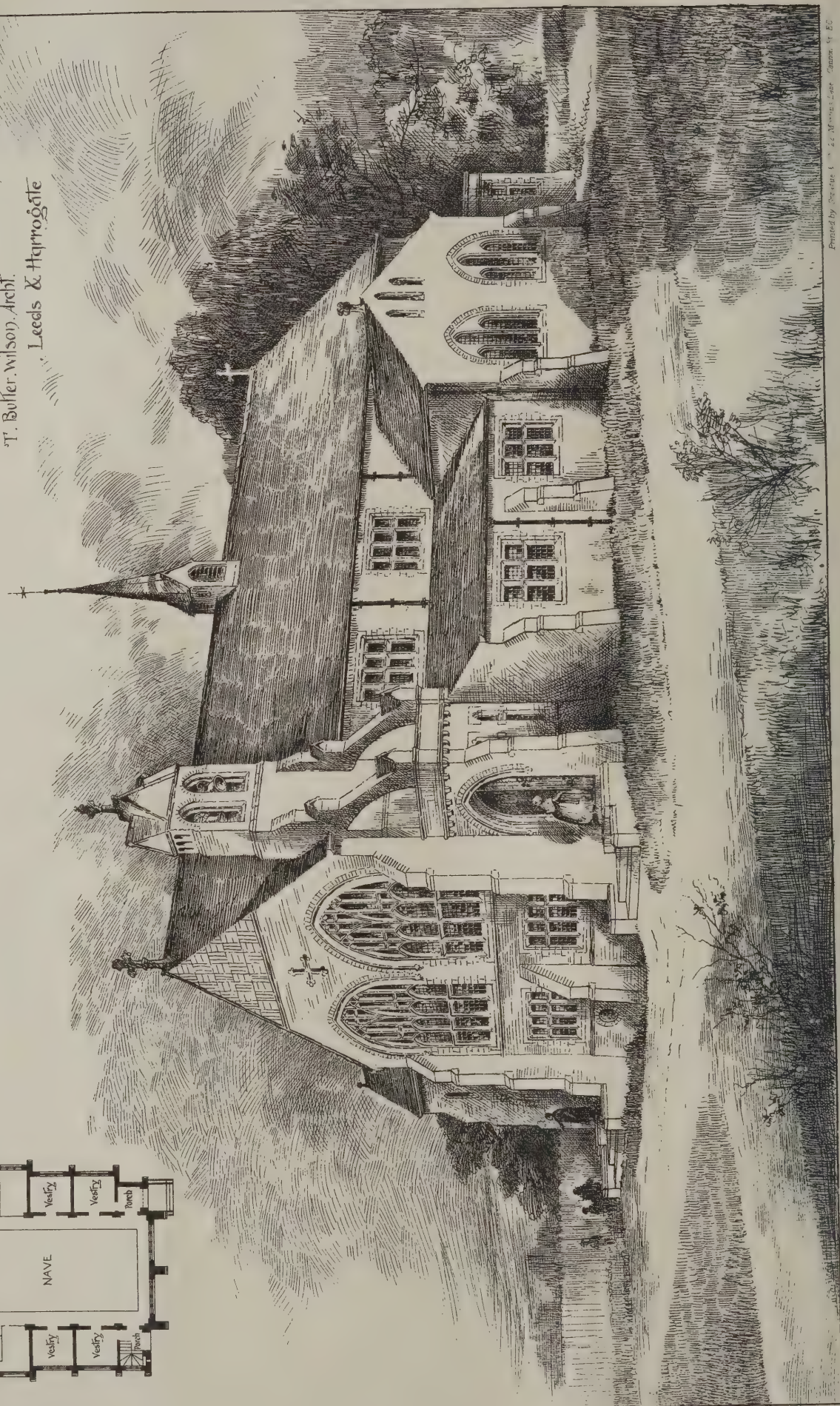
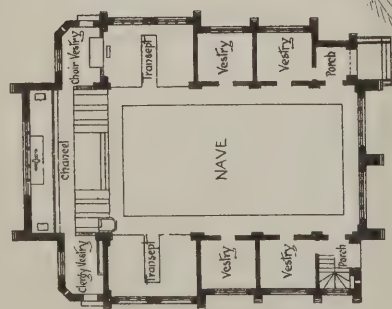






# Mission Church Roundhay Road

T. Butler Wilson, Archt.  
Leeds & Harrogate









The Architect. Nov. 2<sup>nd</sup> 1888.

HOUSE for Wilfrid Meynell Esq

PALACE COURT  
W.

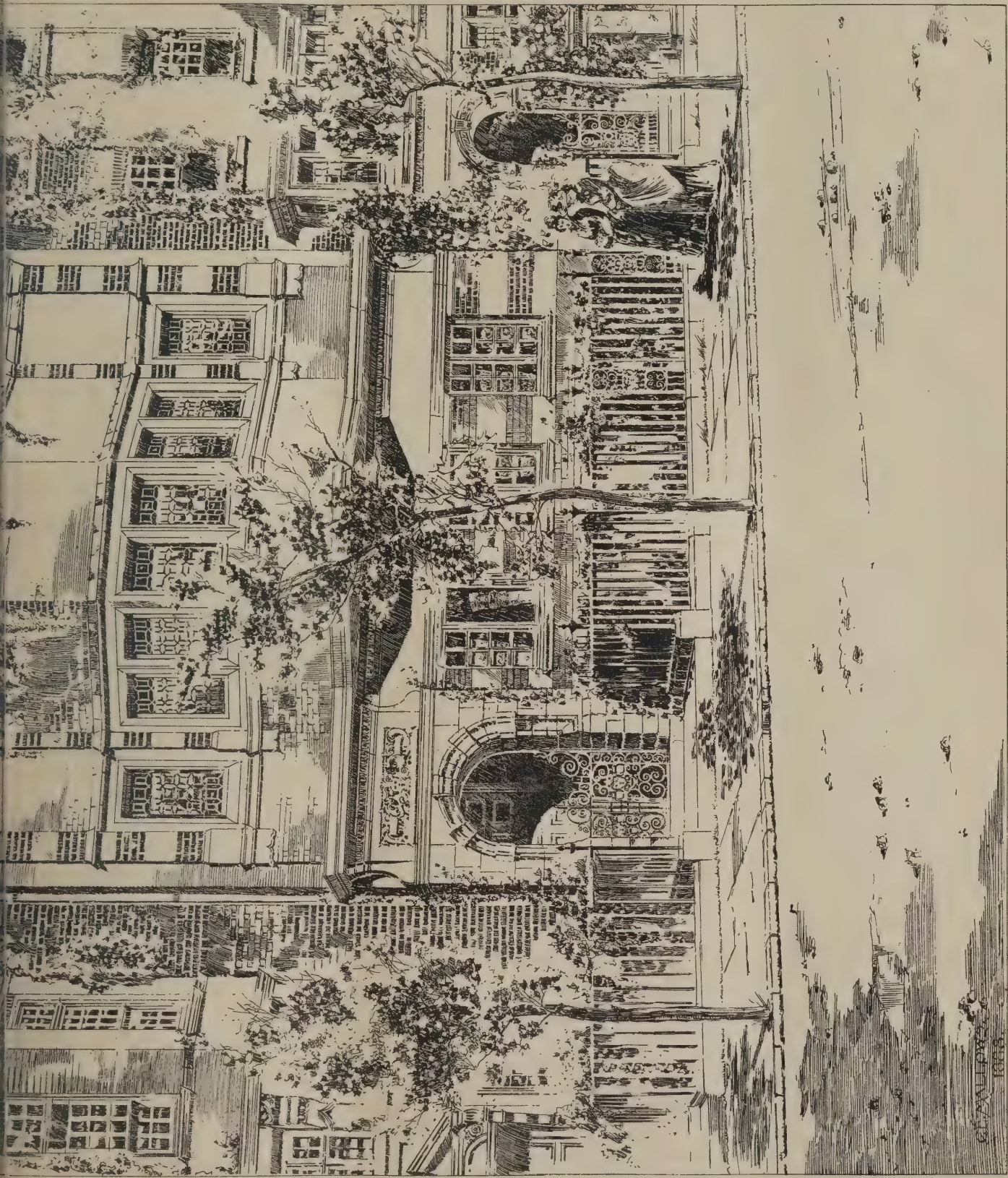
Lawrence Stokes  
Architect.



Ground Plan







Printed by Spang & Co. 22 Marina Lane, Canton St. E.C.









Mission Church.

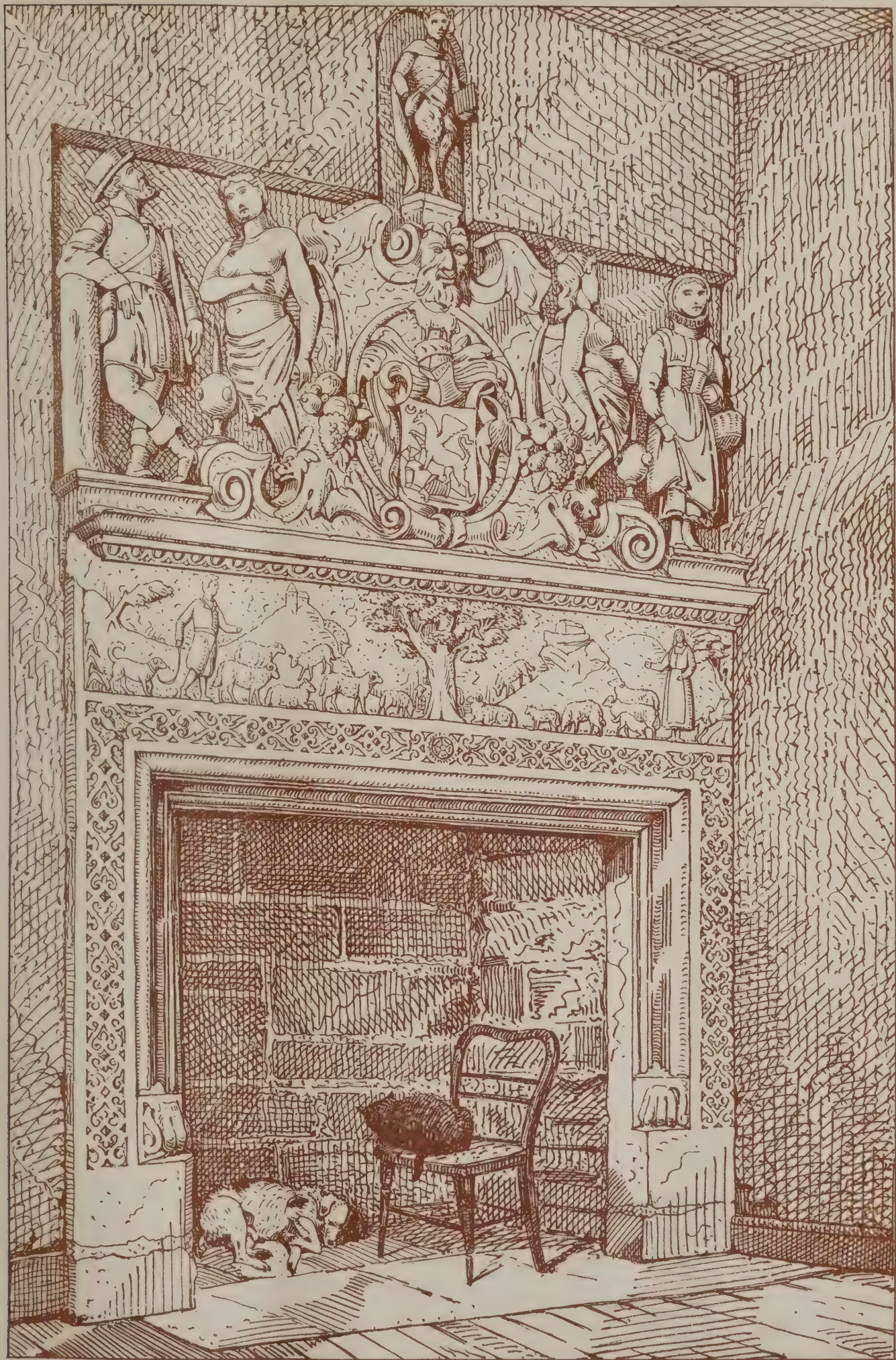
T. Butler Wilson, Archt.  
Leeds & Harrogate

Roundhay Road.









FIRE-PLACE, SWAN INN, KNOTTINGLEY.

DESIGNED BY BERTRAM S. JIMER







# ILLUSTRATIONS.

## ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO 36.—HOUSE, PALACE COURT, KENSINGTON. [LEONARD STOKES.]

MISSION CHURCH, ROUNDHAY ROAD, LEEDS.

WHEN it was decided, in connection with the Leeds Church Extension Society, to form a new church district in Roundhay Road, taken partly from the parishes of St. Clement's, St. Martin's, and St. John's, Newtown, three firms of architects were invited to submit plans, and we publish to-day the designs prepared by Mr. T. BUTLER WILSON, architect, of Leeds and Harrogate. Accommodation is provided for 400 persons, at a cost of 1,000/.

FIREPLACE, SWAN INN, KNOTTINGLEY.

THIS fireplace is 7 feet 10 inches wide and 10 feet 6 inches high. There is uncertainty about its origin. In the centre, it will be observed, is a shield with arms, which should be a clue in the inquiry, but it has failed in that respect. On the top is the god PAN, and the figures at the sides suggest pastoral pursuits. The frieze is of the same character, and in one part a wolf is introduced with a lamb on his back.

The plate is taken from Mr. BULMER'S "Architectural Studies in Yorkshire," which contains representations of valuable fragments of ancient work, besides a map of the county, showing the railway approaches to them. A copy of the volume was accepted by the Queen.

PROPOSED CORN EXCHANGE, ALNWICK.

THE execution of this design is deferred owing to difficulties regarding the acquisition of a site. The design shows the Corn Exchange, which will also be suitable for holding concerts, &c., on the first floor, and shops on the ground floor. The large hall could be readily emptied in case of panic by means of its three staircases, and the building is designed so as to be fireproof throughout. Mr. GEORGE REAVELL, jun., of Alnwick, is the architect.

## ST. MICHAEL'S, COVENTRY.

A MEETING of the Restoration Committee of St. Michael's Church, Coventry, was held in St. Mary's Hall, on Thursday in last week, for the purpose of considering Mr. Scott's amended plan and the estimate for work at the east end of the church, the question of the groining of the tower, and hanging the bells.

The following report by Mr. John O. Scott was read:—  
Gentlemen,—As notice has been given that, at the next meeting of the general committee on Thursday next, the question of ordering the stone groining in the tower will be raised, and as this seems to involve the larger question of the bells, I think it may be useful for me to send a statement of my own opinion and of those which have been expressed by others on this subject. I have before me a copy of a letter written in 1851, by the late Sir Gilbert Scott, to Mr. S. Vale, of Coventry. It is chiefly an appeal for the restoration of the interior of the tower. He writes:—"The whole interior of that magnificent tower was originally open to the church, and visible from within to a height of about a hundred feet from the pavement. The walls are throughout ornamented with niche work, and the windows are as richly moulded within as without, while the whole was closed in overhead with a beautiful groined vaulting of stone, thus forming altogether a most magnificent open lantern, probably nearly (or quite) the finest in England." He goes on to advise the taking-down of the great timber framework, and rehanging the bells in the chamber above the groining, so that the whole of the lantern might be thrown open to the interior of the church.

It requires but little consideration to see that this position for the bells could only be suitable for chiming, as opposed to ringing them in peal, for if the lantern were opened as my father so strongly urged, there could be no ringing chamber at all, the entire height of the tower being open and without any floor, from the stone vaulting to the pavement. My father's recommendation can therefore refer only to chiming the bells, and I will say at once that I am of the same opinion, that if the people of Coventry are satisfied that the bells should in future

be chimed only, I see no reason why they should not be placed above the stone groining.

In reading the reports drawn up by Sir Gilbert Scott, it is important to bear in mind that the shattered condition of the tower and its serious inclination from the perpendicular were not ascertained at that time—nor indeed till the scaffolding was erected four years ago.

That this is so is proved by the fact that my father speaks only of the disintegration of the stone owing to the action of the weather aggravated by the vibration of the bells. Neither the settlements nor the inclination towards the north-west are mentioned by him.

After the actual condition of the tower had been ascertained at the end of 1885, the opinion of Mr. Pearson was asked for at my request. His report is dated December 21, 1885. It concludes by advising the entire rebuilding of the tower as the best course to adopt, though he previously speaks of the tower becoming strong enough for the bells, provided that it was strengthened by the additional masonry which I had recommended.

It will be well to place by the side of Mr. Pearson's report the letter which has recently appeared in the *Times* from Lord Grimthorpe, as his opinion seems to agree with Mr. Pearson's. He finds great fault with all concerned for not having rebuilt the tower with larger buttresses. He states that if this had been done the bells could have been rung in it with perfect safety, clearly implying that the tower as it now stands is not strong enough to receive the bells. This opinion is of much importance, as no one knows more of the effect produced by bells than Lord Grimthorpe.

The sub-committee have a letter from Canon Cattley, of Worcester, who stands only second to Lord Grimthorpe in his knowledge of bells and their requirements. His opinion is as follows:—"If the recent work only includes a recasing of the old, without any additional buttresses, it would be folly to place the bells as before; the thrust of that heavy weight of metal is enormous, the old troubles would again soon show themselves, and the same anxiety would ensue. If that splendid offer towards a new bell-tower still holds good, I hope the authorities will accept it."

Canon Cattley is of opinion that even chiming the bells would be injurious.

That the tower of St. Michael's was not originally intended to carry a heavy peal of bells is shown by the fact of their being no ringing chamber provided, except indeed the room above the groining. It would appear that the bells were at first hung in the octagon storey below the spire, where the corbels for the beams still remain. That the bells hung in such a slightly built structure as this is must have been of very light weight is certain. This peal was hung in the year 1429.

There are various records of the bells being added to and recast, and probably at some period they were placed in the chamber above the groining, in which position they must either have been chimed or rung from some stage inserted in the lantern below.

The present peal of bells was contracted for and erected in 1774, and the following significant paragraph relating to them occurs in Sharpe's "History of Coventry":—

"The apprehension of injury to this beautiful tower and spire became so general after the new and enlarged peal of ten bells was hung in 1774, that a committee consisting of the neighbouring noblemen, gentlemen, and principal inhabitants of the parish, was appointed on June 19, 1793, to examine into the state of the tower, and conduct the necessary repairs.

"On July 17 following, the late Mr. Wyatt and Mr. Potter, of Lichfield, attended the committee, and gave their decided opinion that the bells had been a considerable injury to the tower, and would continue so whilst in their present situation."

It was after this report, and only nineteen years after the peal of bells had been hung, that they were taken down and the structure of timber erected to carry them, as it was hoped, independently of the tower itself; at the same time extensive repairs were carried out, "the decayed and fractured stones being taken out and replaced by new ones, and strong bands of iron let into the stone at different intervals, thus rendering the fabric, in the opinion of the architect, as strong as when first built." It is not necessary to pursue the history of the bells any further, as it is familiar to all how, in spite of all that was done at this time at a great expense, "to make the tower as strong as when first built," the mischief went on getting worse and worse, till the present greater work of restoration was begun in 1885.

No one doubts for a moment that if the tower had been entirely rebuilt and its walls and buttresses increased in strength, as advocated by Lord Grimthorpe, it could have been made strong enough to bear the strain of the bells, but to have done this would have been to alter the beautiful design to a very serious extent, and the opinion of the committee was absolutely against this. Even the small addition to thickness of two of the walls recommended by me was not entertained, and a resolution was unanimously passed to restore the tower



exactly on its own lines. This determination was come to by the committee with the full knowledge of what Mr. Pearson had just reported, and also that both the architect and contractor had expressed the opinion, that while on these lines the tower could be made perfectly secure, it would not be able to bear safely the strain of bells ringing in peal.

The opinion which I then expressed I still hold. The tower was never designed to bear any such strain. Its walls are thin, its buttresses very light, whilst its stonework is pierced by a larger number of openings than can be found in any other steeple.

It is these features which give it its wonderful beauty and grace, but at the same time they deprive it of that immovable strength which is essential in a bell tower.

No doubt we have substituted a good foundation for a bad one, and have faced the tower with a hard and durable stone. We have also bonded the cracks and repaired all the settlements. But the weakness inherent to the design remains; the tower still inclines seriously from the perpendicular, and in spite of all the new stone used in refacing the exterior and in repairing the fissures, the body of the walls is still composed of the stone they were originally built of, and which has proved so untrustworthy. Nothing but rebuilding the tower entirely could have got rid of this.

I claim that we have, by the great work of restoration, rendered the tower absolutely secure, and, if fairly dealt with, able to stand for centuries to come in all its recovered beauty. Our pledge did not go beyond this, and I cannot but think that the past history of the tower affords a warning against exposing it once more to a strain which it is not designed to withstand.—Believe me, yours very faithfully,

J. OLDRID SCOTT, F.S.A.

31 Spring Gardens: Oct. 22, 1888.

A discussion followed, when it was agreed that the question of hanging the bells should be submitted to a body of referees, and that information was to be first obtained as to whether a committee of architects would consent to become referees, and as to whether it would be desirable and possible to associate with them, or to obtain independently, the opinion of an engineer or engineers, and at what cost the opinions could be obtained; the sub-committee to report the result of their inquiries at a future meeting.

### THE EDINBURGH GUILDRY.

ON Monday the annual meeting of the Edinburgh Guildry was held in the Council Chamber. Bailie Russell presided, and moved the re-election as Dean of Guild of Sir James Gowans. Sir James had had a great deal to do with the improvement of the city. His tact and ability and professional training had all been very marked, and had been of the greatest service to the city. The motion was unanimously adopted.

Sir James Gowans, who then took the chair, thanked the meeting for the honour they had done him in re-electing him for another year as Dean of Guild. He had great pleasure in the work of the Guildry Court. It went to his heart, it was quite in his way, and he was bound to say he would not have been in such good health if it had not been for the work of the Dean of Guild Court. He then gave a report of the work during the past year. The members of the Court, he said, took the opportunity of expressing their appreciation of the support and friendly co-operation which has been so readily given by the architectural profession and the leading master builders of the city. In connection with tenements of flatted houses, the Court had been at great pains to improve upon the old arrangements of dark, precipitous, and insanitary staircases. After careful consideration of the subject, for four-storey tenements the Court were of opinion that nothing less than a large roof-light or cupola over the staircase of an area of over 150 superficial feet, and an open "well" for light in the centre of the staircase of an area of 40 superficial feet, should be the minimum. The Court had also insisted on the heightening and thickening of the walls of chimneys, with a view to prevent smoky flues. Special attention had been given to new bakehouses. The practice had long been to utilise the basement or cellar flat of a tenement for bakehouses, where sufficient light and ventilation were impossible, and the heat and fumes were extremely liable to penetrate the occupied flats above. Parties had therefore been urged to arrange for having these erected above ground; and although the Court had not always been fully successful in this respect, still abundance of light and ventilation had been obtained in cases where they had been sanctioned, in addition to complete disconnection from the remainder of the tenement. In the beginning of the current year the Court prepared a pamphlet entitled "Memoranda for the Guidance of Petitioners, Architects, and Master Builders, with reference to the Preparation of Plans for the Dean of Guild Court and the Erection of New Houses and Buildings." This had not been taken advantage

of as it ought to have been, and they were still having complaints that they had not published a list of the requirements of the Court in the very particulars contained in the pamphlet referred to. Another important matter to which the Court had had its attention directed has been the disposition of parties to let and occupy new houses too soon. Of course, with modern appliances of steam cranes and mortar-grinding mills, houses were now erected more expeditiously than in former years, and the result was that the walls, plaster, and deafening retained moisture for a longer period after the houses were finished. It was, therefore, of vital importance that reasonable time be allowed for drying and seasoning, especially with houses and apartments where the light and heat of the sun did not directly operate. During the past year there had been 531 applications to the Court, as against 539 in 1886-7; 527 warrants were granted, as against 508; 163 had reference to first-class houses, villas, &c., as compared with 186; 125 had reference to tenements, as against 136; and there had been eleven prosecutions, as compared with 16 for 1886-87. The number of separate houses included in the statement for the year was:—Villas, 55; self-contained houses, 111; public buildings, public works, and business premises, 29; alterations on existing buildings, 403; 127 tenements, consisting of 148 shops and 1,229 houses—total number of dwelling-houses, 1,395. Of these 127 tenements, 14 had one apartment, 439 had two, 344 had three, 289 had four, 105 had six, 3 had seven, 1 had eight, 5 had nine, 2 had ten, and 1 had twelve. In 289 new buildings, drainage had been examined and tested, the extent of drains tested being 12¼ miles. The following houses and tenements had all the drains entirely outside the walls of the buildings:—Villas, 38; self-contained houses, 57; tenements, 62. The number of houses examined and certified by the burgh engineer and master of works as being fit for occupation in accordance with the Act was:—Self-contained houses, 63; villas, 27; public and other buildings, 14; 76 tenements, consisting of 112 shops and 711 houses—total number of houses, 801. The rental of the foregoing certified houses was as follows:—Houses of one and two apartments, yearly rental 5% to 13% inclusive, 275; houses of three apartments, yearly rental 14% to 18% inclusive, 124; houses of four apartments, yearly rental 19% to 29% inclusive, 194; houses of five or more apartments, and several self-contained houses, yearly rental 30% to 40% inclusive, 115; self-contained houses and villas, yearly rental 41% to 100% inclusive, 87; first-class villas, yearly rental 101% to 170% inclusive, 6. The total rental of the new houses certified during the year was 19,195%, and it was interesting to note that the increase of rental over that of the past year, as reported by Mr. Paterson, the city assessor, amounts to 28,375%, the following wards contributing to that sum as follows:—St. George's, 6,074%; Newington, 5,935%; St. Luke's, 3,194%; St. Cuthbert's, 3,047%. House accommodation of a most satisfactory and healthy description had thus been provided for an estimated population of 4,000 persons. The last extension of the city boundaries was made in 1882, over six years ago. That extension was evidently far too limited in its range, as already feuing had extended so as to certain points to touch, and even to stretch beyond, the city limits. Several fine healthy suburbs are being rapidly filled up, such as Craigmillar, Grange, Braid, and Plewlands. The acquisition of part of the Braid Hills as a public recreation ground would no doubt tend to develop feuing in that direction. Towards the west, the city was already touching the extended boundary at Gorgie, and feuing would no doubt stretch westwards still further. In the first-mentioned cases, such as Craigmillar, Grange, and Braid, and part of Plewlands, the feuing arrangements were such that each house possessed an extent of open ground far in excess of the minimum standard prescribed by the Act. But just in proportion as a city stretched her bounds, the more valuable became the ground towards the centre, as they are now having experience of in endeavouring to acquire a public park at Pitt Street. These facts showed the wisdom of securing ground for "lungs" and "recreation places" in time. Reference was made in last year's report to a movement which was then being inaugurated, viz., the registration of plumbers. This scheme was now in operation, and the result had been a healthy stimulus to the trade and the tradesmen, and improved workmanship. But it was worthy the earnest consideration of every one interested whether other tradesmen belonging especially to the building trades—such as masons, joiners, plasterers, &c.—should not adopt a similar registration scheme.

### BUILDING REGULATIONS IN GLASGOW.

AT the last sitting of the Glasgow Dean of Guild Court, Lord Dean of Guild Walls said:—Before entering upon the business of the Court this morning, I desire to draw attention to two or three questions of importance suggested by the fire which recently occurred in Buchanan Street. These valuable properties will no doubt be rebuilt, and it is the unanimous



opinion of the Court that in this, as in all cases in the city, the following suggestions ought to be rigidly followed out, the object, of course, being to use every means to prevent and limit the spread of fires. It is felt, therefore, first, that all foundations ought to be uniform in depth—that is to say, the foundation of a new building ought to be carried to the same depth as the old. This can easily be effected by either going deep enough with the new or under-building the old. Second, the walls of all buildings ought to be of a thickness and strength proportionate to the proposed height. Third, the height of all buildings, and especially of all warehouses intended for valuable combustible goods, ought to be uniform. Fourth, and what I consider most important, the utmost care ought to be exercised when joisting or any wood is necessarily brought contiguous to fireplaces or vents. Such timber ought to be bridled, and never carried nearer than a foot from vents or fireplaces. All hearths ought also to be placed on brick arches. I need scarcely say that these suggestions are thrown out alike in the interests of proprietors, tenants, and insurance offices, and if carefully carried out by architects and contractors much property, as well as many lives, may be saved. I cannot better illustrate the importance of what has been suggested on the subject of placing wood near fireplaces than to say that on the Monday following the great fire which took place in Buchanan Street, another fire originated in a large warehouse in Buchanan Street from this very cause. Fortunately it was detected in time, but had it occurred in the night it is impossible to say how disastrous it might have been. Other instances of a similar nature have recently come to my knowledge as having occurred in private houses from the same cause. I feel it to be my duty to add that the suggestions I have thrown out are entirely approved of by Mr. Paterson, chief of the fire brigade, and so far as is in the power of this Court they will be enforced.

#### FINE ART IN EDINBURGH UNIVERSITY.

ON Tuesday last Professor Baldwin Brown delivered the opening lecture of the session in his classroom of Edinburgh University. After sketching the main outlines of the session's course, which was to be on the general subject of Fine Arts in their origin, history, and relation to human life as a whole, the lecturer went on to deal briefly with the theme of the opening lecture, "Art as Decoration." This side of art was not so well understood and appreciated in the present day as in the past. When the ordinary person thought of a "work of art," he generally had before his mind one of the cabinet pictures or gallery pieces of sculpture familiar in exhibitions. But such were not to be looked on as typical forms of art. The cabinet picture was a comparatively modern invention. Both in painting and in sculpture the works of the finest periods of art in the past were of a decorative or monumental kind. Such, for example, were the frescoes of Giotto, Signorelli, Michel Angelo, and the sculptures of Pheidias. These works of decorative art differed from the pictures and statues of our exhibitions in their public character. The cabinet picture was the production of an individual artist, and was destined to pass into the private collection of some patron. Its interest was wholly in itself, it was independent and self-contained; while the monumental or decorative work appealed more largely to the public. This public character in decorative art led to healthful co-operation of many workers upon a single task, and as appealing to the ideas and beliefs current in a community, such decorative undertakings had a fulness of intellectual and moral interest often absent from works carried out in the modern spirit. The first point might be illustrated from the building and decoration of the great Mediaeval monuments, such as the Gothic cathedral or the churches and civic palaces of Italy. All grades of workmen toiled together upon the same social level, and opportunities were always being afforded for a man to rise to the higher branches of his art. The qualities of imagination and thought required for decorative work of the highest kind might be judged of by a reference to productions like the sculptured decoration of the Parthenon or the frescoes of Michel Angelo in the Sistine Chapel. With regard to these last, probably twenty people were familiar with the single figures for one who had entered into the spirit of the whole composition. The lecturer then illustrated Michel Angelo's scheme by a photograph and description of the Sistine vault, and concluded by urging the need for artists of education and attainments to turn their attention to the higher branches of decorative work. The national history and the ballad literature of Scotland would furnish motives in abundance, if any person or public body would come forward to give a commission, say for the adornment with mural paintings of the Parliament Hall in the Castle of Edinburgh. Now that there was no longer such a demand for cabinet pictures as there was ten years ago, there should be available a large amount of artistic talent for this great but neglected sphere of work.

## Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

### HOW LORD ELGIN ACQUIRED THE PARTHENON SCULPTURE.

LORD BYRON, speaking as Minerva (see the "Curse of Minerva"), showered many curses upon the head of his brother peer, the Earl of Elgin, for carrying off the sculpture which is now in the British Museum. The diplomatist was a butt for the poet, and in "Childe Harold" he is said to be—

Cold as the crags upon his native coast,  
His mind as barren and his heart as hard.

Lord Byron explained the reasons which made him inimical towards the ambassador. "I am not," he said, "a collector or admirer of collections, consequently no rival; but I have some early prepossession in favour of Greece, and do not think the honour of England advanced by plunder, whether of India or Attica." But we imagine there was a still stronger reason. Lord Byron, as became a poet, was an admirer of nature; but in his famous letter on the Pope and Bowles controversy he maintained it was in a measure through the aid of art that nature became poetical. "Am I to be told," he asked, "that the 'nature' of Attica would be more poetical without the 'art' of the Acropolis? of the Temple of Theseus? and of the still all-Greek and glorious monuments of her exquisitely-artificial genius? Ask the traveller what strikes him as most poetical, the Parthenon or the rock on which it stands?" Owing to the acquisitiveness of Lord Elgin the Parthenon was mutilated; it was no longer able to exercise its old powers on poets, and therefore the culprit had committed one of the greatest of crimes. Such was Lord Byron's reasoning. He wrote as a poet who felt that a source of inspiration was lost.

There is no doubt that many people at the time felt that Lord Elgin's conduct was not praiseworthy. It was a time when England was very sensitive about acquiring any part of the property of another nation; and as Lord Elgin filled the office of ambassador his acts were supposed to compromise the country. Accordingly, when his lordship petitioned the House of Commons to purchase the marbles, his method of obtaining the works was declared by the House to be flagitious and dishonest. Afterwards a better spirit prevailed. The fact that the King of Bavaria lodged 30,000*l.* with a banker for the purpose of purchasing the sculpture could hardly fail to be without effect upon the Government of the time. A committee was appointed to inquire into the subject. Lord Elgin was examined, and, as will be seen from the evidence, was questioned in a manner which suggests the strength of the prejudice against his lordship. Finally, the sum of 35,000*l.* was voted as the value of the sculpture.

The Earl of ELGIN was called in and thus questioned:—

Your lordship will be pleased to state the circumstances under which you became possessed of this collection, and the authority which you received for taking the marbles from Athens?—The idea was suggested to me in the year 1799, at the period of my nomination to the Embassy at Constantinople, by Mr. Harrison, an architect, who was working for me in Scotland, and who had passed the greater part of his life in Rome, and his observation was that, though the public was in possession of everything to give them a general knowledge of the remains of Athens, yet they had nothing to convey to artists, particularly to students, that which the actual representation by cast would more effectually give them. Upon that suggestion, I communicated very fully with my acquaintances in London. I mentioned it to Lord Grenville, Mr. Pitt, and Mr. Dundas, upon the idea that it was of such national importance that the Government might be induced to take it up, not only to obtain the object, but also to obtain it by the means of the most able artists at that time in England. The answer of Government, which was entirely negative, was that the Government would not have been justified in undertaking any expense of an indefinite nature, particularly under the little probability that then existed of the success of the undertaking. Upon that understanding I applied to such artists here as were recommended to me as likely to answer the purpose, in particular to Mr. Turner, to go upon my own account. Mr. Turner's objection to my plan was that, as the object was of a general nature, and that the condition I insisted upon was that the whole results of all the artists should be collected together and left with me, he objected because he wished to retain a certain portion of his own labour for his own use; he moreover asked between seven and eight hundred pounds of salary, independently of his expenses being paid, which of course was out of my reach altogether; therefore nothing was done here preparatory to the undertaking at all. When I went to Sicily



I met Sir William Hamilton, to whom I explained my views; he encouraged my idea, and applied to the King of Naples for permission for me to engage his painter Lusieri, who was at that time employed in picturesque views of Sicily for the Sicilian Government; who went with Mr. Hamilton to Rome, and, upon the plan arranged with Sir William Hamilton, engaged the five other artists who accompanied him ultimately to Turkey. Those five persons were two architects, two modellers, and one figure painter. Lusieri was a general painter. They reached Constantinople about the middle of May 1800, at the time when the French were in full possession of Egypt, and of course no attempts could be made with any prospect of general success. I sent them to Athens, however, as soon as an opportunity offered: for several months they had no access to the Acropolis, except for the purpose of drawing, and that at an expense of five guineas a day; that lasted from August 1800 till the month of April 1801.

That limited access lasted about nine months?—Yes.

The fee of five guineas was one usually demanded from strangers?—There were so few strangers there I do not know, but in the instances which came to my knowledge it was so. During that period my artists were employed in the buildings in the low town of Athens. In proportion with the change of affairs in our relations towards Turkey, the facilities of access were increased to me and to all English travellers; and about the middle of the summer of 1801 all difficulties were removed. We then had access for general purposes. The same facilities continued till my departure from Turkey in January 1803, at which period I withdrew five out of the six artists; and having sent home everything that was in the collection, till the year 1812 Lusieri remained, with such instructions, and such means, and such powers, as enabled him to carry on the same operation to the extent that then remained to make it, as I concluded, more perfect: but from that period of 1803 till the present day, during my imprisonment in France, and during the remaining years, he has acted without any interruption, in the enjoyment of the same facilities, with a renewal of the same authorities; he has incurred the same expenses and done the same as before.

Where is he now?—Remaining there still; he was not there during the war, but he has obtained a renewal of the same authorities since.

Your lordship has stated that when the change took place in the political relations between this country and Turkey a facility of access was continued to you and all your artists?—Yes.

And in 1801 all difficulties were removed which applied to the erecting scaffolding and making excavations; was the same permission to erect scaffolding and make excavations given to other persons at Athens at that time?—I do not know of any such instance; other persons made use of the same scaffolding of course. I do not know that any specific permission of this kind was applied for; I believe the permission granted to me was the same in substance and in purport as to any other person, with the difference of the extent of means and an unlimited use of money. There was nobody there, I believe, who was doing anything but draw.

Did the permission specifically refer to removing statues, or was that left to discretion?—No; it was executed by the means of those general permissions granted; in point of fact, permission issuing from the Porte for any of the distant provinces is little better than an authority to make the best bargain you can with the local authorities. The permission was to draw, model, and remove; there was a specific permission to excavate in a particular place.

Was the permission in writing?—It was, and addressed by the Porte to the local authorities, to whom I delivered it; and I have retained none of them. In a letter I addressed to Mr. Long in the year 1811 I made use of these words:—"That the ministers of the Porte were prevailed upon, after much trouble and patient solicitation, to grant me an authority to remove what I might discover, as well as draw and model."

Does your lordship suppose this to have been the same form of permission that had been given to other people; and that your lordship employed it to a greater extent than other people?—It was so far different that no other person had applied for permission to remove or model.

Does your lordship know whether any permission had been granted to any other person to remove or model?—Monsieur de Choiseul had the same permission; and some of the things he removed are now in my collection.

He removed them while he was minister at the Porte?—Yes.

Had that permission ever been granted to excavate and remove before Monsieur Choiseul had it?—I do not know.

There seems to be a considerable difference between to excavate and remove and to remove and excavate; the question was not whether your lordship was permitted to remove what you should find on excavation, but whether your lordship was permitted to remove from the walls?—I was at liberty

to remove from the walls; the permission was to remove generally.

Was there any specific permission alluding to the statues particularly?—I do not know whether it specified the statues, or whether it was a general power to remove. I was obliged to send from Athens to Constantinople for permission to remove a house.

That was a house belonging to the Turkish Government; did not your lordship keep any copy of any of the written permissions that were given to your lordship?—I kept no copies whatever; every paper that could be of use at Athens was left there as a matter of course, because Lusieri continued there: the few papers I brought away with me were burnt on my detention in France; my private papers I mean, and all my accounts, which I had brought away from Turkey.

In point of fact, your lordship has not in England any copy of any of those written permissions?—None.

Did the committee understand you to say that it is possible Lusieri has such copies?—Certainly; they will be at Athens, either in his possession or in the possession of the authorities there.

Has your lordship any distinct recollection of having had such copies of the authorities, and of having left them in Lusieri's possession?—I cannot speak to the fact so precisely as the committee may wish; the authority itself was given over to the proper officer, and then Lusieri obtained from him any part of it that was necessary to be exhibited on any future occasion.

Did your lordship, for your own satisfaction, keep any copy of the terms of those permissions?—No, I never did; and it never occurred to me that the question would arise; the thing was done publicly before the whole world. I employed three or four hundred people a day; and all the local authorities were concerned in it, as well as the Turkish Government.

When your lordship stated that the permission granted to your lordship was the same that had been granted to other individuals, with the difference only of the extent of means, did you mean to convey to the committee that permissions to remove marbles and carry them away had been granted to other individuals?—No; what I meant to say was this, that as far as any application was made to the Turkish Government through me, or to my knowledge, the same facilities were granted in all cases. I did not receive more as ambassador than they received as travellers; but as I employed artists, those permissions were added to my leave. I am not aware of any particular application being made for a specific leave that was not granted where a similar leave was granted to myself.

Your lordship has stated that no individual had applied for leave to remove?—To the best of my recollection no application had been made to remove.

No application, either through you or to your knowledge?—Yes; as far as I can recollect.

Of course your lordship means to except the permission that you stated before had been long antecedently given to Monsieur Comte de Choiseul?—Yes.

Do you know, in point of fact, whether the same permission was granted to Monsieur Comte de Choiseul as was granted to you?—He exercised the same power.

But you do not know whether he had the same permission?—No.

Then within your lordship's knowledge there is no instance of a private individual having obtained such permission?—I have no knowledge of any individual having applied for it, and I do not know whether it has been granted or not; I do not know that there was any difficulty in the way of removing by anybody.

Was it necessary that those powers should be renewed after your lordship came away, and that the artists already employed by you are employed ostensibly by the ministers there?—I do not know what distinction there is between Lusieri and any other artist.

Is he acting under the permission your lordship obtained?—There has been war since.

Has it been renewed to your lordship, or individually to themselves?—They have made the application through the channel they thought proper; what it was I do not know; but it was probably the same permission that Lord Aberdeen had, and many other travellers that have been there.

Your lordship does not know whether it was renewed to your lordship or to Mr. Liston, or whether they are acting under a permission granted to him, or individual permissions granted to the artists?—I do not know what the detail is; I conclude they are acting exactly as any other traveller there is: there is no advantage from the ambassadorial title that I had then that can apply to them now, because there has been war since.

Have they power to excavate, model, and remove?—They have removed a great deal from thence.

And you do not know in what shape those powers have been renewed since the war?—No, I do not.



In the letter to Mr. Long, which you have stated, you speak as having obtained these permissions after much trouble and patient solicitation; what was the nature of the objections on the part of the Turkish Government?—Their general jealousy and enmity to every Christian of every denomination, and every interference on their part. I believe that from the period of the reign of Louis XIV. the French Government have been endeavouring to obtain similar advantages, and particularly the Sigean marble.

They rested it upon that general objection?—Upon the general enmity to what they called Christian dogs.

That was not the manner in which they stated their objection?—No, but that is the fact; it was always refused.

Without reasons?—Without reasons assigned; everybody on the spot knew what those reasons were, that they would not give any facility to anything that was not Turkish.

All your lordship's communications with the Porte were verbal?—There was nothing in writing till an order was issued.

The objection disappeared from the moment of the decided success of our arms in Egypt?—Yes; the whole system of Turkish feeling met with a revolution, in the first place, from the invasion by the French, and afterwards by our conquest.

Your lordship has stated in your petition that you directed your attention in an especial manner to the benefit of rescuing from danger the remains of sculpture and architecture; what steps did you take for that purpose?—My whole plan was to measure and to draw everything that remained and could be traced of architecture, to model the peculiar features of architecture. I brought home a piece of each description of column, for instance, and capitals and decorations of every description, friezes and moulds, and, in some instances, original specimens; and the architects not only went over the measurements that had been before traced, but by removing the foundations were enabled to extend them and to open the way to further inquiries, which have been attended since with considerable success.

You state that you have rescued the remains from danger?—From the period of Stuart's visit to Athens till the time I went to Turkey a very great destruction had taken place. There was an old temple on the Ilissus had disappeared. There was in the neighbourhood of Elis and Olympia another temple, which had disappeared. At Corinth I think Stuart gives thirteen columns, and there were only five when I got there; every traveller coming added to the general defacement of the statuary in his reach: there are now in London pieces broken off within our day. And the Turks have been continually defacing the heads; and in some instances they have actually acknowledged to me that they have pounded down the statues to convert them into mortar. It was upon these suggestions and with these feelings that I proceeded to remove as much of the sculpture as I conveniently could; it was no part of my original plan to bring away anything but my models.

Then your lordship did not do anything to rescue them in any other way than to bring away such as you found?—No, it was impossible for me to do more than that; the Turkish Government attached no importance to them in the world; and in all the modern walls these things are built up promiscuously with common stones.

It has been stated that in a despatch from Turkey, at a very early period after your lordship went out, that your lordship had an occasion to write to His Majesty's Government concerning your public appointment as a minister, and that you stated some circumstances distinctly to them at that time which showed your understanding, and their understanding, that your proceedings in Greece were entirely upon your own private account; is that statement correct that there is a document in existence, dated in the year 1803, which will prove that fact?—There is, precisely what is alluded to in a despatch at the period of my leaving Turkey.

In point of fact, did the Turkish Government know that your lordship was removing these statues under the permission your lordship had obtained from them?—No doubt was ever expressed to me of their knowledge of it; and as the operation has been going on these seventeen years without any such expression, so far as I have ever heard, I conclude they must have been in the intimate knowledge of everything that was doing.

In point of fact, your lordship does not know that they were ever apprised of it?—It is impossible for me to have any doubt about it.

Did your lordship ever apprise any of the Government of it in conversation?—The chance is that I have done it five hundred times, but I cannot answer specifically when or how.

Did not the committee understand your lordship to say that they must have so well understood it that in one instance your lordship got a special order to remove a particular thing?—There was a special permission solicited for the house; when I did excavate in consequence of getting possession of that house there was not a single fragment found; I excavated down to the rock, and that without finding anything, when the Turk to whom the house belonged came to me and laughingly told me

that they were made into the mortar with which he built his house.

Then the permission was to buy the house?—To pull it down.

Since 1803 has Lusieri continued to remove things?—I can answer that question by a fact of considerable importance. When I was in Paris a prisoner, in the year 1805, living in Paris perfectly tranquilly with my family, I received a letter from an English traveller complaining of Lusieri's taking down part of the frieze of the Parthenon. The next morning a common gendarme came and took me out of bed, and sent me into close confinement away from my family. Such was the influence exercised by the French to prevent this operation.

Your lordship attributed it entirely to the French?—Yes; the French sent me in that way down to Melun.

In reference to what was stated in a passage of your lordship's petition, will your lordship be so good as to say whether you have ever heard of the Turkish Government taking any care that the works of art should not be destroyed?—Certainly not; within my knowledge nothing of the sort was ever done; the military Governor of the Acropolis endeavoured to keep them after people had appeared anxious to get them away.

So that the hesitation on the part of the Government your lordship attributes to a dislike to the Christians?—The general apprehension of doing any act displeasing to the French operated at the time the French were in Egypt.

Has your lordship any knowledge of any particular application made to the Turkish Government by any individual, and granted, of an equal extent with your lordship's?—I have not any knowledge of what has passed since, except the details of Lusieri's own operations.

From an observation in part of your lordship's evidence, the committee concluded that your lordship has, since 1812, received several of these marbles?—In the year 1812 about eighty cases arrived.

Have there been any received subsequently?—I believe there have, but I am not very certain, having been out of the country myself.

(To be continued.)

## SCHOOL BUILDINGS.

**Birmingham.**—The latest addition to the buildings of the Birmingham School Board, the commodious schools which have been erected in the Soho Road, near to the Soho Station on the Great Western Railway, were open lately for educational work. All the other existing schools of the Board have been erected from designs by Messrs. Martin & Chamberlain, but in this case an exception to the previous rule has been made. In 1886 five invitations were sent to selected Birmingham architects to send in designs for school buildings on the Soho site, which were to be arranged on the central hall principle, and to be of one storey in height. One of the five sets of designs was, after careful consideration, unanimously selected by the Sites and Buildings Committee, and subsequently approved by the Board, and this design, which it subsequently transpired was by Messrs. Thomason & Whitwell, has now, after considerable delay, been carried out. The site, though considered to be the best obtainable in the neighbourhood, was extremely uneven and depressed below the level of the road. The lower parts have required to be filled up to a considerable depth, and as it proved that the land had been deeply excavated for clay, and that but little of it was solid ground, a very heavy outlay was occasioned in the foundations, retaining walls, brick arching to carry paved floors, &c. Sixteen classrooms are provided, each to accommodate sixty scholars. Eight of these are arranged in pairs divided by revolving screens. The classrooms are grouped around two large assembly halls, the first of which measures 67 feet by 30 feet, and the second, for the junior half of the school, 55 feet by 30 feet. Five spacious entrances, which serve as cloak-rooms, give easy access to the playgrounds. Three private rooms are provided for the teachers. All the parts are in easy communication, and the whole is arranged so as to give every possible facility for inspection and control. The rooms and corridors are well lighted throughout, and the aspect internally and externally is rendered pleasing and cheerful without resort to expensive ornament. The exterior architecture is of a distinctive character. It is Gothic in feeling and expression, but does not closely follow any particular phase or period of that style. The material of the external walls is brick, with terra-cotta, principally of buff colour, moderately used in the windows and doorways. The central windows in the classroom gables are of very large size, mostly three lights in width, with terra-cotta mullions and transoms, behind which are wood frames to contain the glazing, designed so as to give the greatest possible lighting space. The ventilating turret is of simple outline, and terminates in a slated spire. The caretaker's house adjoins the entrance to the girls' department from Soho Road, and has



dressings of buff terra-cotta to the windows, varying in design from those in the schools proper. The terra-cotta used was made by Messrs. Joseph King & Co., of Stourbridge. Messrs. Wilson & Son, of Soho Hill, are the builders. The school desks and other furniture are the work of Messrs. David Clark & Co. and of Messrs. Bernard Clarke & Sons. As already stated, Messrs. Yeoville Thomason & Cooper Whitwell, of Cannon Street, Birmingham, were the architects; and Mr. J. Chattaway, the clerk of the works to the School Board, acted under them in superintending the erection of the buildings. The builders' contract amounted to 8,900*l.*, but to this sum considerable extra cost has to be added for the extension of the playgrounds and for additional work necessitated in making the foundations.

### GENERAL.

**Mr. J. F. White, LL.D.**, has presented to the Aberdeen Art Gallery Committee a landscape picture, *The Water Lilies*, by W. Roelofs, the Dutch painter.

**Mr. Crozier, C.E.**, county architect of Durham, has sent in his resignation, after fulfilling the duties of that office for about forty years.

**Messrs. Paley & Austin** have prepared plans for the erection of the proposed new church, St. John's, Cloughfold, Rawtenstall.

**Mr. H. Ross Hooper** will read a paper on "The Practice of Foundry Work" at the meeting of the Society of Engineers on Monday evening, the 5th inst.

**Mr. James Ormrod**, of Halliwell Lodge, Bolton, is erecting at his own cost a church in the neighbourhood of his Welsh seat, near Ruabon.

**The Prince of Wales** has engaged to open the Jubilee Memorial Hall at Ealing about the middle of this month.

**Lady Whitworth** and her co-executors are giving to Darley Dale, Derbyshire, under the will of the late Sir Joseph Whitworth, an institute for educational and recreative purposes, a hospital, and a smaller hospital for infectious diseases. The total expenditure is estimated at upwards of 25,000*l.*

**The Council of the Sanitary Institute**, at a meeting held on October 25, enrolled thirty-eight members and Associates.

**The Public Buildings** erected at Darlaston from the designs of Mr. J. A. Cossins, of Birmingham, as a Jubilee memorial, were formally opened on Wednesday.

**The Town Hall**, which has been erected at Burnley at a cost of 40,000*l.*, was formally opened on Saturday.

**The Bridge House Estates Committee** purpose obtaining parliamentary powers for an extension of four years' time for completing the Tower Bridge.

**The Gordon Institute** for working lads was opened at Liverpool on Saturday by the Earl of Meath.

**The Jubilee Nursing Institute**, erected from the designs of Mr. J. Houghton Spencer, at Taunton, at a cost of 10,000*l.*, has been opened by the Hon. W. H. B. Portman. Among the subscribers was an anonymous donor, who gave 5,000*l.*

**The Plans** of the Roman Catholic church, which is to be erected at St. Anne's-on-the-Sea, at an outlay of 12,000*l.*, have been prepared by Messrs. Pugin & Pugin, of Westminster.

**Derby House**, in Watergate Street, Chester, known as the ancient palace of the Stanleys, has been purchased from the Chester Archaeological Society by Lord Derby, who intends to preserve the building as an archaeological and historic relic.

**An Executive Committee**, of which the Mayor is the chairman, has been appointed to raise 5,000*l.* as an expenses and guarantee fund, for the visit of the British Association to Leeds in 1890.

**A Conservative Club**, erected from the designs of Messrs. Pierpoint & Fraser, of Warrington, in Elizabethan style, has been opened by Lord Cranborne at Widnes.

**A Faculty** has been granted for the addition of a south aisle to All Saints' Church, Edmonton, according to the designs of Mr. Scott. A sum of 1,900*l.* is also to be spent in alterations at South Hackney parish church.

**A Professorship of Architecture** is proposed to be established for the province of Ontario, Canada.

**Lord Egerton of Tatton** has promised 500*l.*, and Mr. Samuel Hargreaves 1,000*l.*, towards the cost of the restoration of the chancel and other parts of St. Wilfrid's Church, Mobberley, Knutsford.

**A Bazaar** in aid of the building fund for a manse at the Presbyterian church in Dunfermline is open in the Drill Hall, which is arranged to represent a street in Jerusalem.

**Burton Dassett Church**, Warwickshire, has undergone partial restoration under the direction of Mr. J. A. Cossins, of Birmingham.

**The Brighton Alhambra**, built from the designs of Mr. Frank Matcham, as a music-hall, was opened with a performance on Monday night. The building has been constructed so that, if required, it can be converted to the purposes of a circus.

**The Glasgow Town Council** on Monday gave approval to a scheme for building a public hall at Camlachie, and granted a site for the purpose at a nominal rent of one shilling per annum.

**The Foundation-stone** of a Conservative club at Watford, which is being erected from the designs of Mr. W. H. Syme, A.R.I.B.A., has been laid.

**The Conversazione** of the Edinburgh Architectural Association was held on Thursday evening, when Professor G. Baldwin Brown, M.A., the president, delivered an address, his subject being "Some Aspects of the Work of an Architectural Association."

**H.R.H. the Prince of Wales** has consented to visit Middlesbrough in January for the purpose of opening the new town hall and municipal buildings, Middlesbrough, which have been erected from the designs of Mr. G. Gordon Hoskins, F.R.I.B.A., at an estimated cost of 120,000*l.*

**A Church** is to be built at Seascale, at a cost of about 2,000*l.*, from the designs of Mr. C. J. Ferguson, of Carlisle.

**A Surplus of £90** has been realised from the Art and Industrial Exhibition lately held in Penrith.

**The Church** built by Lord Northbrook on his estate, at Stratton, was opened on Thursday.

**The Winter Garden** at Cheltenham is being utilised for a ten days' bazaar. The building has been formed into an Oriental city, with gate of the Palace of Aladdin, streets of palaces, an imitation of the Alhambra with its court of lions, the Bridge of the Golden Pactolus, and a sky of Eastern blue.

**A Bazaar** has been opened in the town hall of Atherstone in aid of the restoration fund of the parish church chancel.

**A Building**, to comprise a public hall and recreation-rooms, is proposed to be erected at Newtown St. Boswells, as a memorial of the late Hon. Major Baillie, of Dryburgh.

**Mr. Alexander Duncan**, of Rhode Island, U.S., has offered to give 1,000*l.* to the directors of the Arbroath Infirmary, for the purpose of building a convalescent house for that institution.

**The Heritors of St. Cuthbert's Parish, Edinburgh**, have approved of plans for reseating and alterations in the church, which will cost 10,000*l.* to carry out.

**The Society of Architects** will have a conversazione at the New Gallery, Regent Street, on the 13th inst., when the President will deliver an address. A special general meeting will be held in St. James's Hall on the 27th inst.

**Mr. C. Gourlay, Architect**, has commenced a course of lectures on "Hygiene for Architects and Builders," in connection with the Glasgow and West of Scotland Technical College.

**The Portuguese Government** are inviting tenders of designs for the building of a Palais de Justice for the accommodation of all the Courts of Justice in that capital, with the exception of the Commercial Court. Further particulars may be learned on personal application to the Commercial Department of the Foreign Office.

**Mr. Mark H. Judge**, architect, is a candidate for a seat on the London County Council for North Paddington.

**Operations** for widening Irvine Bridge have been started. The first mention of an Irvine Bridge was in a document bearing the date of 1533. On August 8 of that year Hugh, first Earl of Eglinton, was appointed by Patrick, Earl of Bothwell, Great Admiral of Scotland, to be Depute-Admiral within the bounds of Cunninghame—"This is to say, betwix Kelly burn and the brig of Irwyn." The brig of 1533 was probably the "faire stone brydge" mentioned by old Timothy Pont in 1608. The contract for the rebuilding of the old portion of the present structure is dated 1748. It was only 11 feet wide, and in 1826 that width was doubled from plans by the late Mr. Paterson, of the Union Bank here. The present widening will throw the whole space between the parapets into the roadway, and give broad pavements besides. There are three arches, and the river is at this part about 70 yards broad.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, NOVEMBER 2, 1888.

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*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

### CONTRACTS OPEN.

**BARRY.**—Nov. 9.—For Erection of Temporary Wood Offices. Mr. Sydenham W. Richards, Architect, 10 Church Street, Cardiff.

**BATLEY.**—Nov. 9.—For Building Weaving Shed, Alexandra Mill. Messrs. Holtom & Fox, Architects, Westgate, Dewsbury.

**BETHNAL GREEN.**—Nov. 6.—For Building Laundry, Clothing Store, and Sanitary Turret for Water-closets and Fittings. Two Covered Ways and Roof Repairs at the Workhouse. Messrs. A. & C. Harston, Architects, 15 Leadenhall Street, E.C.

**BRADFORD.**—Nov. 3.—For Building Weaving Shed, Westbrook Mills. Mr. John Drake, Architect, Winterbank, Queensbury.

**BRADFORD.**—Nov. 3.—For Building Residence and Alteration of adjoining one, Manningham. Mr. C. E. Marsden, Architect, 3 John Street, Bradford.

**BRADFORD.**—Nov. 5.—For Completion of Six Houses, Horton Road. Mr. Samuel Jackson, Architect, 33 Kirkgate, Bradford.

**BRADFORD.**—Nov. 13.—For Additional Buildings at Fever Hospital. Messrs. Morley & Woodhouse, Architects, Swan Arcade, Bradford.

**CHESTERFIELD.**—Nov. 14.—For Building Board School for Boys, with Fence Walls, &c., at Clown. Messrs. Robinson & Son, Architects, 13 Corporation Street, Chesterfield.

**CWMPENNAR.**—Nov. 8.—For Additions to Board Schools. Mr. R. Orton Gery, Clerk to the School Board, Aberdare.

**DEVONPORT.**—Nov. 5.—For Building Board School. Mr. J. P. Goldsmith, School Board Offices, Ker Street, Devonport.

**FINSBURY.**—Nov. 16.—For Construction of Underground Urinals, Water-closets, &c., South Place. Mr. H. Blake, Sewers' Office, Guildhall, E.C.

**FULHAM.**—Nov. 15.—For Building Board Room and Offices, Dispensary, Out Relief Offices, Porter's Lodge and Receiving Wards at Workhouse. Messrs. H. Saxon Snell & Son, Architects, 22 Southampton Buildings, W.C.

**HALIFAX.**—Nov. 12.—For Building Sanatorium, Crossley and Porter Orphan Home. Mr. John Ely, Architect, 24 Brazenose Street, Manchester.

**KENSAL TOWN.**—Nov. 9.—For Building Public Library. Messrs. Harslake & Mortimer, Architects, 5 Great Queen Street, Westminster.

**KINETON.**—Nov. 6.—For Building Club Room. Mr. A. G. Greenhill, Architect, Rugby.

**LAISTERDYKE.**—Nov. 8.—For Building Shops and Warehouses. Messrs. Empsall & Clarkson, Architects, 55 Tyrrel Street, Bradford.

**LEEDS.**—Nov. 3.\*—For Building Clothing Factory. Mr. Dogshun, Architect, 1 East Parade, Leeds.

**LEICESTER.**—For Pulling Down Old Buildings. Mr. W. Millican, Architect, Grey Friars, Leicester.

**LEIGH.**—Nov. 31.—For Alterations to the Town Hall, for the Leigh Local Board. Mr. J. C. Prestwich, Architect, Leigh.

**LEIGH.**—Nov. 31.—For Painting, Paperhanging, Decorating at the Town Hall, for the Leigh Local Board. Mr. J. C. Prestwich, Architect, Leigh.

**NANTLLE.**—Nov. 3.—For Erection of Slate Sawing Sheds. Mr. W. L. Jones, Architect, Bangor.

**NEWTON FERRERS.**—For Addition to School. Mr. John T. A. Morshead, Salcombe Regis, Sidmouth.

**SOUTHAMPTON.**—Nov. 12.—For Partial Reconstruction and Reseating of Above Bar Congregational Church. Mr. W. H. Mitchell, Architect, 8 Portland Street, Southampton.

**WORTHING.**—For Restoration of Colonnade House. Mr. Alfred Broad, Architect, 27 Dingwell Road, Croydon.

### TENDERS.

#### AYLESBURY.

For Alterations to Additional Tramp Wards, Bath-rooms, and Furnishing Hot-water System at the Union Workhouse, Aylesbury. Mr. W. F. TAYLOR, Surveyor.

G. Green, jun., Aylesbury	£	245	0	0
Horsman, Aylesbury		200	10	0
Hearn, Aylesbury		175	0	0
Grimsdale, Aylesbury		146	7	6
Paradine, Aylesbury		144	10	0
FOAB, Aylesbury (accepted)		138	19	0

#### BARROW.

For Building Chimney for the Barrow Board of Guardians.

Black, Barrow	£	59	0	0
Hickling, Syston		55	0	0
Fewkes, Quorndon		49	5	0
SLEATH, Rothley (accepted)		41	15	0

#### BOSTON.

For Altering the old Oil-cake and Flour Mills, High Street, Boston, into Salvation Army Barracks Buildings, for General Booth. Mr. J. WILLIAMS DUNFORD, Architect and Surveyor, 101 Queen Victoria Street, London, E.C.

Coxhead, Leytonstone	£	673	0	0
Parker & Hinds, Boston		626	0	0
Greenfield, Boston		604	0	0
Pinder & Leng, Boston		571	9	0
Burnett, Grimsby		525	0	0
Alderton & Wheeler, Cambridge		515	0	0
Leafe, Boston		440	0	0

\* Names and addresses to be forwarded not later than date.



## BRIDLINGTON QUAY.

For Building Three Houses east side of Flamboro' Road, for Miss M. E. Barr. Mr. J. EARNSHAW, M.S.A., Architect, Carlton House, Bridlington Quay.

Clark . . . . .	£1,100	0	0
Rennard . . . . .	891	0	0
Bailey . . . . .	860	0	0
Owston . . . . .	845	0	0

For Fence Walls, Flamboro' Road, for Mr. H. Tate. Mr. J. EARNSHAW, Architect, Wellington Road, Bridlington Quay.

Clark . . . . .	£79	0	0
Leeson . . . . .	74	0	0
Owston . . . . .	70	0	0
RENNARD (accepted) . . . . .	64	19	0

## BURTON-ON-TRENT.

For the Erection and Completion of Salvation Army Barracks Buildings, for General Booth. Seating accommodation provided for 900 persons. Estimates include Seating, Lighting, and Hot-water Heating. Mr. J. WILLIAMS DUNFORD, Architect and Surveyor, 101 Queen Victoria Street, London, E.C.

Hodges, Burton . . . . .	£1,250	0	0
Lowe & Sons, Burton . . . . .	1,200	0	0
Mellors, Burton . . . . .	1,063	16	0
Jarvis, Banbury . . . . .	965	0	0
Alderton & Wheeler, Cambridge . . . . .	898	0	0
COXHEAD, Leytonstone (accepted) . . . . .	848	0	0

## CLEATOR MOOR.

For Alterations to Property, Birk's Road, Cleator Moor. Mr. J. S. MOFFAT, Architect, 53 Church Street, Whitehaven.

J. Young, Whitehaven . . . . .	£253	10	0
J. Hartley, Distington . . . . .	250	0	0
Chapple & Son, Moor Row . . . . .	240	10	0
H. M'MAHON, Cleator Moor (accepted) . . . . .	212	0	0

## COCKERMOUTH.

For Heightening Portion of Boundary Walls, Wyndham Row School, Cockermouth.

Whittans & Sons, Maryport . . . . .	£24	16	3
J. Metcalf, Broughton Moor . . . . .	19	11	0
H. Auber, Dearham . . . . .	18	10	0
SMITH & MARSHALL, Maryport (accepted) . . . . .	17	13	0

## COCKERMOUTH—continued.

For Making 9-inch Sewer (1,150 yards), for the Cockermouth Local Board.

Fisher & Co., Cockermouth . . . . .	£419	13	0
R. Malabar, Liverpool . . . . .	378	17	6
J. H. Marlow, Maryport . . . . .	321	0	11
J. Wallace, Keswick . . . . .	313	6	5
J. Dalton, Broughton . . . . .	320	0	0
J. Taylor, Workington . . . . .	306	13	3
J. Reed, Stanwix . . . . .	294	18	2

## DEVONPORT.

For Pipe Sewer (1,840 feet), Johnston Terrace District. Mr. JOHN F. BURNS, Borough Surveyor, Devonport.

Parsons & Son, Plymouth . . . . .	£970	0	0
J. Healy & Son, Devonport . . . . .	950	15	0
Matcham & Co., Plymouth . . . . .	895	0	0
SHADDOCK BROS., Plymouth (accepted) . . . . .	863	10	0

## DOVER.

For Building Jubilee Wing at the Dover Hospital.

C. J. Gee, Dover . . . . .	£3,599	18	6
W. Bromley, Dover . . . . .	3,191	0	0
G. H. Denne & Son, Deal . . . . .	3,125	0	0
H. T. Belsey, Littlebourne . . . . .	3,125	0	0
W. & T. Denne, Walmer . . . . .	3,100	0	0
G. Pavey, Sittingbourne . . . . .	3,093	0	0
W. T. Doyle, Dover . . . . .	3,053	0	0
Hayward & Paramour, Folkestone . . . . .	3,007	0	0
Amos & Ford, Whitstable . . . . .	2,952	15	0
Lewis & Chandler, Dover . . . . .	2,950	0	0
H. Stiff, Dover . . . . .	2,885	0	0
H. M. Moody, Folkestone . . . . .	2,875	0	0
W. G. Lewis, Dover . . . . .	2,837	15	0
W. J. Adcock, Dover . . . . .	2,835	0	0
AUSTIN & LEWIS, Dover (accepted) . . . . .	2,830	0	0
A. H. Steele, Dover . . . . .	2,625	0	0

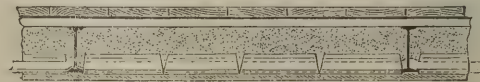
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A. H. Steel, Dover . . . . .	£245	0	0
W. Bromley, Dover . . . . .	200	0	0
W. T. DOWLE, jun., Dover (accepted) . . . . .	145	0	0

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Emery & Sons	£372	0	0
Brown & Son	370	0	0
R. Whitell	365	0	0
Jackson & Sons	340	0	0
J. Ramsbottom	330	0	0
Leach & Sons	329	0	0
SMITH & GOODWIN (accepted)	310	0	0

ENDON.

For Building Three Pairs of Semi-detached Houses at Endon, Stoke-on-Trent, for Mr. Henry Platt. Messrs. R. SCRIVENER & SONS, Architects, Hanley. Quantities not supplied.

N. Bennett, Burslem	£1,995	0	0
James Bowden, Burslem	1,620	0	0
Cornelius Cornes, Hanley	1,560	0	0
Nathan Barlow, Stoke-on-Trent	1,530	0	0
J. Heath, Endon	1,494	0	0
T. Bromage, Longton	1,476	0	0
T. GODWIN, Hanley (accepted)	1,290	0	0
William Cooke, Burslem	1,260	0	0

GRIMSBY.

For the Erection and Completion of Salvation Army Barracks Buildings, Grimsby, accommodating 1,120 Persons. Seating, Lighting, and Hot-water Heating included. Mr. J. WILLIAMS DUNFORD, Architect and Surveyor, 101 Queen Victoria Street, London, E.C.

Alderton & Wheeler, Cambridge	£1,380	0	0
W. H. Smith, Grimsby	1,300	0	0
Hewins & Goodhand, Grimsby	1,249	0	0
T. H. Burnett, Grimsby	1,182	0	0
J. White, Grimsby	1,172	10	0
T. J. Coxhead, Leytonstone	1,159	0	0
J. Leaming, Grimsby	1,130	0	0
Enderley & Co., Grimsby	1,112	6	0
H. Marrows, Grimsby	1,003	8	0
E. Good, Hull	995	0	0
Walker & Cook, Grimsby	990	0	0
F. GRANT, Cleethorpes (accepted)	920	0	0

HANLEY.

For Repairs to Property, Ashley Street and Cannon Street, for Mr. Boyce Adams. Messrs. R. SCRIVENER & SONS, Architects, Hanley.

Joseph Breeze, Stoke-on-Trent	£248	12	0
Mark Ward, Hanley	192	10	0
NATHAN BARLOW, Stoke-on-Trent (accepted)	187	0	0

For Building Crate Making Shop at Eastwood, for Mr. John Salt. Messrs. R. SCRIVENER & SONS, Architects, Hanley.

George Ellis, Hanley	£78	0	0
Thomas Godwin, Hanley	77	0	0
Cornelius Cornes, Hanley	69	10	0
John Leonard, Hanley	64	0	0
J. Bute, Hanley	60	0	0
J. T. CLARK, Hanley (accepted)	57	10	0

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G. Swan & Co., Monkwearmouth	£1,035	0	0
J. Heslop, Pitlington	837	0	0
Bulman & Robson, West Hartlepool	820	0	0
J. Tremble & Co., Hetton-le-Hole	758	13	0
P. B. Bradley, Fence Houses	777	0	0
M. Ramshaw, Haswell	753	10	0
R. Clark, Thornby	692	0	0
J. Brown, Haswell	652	0	0
J. BURN, Hartlepool (accepted)	575	0	0

HENLEY-ON-THAMES.

For Building New Offices and Premises, Reading Road, Henley-on-Thames, for Messrs. George Dunlop & Son. Mr. GEORGE W. WEBB, A.R.I.B.A., Architect, 14 Friar Street, Reading.

G. S. Lewis, Reading	£806	10	0
Bottrill & Son, Reading	760	0	0
G. Searle, Reading	747	0	0
C. Clements, Henley	746	0	0
J. Weyman, Henley	731	0	0
W. Hamilton, Henley	665	0	0
W. H. SIMONDS, Reading (accepted)	630	0	0

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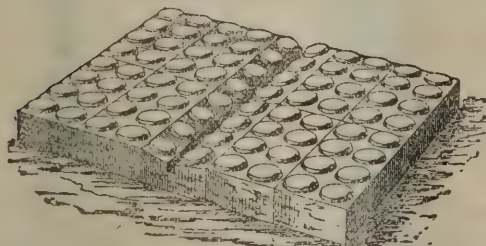
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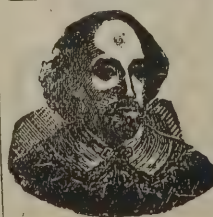
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W. H. Sarole, Worthing . . . . .	398	0	0
F. Sandell, Worthing . . . . .	360	0	0
J. F. Coxhead, Leytonstone . . . . .	348	0	0
G. Baker, Worthing . . . . .	315	0	0
Alderton & Wheeler, Cambridge . . . . .	298	0	0
C. WRIGHT, Broadwater (accepted) . . . . .	280	0	0

**TRADE NOTES.**

It is proposed to form a company for the construction of swimming baths and steam laundries at Inverness.

THE Sheffield Chambers of Commerce will meet on Tuesday next to receive a report by Mr. Abernethy, C.E., and Mr. C. Hawkesley, C.E., who were appointed to survey the route of the proposed ship canal from Sheffield to the Humber.

A SCHEME has been drawn up by Mr. J. T. Woodhouse, of Hull, for the administration of the 50,000l. given to the borough for educational purposes by Mr. Robert Hymers. After providing for site and buildings, it is estimated that there will be 30,000l. available as an endowment.

EXCAVATIONS in the nave of St. Michael's Church, Millbrook, which was restored over thirty years ago by the Duke of Bedford, have been made to form a heating chamber, with the result that one of the nave pillars and arches has collapsed. No architect apparently was called in to superintend the work.

ON Saturday, at the meeting of the Skipton Rural Sanitary Authority, in connection with the Barnoldswick water supply, it was resolved that boring operations be renewed in accordance with Mr. De Rance's recommendations. Tenders for the work are to be obtained for submission at the next meeting.

A BRIDGE in course of erection at Appleby, Westmoreland, was washed down on Sunday afternoon. The Eden was at high flood, and the newly-erected arches with the wooden centres fell with a crash into the flood.

THE Caputh Bridge over the Tay, in presence of Mr. Arrol and Mr. Tylis as representatives of the contractors, was satisfactorily tested for traffic on Friday.

EFFORTS are being made to improve the electric-lighting system in Leamington, and it is expected that three new methods of using the light for purposes of street illumination will be before the public by the end of next week.

A LOCAL Government inquiry will open at Pontefract next Wednesday, to consider the application of the Town Council for sanction to borrow 23,152l. for works of water supply.

A GANG of men engaged in cleaning the flues of the blas furnaces at Cyfarthfa Ironworks, near Merthyr, on Sunday were overcome by the vapours, causing the death of three men the lives of five others being despaired of.

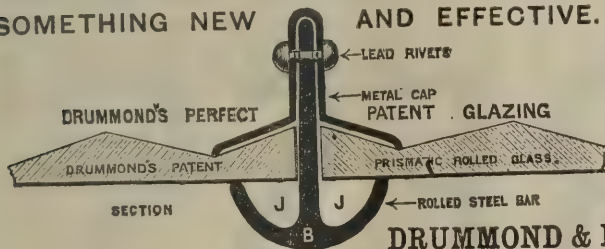
THE Infectious Diseases Hospital, Northfield, is warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester and London.

ON November 8 another penny journal will make its first appearance. *Information*, as the new comer is entitled, appeals to "all classes" for their support, and in return promises information on all subjects. With illustrated articles on "Royal Residences" and on "Early English Newspapers," copious notes on scientific and other facts, current musical and dramatic events, an able chess column, &c. &c., it seems well worth buying; and if the subsequent numbers keep up the high standard of the advance copy the new venture will obtain a large circulation.

ALTERATIONS have been made at the Guildhall, Worcester,

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embracing the ventilation, Messrs. Robert Boyle & Son's latest improved patent self-acting air-pump ventilators being adopted for the extraction of the vitiated air.

A HANDSOME and massive eagle lectern has just been presented to Ranmoor Church, Sheffield. It is entirely of polished brass, with a richly chased foliated capital and twisted shaft, supported by three lions at the base. The work has been carried out by Messrs. Hardman, Powell & Co., of Birmingham.

MESSRS. AIRD'S tender has been accepted for the Contract No. 6 of the new Manchester Waterworks. It amounts to 163,745*l.* 6*s.* 9*d.* Messrs. Knight & Co. have obtained the contract for the construction of the Prestwich reservoir, amounting to 23,297*l.*

SWIMMING BATHS are proposed to be constructed at Dorking, and a company is to be formed to obtain the funds for carrying out the work. Mr. F. J. Dibble has been appointed architect.

THE quarterly return of expenditure by the Liverpool Water Committee for the three months ending September 30, shows that 45,725*l.* 10*s.* 3*d.* has been expended in connection with the Vyrnwy works. This amount is made up as follows:—Llanwddyn embankment works and works in connection with the reservoir, 9,685*l.* 10*s.* 1*d.*; Llanwddyn quarry, 2,022*l.* 17*s.* 7*d.*; aqueduct, 29,373*l.* 18*s.* 1*d.*; land and easements, 3,257*l.* 7*s.* 8*d.*; and maintenance of the Vyrnwy estate, 1,373*l.* 16*s.* 10*d.* The total expenditure since the commencement of the works is 1,812,375*l.* 18*s.* 5*d.*

MESSRS. WRIGHT SUTCLIFFE & SON have issued a handy little book, with instructions how to fix their "National" chimney pot and "National chimney top" smoke cure, with also a valuable reprint of the testimonials received by the firm.

THE arbitration as to the amount to be paid to Captain Park Yates by the Manchester Ship Canal Company for land at Ince and Thornton required by the company concluded on Tuesday. The landowner claims upwards of 73,000*l.*, but the company contend that 26,000*l.* will be fair remuneration. The umpire, Mr. Beadel, M.P., will give his award without delay.

IT is proposed to place a stained-glass window in St. Leonard's parish church, Middleton, in memory of the late rector, the Rev. Waldegrave Brewster.

WAR OFFICE authorities contemplate a considerable extension of Warley Barracks, and the creation of a military

centre for the Eastern counties. It is rumoured that the intention is to form headquarters for an Army Corps, and to build extra barrack accommodation for five thousand men.

AN important addition has just been made to the Aberdeen Waterworks, in the two large reservoirs which have been constructed at Mannofield and Slopefield. The water storage of the town will be thus increased by thirteen million gallons. The Mannofield reservoir is 20 feet in depth and 370 feet in diameter, and is capable of containing twelve million gallons of water. The walls of the reservoir are built of granite, the bottom being filled in with concrete. The total cost has been 21,211*l.* The Slopefield reservoir, which is 270 feet in diameter and 18 feet 8 inches in depth, has storage capacity of six million gallons. The cost, including ground, has been 11,053*l.*

AT the meeting of the Works Committee of the Dundee Police Commission it was reported that Messrs. Young & Co., Glasgow, the contractors for the Fairmuir Railway extension, had come upon a large amount of rock, and that an arrangement had been made with them to bring this rock to Ninewells and construct the embankment from that point to the foot of Windsor Street, Mr. Will, the present contractor, having given up that part of his contract on consideration that he should build a parapet wall along the whole length of the embankment. The committee approved of this arrangement, by which they expect to save a considerable sum of money.

#### PRESTON PARISH CHURCH, &c.

A MEETING of seatholders was held in the vestry on Thursday of last week "to consider how best to meet the heavy extra expenses which have been incurred in the recent cleaning and renovation of the church and in effecting improvements consequent on the removal of the organ." Mr. T. Harrison Myres, architect, asked permission to make some remarks. He said: I have felt it my duty to attend this meeting to-night in response to the notice duly received, and while I hope earnestly there will be a liberal and satisfactory amount of the needful raised, I ask to be allowed to lay before you a few facts, mainly in connection with a course lately adopted by the cleaning committee. I was not aware that it was the intention of anyone in power to include in any contract such works as have been carried out until I happened to see an account—mild in its form—in a local paper of a protest against

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such. It has for some time been a parochial, nay, I may say a national, cry that the beautiful Bath stone arcade of the nave of our mother church should have received a coating of wash, to make it harmonise with the plaster walls. I call this vandalism in its true sense. I have not the pleasure of knowing any of the cleaning committee, but I should heartily have liked to have seen them whitewashed. Surely, the churchwardens and sidesmen ought not to have allowed such disfigurement to be done in this sacred building. Rather I take it to be their office to protect the fabric, and prevent any contractor spoiling the interior. My wrath at this destructive work has been intense. Let me read you a letter I have received upon this subject from one who has had great experience—a diocesan surveyor of Staffordshire, and an architect of some repute. "Stoke-upon-Trent.—My dear Myres,—When last in Preston you very kindly took me to see your fine parish church, which struck me as being well worthy of artistic respect in every way. It is a matter of regret to me to hear that the natural face of the stonework to the nave arcades has been tampered with in a way to destroy the pleasant variety of stonework in contrast to plaster facing. One does not like to be harsh in respect of the judgment of others, but this proceeding does appear to be of very questionable taste.—Yours sincerely, CHARLES LYNAM, F.R.I.B.A." I have also received another long letter of protest from the Hon. Corresponding Secretary of the Society for the Protection of Ancient Buildings, but the writer wished the contents to be regarded as private. I will just read you one or two extracts issued by the Royal Institute of British Architects:—"Hints to workmen engaged in the repairs and restoration of buildings. If directed to clean off whitewash or paint from internal or other stonework, recollect that the object of so doing is to bring to view the original surface, not to destroy it. You must, therefore, avoid the use of the tool, and study what is the best way of removing the whitewash without in any degree disturbing, much less removing, the ancient surface." You see, therefore, Mr. Chairman, we shall have great difficulty now in taking off that which has so indiscreetly been placed upon these stones by the cleaning committee. I would, therefore, suggest before money is asked for, that the whole of the colour wash be taken from the nave arcades, including the pillars, caps, and arches, at the expense of the wise committee, and then appeal to the seatholders. I should have thought that the refusal of the lay rector to allow the chancel to be touched would have given the keynote for the nave not to be touched also. Let "protection"

for the future be our motto in place of restoration or destruction. It is to prevent further desecration of this and other buildings that I have thus spoken out, but I assure you, Mr. Chairman, I must and will on all occasions speak plainly upon such a subject as the one before us. It was afterwards resolved that a voluntary rate equal in value to each sitting be laid, to be paid before Christmas. Votes of thanks to the wardens for their services and to the vicar for presiding were next accorded, and the meeting then closed.

#### LIVERPOOL THEATRES.

A SPECIAL session of the magistrates of the city of Liverpool was held in the Police Court, Dale Street, on Friday, for the purpose of considering applications for theatrical licenses for the performance of stage plays. Sir James Picton presided, and the other justices present were Admiral Gough, C.B., Dr. Costine, Alderman Samuelson, and Mr. G. Behrend. On the magistrates taking their seats, the chairman said he would, before they began business, say a word or two as to what had been previously done. They were all aware that public attention had been called to the necessity of preventing fire and panic in public places of entertainment. A committee was appointed by the Bench to examine carefully into the matter, and they had the advantage of the assistance of the engineer and surveyor to the Corporation, who went into the question thoroughly and made reports upon the subjects. The committee appointed had taken a great deal of pains both by personal inspection and the reports of professional gentlemen. A number of regulations and alterations were prescribed, which were agreed to very cheerfully and properly by the lessees of the theatres. A great many of these were carried out in a very satisfactory way, but some of these remained to be done. They would take the theatres in order. Mr. Sheldermine would refer to them, and it would be for the Bench to determine if in case the requirements were not satisfactory, whether they should give a full license now or only a provisional one until the alterations were carried out.

The applications were then heard and granted.

Admiral Gough, at the close of the business, moved the following resolution:—That the thanks of this special meeting of justices assembled for granting theatre licenses in the city should be tendered to the chairman and members of the committee who were appointed to inspect the said theatres for their

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valuable services and labours, completed with such satisfactory results.

Dr. Costine seconded the motion, which was adopted.

The Chairman, in reply, said the committee had acted in this matter with a deep sense of their responsibility. The public might now rest assured that they could go to the theatres with the full confidence that everything had been done in the way of structural alterations to prevent danger in case of fire. He would only say to the public who went to the theatres that in case of an outbreak of fire they should sit still. If they did not do so, and made a rush, they would create a panic, and if anything happened to them it would be their own fault. The theatres were now in a safe condition if reasonable precautions were taken.

#### BURNLEY TOWN HALL CLOCK.

THE clock and bells for the new town hall at Burnley, which was opened on Saturday, have been supplied by Messrs. W. Potts & Sons, of Leeds. The clock shows the time on four external dials, 7 feet  $1\frac{1}{2}$  inches each in diameter, made of skeleton cast-iron frames to form the circles, minutes, and figures, and glazed with white opal glass, behind which are patent gas-burners and reflectors. The hands are of strong copper, balanced or counterpoised within four sets of strong dial or motion wheels for carrying the hands of gunmetal, cut and polished on the engine, and mounted in strong iron frames. There are also large bevel wheels, mounted in brass bushed iron frames, also double and single universal joints of gunmetal. The clock is constructed on the solid horizontal cast-iron bed frame, the top of surface of which is planed perfectly flat, so that all the necessary fittings can be properly adjusted; there are also two index dials inside the clock-chamber to set the outside hands by, the one showing the seconds, the other the minutes, as at the Cathedral, Lincoln, the first of the kind in the country, which was designed and first brought out by Messrs. Potts & Sons, of Leeds, the makers of the town hall clock, who also made the Preston, Bolton, Rochdale, Wakefield, Hyde, New Mills, Newbury, and Lerwick Town Hall clocks. The main wheel is 15 inches in diameter of the going part, cut on the engine, and of solid gun-metal, with Lord Grimthorpe's maintaining power attached on the bolt and shutter principle for keeping the clock going during the time of winding up, and so arranged that the attendant cannot put the key on without putting the power in gear, or take the key off till power is

removed. The going part will go eight days with once winding. The escapement is the double three-legged gravity by Lord Grimthorpe, same as in use at the Parliament House, Westminster, Rochdale Town Hall, Leeds Royal Exchange, &c., and one now making for the county magistrates, for the Prestwich Asylum, Manchester, by Messrs. Potts & Sons, Leeds. This escapement, if properly made, is one of the finest ever introduced for enabling a clock to keep correct time. The pendulum is compensated with zinc and iron tubes with steel rod through the centre, and cylindrical shaped bob of about 2 cwt. beating every  $1\frac{1}{4}$  seconds, also an engraved degree plate. The striking part for the hours, large or main wheel, is of gunmetal, cut and polished on the engine, and fully 18 inches in diameter, with necessary cams attached, faced with steel, for lifting the hour hammer that strikes on the large or tenor bell of about 25 cwt. The Westminster chimes are struck on the four smaller bells, which weigh over 32 cwt. The total weight of hour and quarter-past bells altogether is 56 cwt. 1 qr. 23 lbs.

#### ALL SAINTS, WEST DULWICH.

THE foundation-stone of this church was laid on Wednesday by the Bishop of Rochester, about 900 people being present. The site of the new church is a fine piece of land given by the Governors of Dulwich College, and is most conveniently situated within five minutes' walk of the L. C. and D. Railway Station, Dulwich. It is triangular in form, and has a fall from west to east of about 28 feet. The architect has tried to utilise this very considerable fall so as to add great dignity to the east end and enhance the general effect of the church.

The main scheme of plan shows a wide and lofty nave of proportional length. There are seven double-arched bays, the shafts and main arches being carried up in red brick, with stone caps, bases, and bands; the remaining portions of walling being of yellow brick, relieved here and there with red brick and stone bands. Spaces for colour decoration are placed immediately over the lower arches, and a clerestory is formed in spandrels above. The three easternmost arches open into wide north and south aisles, which are gable-roofed. An apsidal baptistery, with north and south narthex at sides, is thrown out at the west end immediately under a row of five single windows and a large rose window in western gable. Two towers placed anglewise, and pierced with arches on all four sides, flank the great chancel

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#### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIRS.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 32 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIRS.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aguol" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly,

To Messrs. Griffiths Bros. & Co., London.

S. C. LOWE & SON.

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arch north and south. It is important to note that by this uncommon form of plan, a view of the altar is obtained by those occupying seats in the north and south aisles. The chancel, which is the same height as nave, is pentagonal in form at east end. It is divided from nave by a very lofty arch, the upper portion of which is filled with rich tracery, forming a sort of lacework of stone, carried on two slender shafts, the basis forming portion of a low chancel screen. A kind of rood screen is formed of wrought-iron, about 30 feet from nave floor, which, whilst acting as a constructional help, adds greatly to the general richness of effect. It is considered that this screen will be one of the marked features of the new church. The eastern walls of chancel will be enriched by seven lofty three-light windows, the heads being filled with tracery. An arch on the south side divides the chancel from the vestries and the organ-chamber, and another on the north side from the ambulatory and chapel and gallery for musicians or additional choir.

An ambulatory running round eastern wall forms a connection between chapel and vestries, musicians and organist. At the east end of north aisle is formed a complete chancel and sanctuary, which, together with north aisle, accommodating as it will about 200 people, forms almost a complete small church, with separate entrances for clergy and laity. This portion of the church will be heated and lighted independently of the main building. The nave floor being 28 feet above the ground level at east end, ample room is gained in the basement for a large crypt, which is designed to be used for various parochial purposes.

The main features that the architect has tried to realise in the exterior have been, firstly, loftiness throughout; secondly, to take every advantage of the fall in site to get as grand an effect as possible at the east end; thirdly, to group the principal parts of the building as picturesquely as possible.

With the means at his disposal the architect saw he could not hope to build a tower or spire of large dimensions, and therefore has designed a kind of minaret tower which, while it is in accordance with the feeling of the design generally, is sufficiently large to admit of a peal of bells. A flèche of very considerable height is placed on the centre of roof at the junction of the nave and chancel.

The church when finished will accommodate about 1,400 adults. The entire work is designed by, and is to be carried out under the superintendence of, Mr. George H. Fellowes Prynne, A.R.I.B.A., of London. The present contract only

includes the foundations of a small portion of the east end put in for the purpose of laying the foundation-stone on the eve of All Saints' Day, the contractors being Messrs. Kynock & Co.

The contract plans for the complete work are now being prepared, and the work will be proceeded with as soon as possible after the invited tenders have been received.

#### REGISTRATION OF PLUMBERS.

AT the examinations of plumbers for registration, just held at the City and Guilds Institute, applicants were present from several towns of North and South Wales, from Somerset, Stafford, and Hants, as well as from various parts of London and district. The examinations embraced tests of joint-making, lead-laying, &c., and a set of questions relating to the qualities of materials, the construction of various forms of house-fittings, and the principles of sanitation. The examiners were Messrs. Hudson, Webb, Millis, Clarke, and Lyne, the two last representing the Polytechnic Plumbing Classes and the United Operative Plumbers' Association respectively. Just half the applicants succeeded in passing the examinations.

At a meeting held yesterday at the Guildhall the Plumbers' Company issued their certificates of registration to plumbers from Bath, Battle, Brighton, Brynmawr, Burnham, Cardiff, Chester, Chippenham, Egham, Emsworth, Halifax, Hereford, Kirkby Lonsdale, Landport, Manchester, Salisbury, Sheffield, and Southampton.

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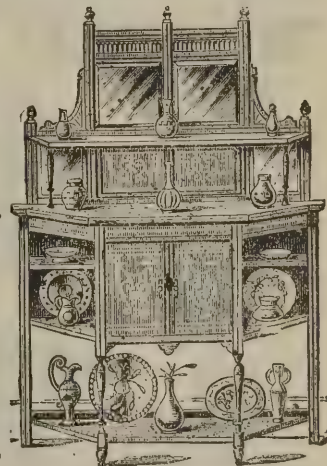
THE first ordinary general meeting of this company was held on Tuesday at Winchester House, Old Broad Street, London. Mr. D. A. T. Christie (chairman) stated that the shareholders would notice that although the company only dated from May last, the accounts had been made up as representing a whole twelve months, in order that the business might be a continuous one, with practically, if not technically, the same proprietary. It was satisfactory that the normal charges were substantially less than in the previous year, and in the current year there would be a still further reduction. The manufacturing gross profit was 28,561*l.*, or a falling off of 9,800*l.* compared with the previous year. Of this amount 1,500*l.* at least was attributable



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APPLY FOR SAMPLE CARDS AND DESCRIPTIVE CIRCULARS.



to the rise in the price of metal and the increased discounts to the trade, but the real disappointment had arisen entirely from the Continental department, especially France. They had, in consequence of certain ill-advised transactions, found it necessary to reorganise that Branch; both in France and Germany they had various local difficulties to contend against. They had during the past year, notwithstanding the falling off in the Continental department, sold 3,000 lamps in excess of the previous year. The net profit had amounted to 13,175 $\frac{1}{2}$ l., the directors had paid an interim dividend of 5 per cent., and they proposed to apply the sum of 2,000 $\frac{1}{2}$ l. in the reduction of patents and business purchase account, and to recommend a present distribution of 3d. per share, making a distribution for the year of 6 $\frac{1}{4}$  per cent on the capital. The report was adopted, and the dividend as recommended declared.

#### AMERICAN NOTES.

IN Philadelphia underground brick conduits, 8 feet high and 4 feet wide, are being constructed for the electrical wires in the main streets and avenues. In these will be 50 3-inch pipes, each containing 100 wires. One connection will be made in each block, with a main from the conduit under the house line to the middle of the block, where a tall pole will distribute wires to the rear of the houses. Powerful pumps will keep the conduits full of dry air.

It is noted by *Building* of New York that the *Sun* has published an interesting article on the architecture of residences on the west side of Central Park, and other recent additions to the more important residential structures of the city. In enumerating a number of the more impressive edifices about completed, it contains some pertinent remarks, but to our minds, *Building* says, the utility of the entire article is lost from the fact that while owners' names are given, no architect is mentioned. It is disappointing to find that an article of such merit should be spoiled by the fact that the writer passes over the most important information which the public should have, viz. the name of the author of the building he criticises.

ONE of the most satisfactory features in the completion of the twin spires of St. Patrick's Cathedral, the same journal states, is the fact that, although the work of building them above the roof level has been going on since the fall of 1885, not a single accident has happened to any person employed in

the undertaking. The spires are of white marble throughout, except that a copper rod through the centre holds the extreme upper pieces composing the finial in place. They are octagonal in form, mounted on octagonal lantern towers that rise from the level of the roof. They are the tallest church spires in America, and rank among the tallest in the world. They measure about 330 feet from the curb, while Trinity spire in this city is but 284. The spires have been erected under the supervision of the architect employed from the conception of the cathedral, Mr. James Renwick.

In an article in the *Scientific American*, by Mr. Robert E. Masters, on "Melting Iron," the following passage occurs:— I have before me about all the reports of cupola workings that have been published for several years past, and I find among them a number from men who claim, with cupolas of 35 inches to 40 inches inside diameter, and in heats of less than 18,000 pounds of iron, to be able to melt from twelve to over nineteen pounds of iron to one pound of fuel. For instance, the following figures look well on paper:—

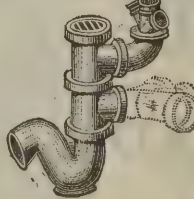
Amount of Iron Melted.	Amount of Fuel Consumed.	Ratio of Fuel to Iron Used.
17,920 pounds	1,232 pounds	1 to 14.54 pounds
9,800 "	635 "	1, 15.43 "
8,800 "	530 "	1, 16.60 "
10,700 "	610 "	1, 17.54 "
13,100 "	680 "	1, 19.26 "

Simply because I have not been able to reach these high figures, or see anyone else do it, I do not say that it cannot be done. I try to be progressive, and am a thorough advocate of any improvement in machinery or advancement in mechanical work, but I am not going to try to compel any man who is in my employ as foundry foreman to produce results in melting iron that are beyond anything I have known to be accomplished. I would like to see some of these figures demonstrated, and I am now talking to the men who claim to produce them. I will present any man with 250 dols. who will come to our works (Marshall, Texas) and melt 18,000 pounds of iron in a 38-inch cupola at a ratio of over 14 pounds of iron to one of fuel, and have the metal fluid enough to produce good, clean, solid castings for locomotives, architectural work, and machinery. These figures will give the

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one who undertakes it the highest amount of iron to melt and the lowest ratio of iron to fuel given in the above table. I will furnish as good, or better, cupola to melt in than can be found in the average foundry: good blast, first-class dry Connells-ville coke, Scotch and American pig-iron, and a regular run of car and locomotive cast scrap. All I ask is to do the weighing on the charging-floor and keep the figures jointly with the man who is to accomplish it, and I will take pleasure in publishing the results.

### AN AMERICAN CHIMNEY.

THE *Scientific American* gives a description of the great chimney recently erected at Kearney, near Newark, N. J., by the Clark Thread Company. It possesses the distinction of being the tallest chimney in America, and the fourth tallest in the world. It is the highest chimney ever built for boiler furnaces. The others that surpass it in altitude were erected for carrying off the products of chemical processes and for distributing the noxious gases produced.

The shaft is circular, and rises with a perfectly uniform batter from the bottom to the neck below the cap. Its diameter at the base is 28 feet 6 inches, and at the neck is 14 feet. This gives a batter of 7 feet 3 inches, or 2·85 inches for every 10 feet. Its total height is 335 feet. Its internal diameter is 11 feet, giving one circular flue. At the summit it expands into a well-proportioned capital surmounted by a cast-iron coping. The latter weighs 6 tons; and is composed of thirty-two sections. They are bolted together by inside flanges, so as to present a smooth exterior.

The foundation is in concrete. The ground was excavated until a layer of firm gravel was reached, 1 foot below the water. Upon this the concrete was deposited. It was composed of crushed limestone 6 parts, sand 3 parts, and German Portland cement 1 part. It is 40 feet square and 5 feet deep, forming a block of 8,000 cubic feet volume, and weighing about one million pounds.

On this the base was started, composed, like the shaft proper, of brick laid in cement mortar. For this portion, up to 4 feet above the ground, a mixture of 1½ parts sand to 1 part German Portland cement was used for the mortar. The shaft up to a height of 160 feet is laid with the following mixture:—Sand 6 parts, lime 2 parts, and cement 1 part. The sand and lime were made into mortar, and had stood three months

before use. This method of treatment is considered to improve the quality of the mortar. Just before use the cement was added. From this point up the proportion of cement was increased until, at the top, the proportions became, sand 3 parts, lime 1 part, and cement 1 part.

Two qualities of brick were used. The outer portions were of the first quality North River, and the backing up was of good quality New Jersey brick.

Every twenty feet in vertical measurement an iron ring, 4 inches wide and ¾ to 1 inch thick, placed edgewise, was built into the walls, about 8 inches from the outer circle.

As it starts from the base the chimney is double. The outer wall is 5 feet 2 inches in thickness, and inside of this is a second wall 20 inches thick and spaced off about 20 inches from main wall, and, of course, concentric with it. From the interior surface of the main wall eight buttresses are carried, nearly touching this inner or main flue wall, in order to keep it in line should it sag. The interior wall, starting with the thickness described, is gradually reduced until a height of about 90 feet is reached, when it is diminished to 8 inches. At 165 feet it ceases, and the rest of the chimney is without lining; no fire-bricks are used in the lining.

As the chimney receives two horizontal flues placed diametrically opposite to each other, a 12-inch deflecting wall is built across the vertical shaft, starting from the base and rising 16 feet. The plane of this wall is perpendicular to the axis of the flues.

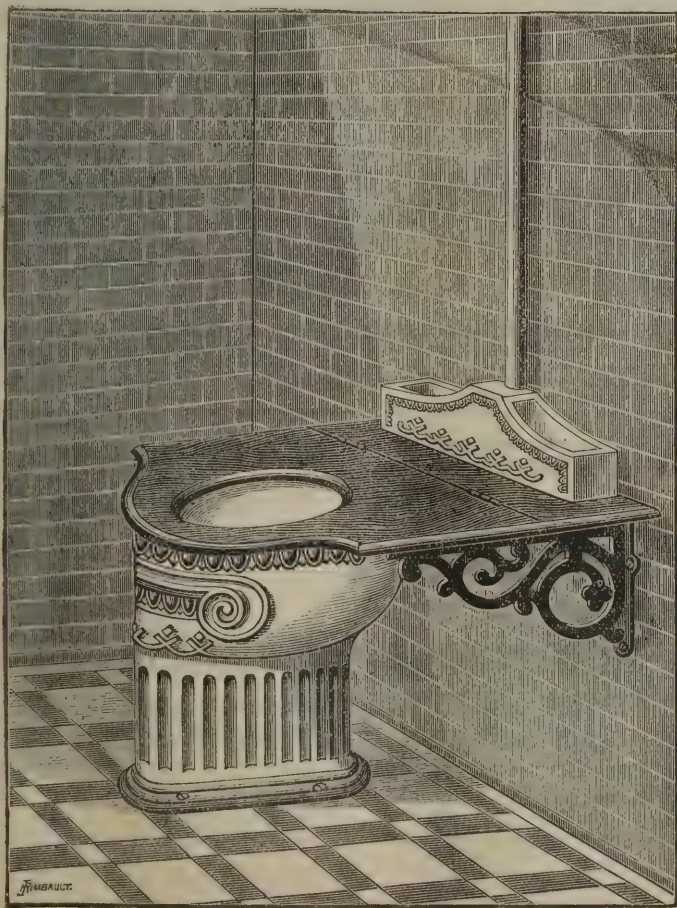
The two flues just alluded to are arched tunnels 7 feet wide and 8 feet high. An arched opening is formed for their entrance into the chimney, and a space of 2 inches is provided between the outside of the flue and the main structure. The walls of the horizontal flue as they enter the stack are 16 inches in thickness.

In these flues it is proposed to place feed-water heaters for the boilers. About one thousand pipes will be included in them. It is believed that much more of the waste heat can be economised than is usual, as, owing to the great height of the chimney, a comparatively slight heat in the products of combustion will generate ample draught. The advantage, in an engineering sense, of so large a chimney will be derived from this factor of economy.

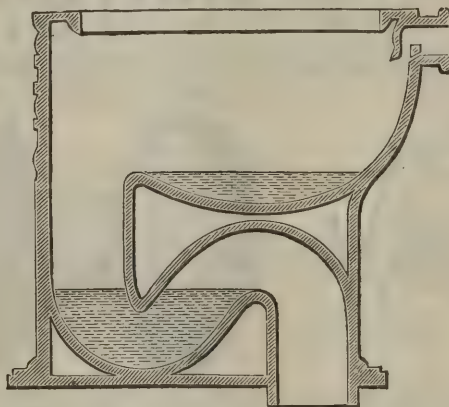
Twenty-one boilers of 200 horse-power each will depend upon the chimney.

The general methods of construction adopted were characterised by simplicity as well as by efficiency. A steam

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elevator, with a platform 3 feet 6 inches by 3 feet, was arranged to run up and down inside the shaft. It had 3,000-lbs. capacity, but never had to raise more than 800 lbs. Two uprights, 4 by 6 inches, were braced against the inside walls, and served as guides to the elevator. As the work progressed, these and other fixtures of the elevator were carried up, until finally the crane, carrying the main sheave, was above the coping nearly 340 feet from the earth. Interior scaffolds were built every few feet as the work progressed, two beams, 3 by 8 inches, being built into the walls to carry each one.

The greater part of the main shaft and lining was executed by eight bricklayers and five helpers. Their material was supplied from below by seven labourers on the ground. A system of bell and flag signals was arranged, so that no confusion could exist, and the men below could tell at once what material to send up in the elevator.

Two operations were needed to keep the chimney true. The circle had constantly to be verified or trained. By accurate plumbing a series of centre points were carried up, one being established at every 40 feet of height. From the line of those representing the axis of the shaft the training was done. The other operation was the plumbing. The batter or slope being a constant, a mason's plumb rule was planed off to give the true slope, and the sides were constantly tried with this. Both these operations were in charge of one man, who constantly was training or plumbing. By many hours of practice he acquired the art so perfectly that he never looked to the ground, his eye not ranging below the end of his rule.

Eventually the chimney was plumbed from a height of 300 feet, a 40-foot plumb-bob being used. The deviation from the vertical was practically imperceptible.

The foundation, base, and 18 feet of the shaft were built in December 1887. The work was then closed in for the winter. Operations were resumed in April 1888, and continued when the weather permitted. The brickwork was completed in September. Altogether 150 days of 9 hours each had been devoted to the construction—a remarkably short period for so great a work.

The total weight of the chimney is put at 5,000 tons, divided as follows:—

Brickwork	9,051,899 lbs.
Concrete	1,000,000 "
Ironwork	40,000 "
Total	10,091,899 lbs.

The bearing surface is 1,600 square feet, giving about 2·8 gross tons per square foot, or more exactly 6,312 lbs. The total number of bricks in the stack is 1,697,231; 201,000 were used in the base and foundation, and 66,277 in the caps.

No means are provided for ascending the chimney after the elevator is removed. Should it become necessary to do so, a balloon, with a line, can be sent up through the central flue and allowed to lose its gas and descend on the outside. This will provide means for drawing up a line of sufficient size to enable a man to ascend the shaft.

We append some dimensions of the three chimneys that exceed this one in height:—

<i>Townsend's Chimney, Glasgow, Scotland.</i>	
Height from ground to coping	454 feet
Outside diameter, at ground	32 "
" " " top	13 " 4 inches
Thickness of wall at base	5 " 7 "
Cost	£8,000

<i>Tennant &amp; Co.'s Chimney, Glasgow, Scotland.</i>	
Height from ground to coping	435 feet 6 inches.
Outside diameter, at ground	40 "
" " " top	13 " 6 "

<i>Dobson &amp; Barlow's Chimney, Bolton, England.</i>	
Height from ground to coping	367 feet 6 inches.
Octagonal in section.	
Outside diameter, at base	33 " 10 "
" " " top	13 " 2 "
Cost	£3,000

Over three years were devoted to the building of the Townsend chimney. Tennant & Co.'s was built in one year.

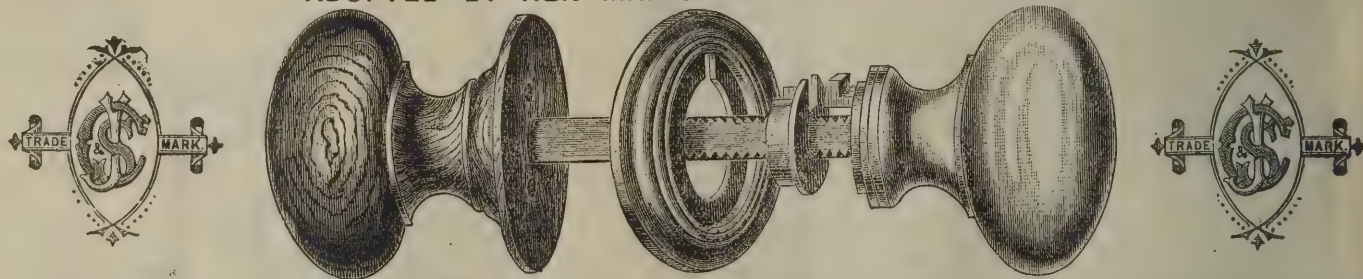
The Clark chimney was erected by the company, under the superintendence of their foreman, Mr. Cunningham. It cost 30,000 dols. The builders have allowed for about 6 inches of sway, which is about the amount of motion anticipated during a violent blow.

#### CENTRAL STATION ELECTRIC LIGHTING.

For some little time past there has been growing up on the banks of the Thames at Deptford a structure of somewhat colossal proportions for those parts, being about 200 feet square and close upon 100 feet high. This building is the combined

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engine, machinery, and boiler-house for the central lighting station of the London Electric Supply Corporation, which bids fair to be one of the most remarkable industrial establishments of the metropolis. The object is to supply London with the electric light, and to this end the corporation have laid down lines for the eventual supply of two millions of lights from this great central station, from which they will be able to convey the electric current to all parts of the metropolis. It is, however, for the future to witness the possible completion of this gigantic installation. For the present the corporation is erecting plant and machinery for the supply of 250,000 glow lamps; the building now under construction, however, will be capable of containing the necessary machinery for four times that number. Before proceeding to describe this enormous electrical plant it may be as well to note the small beginnings of which it is the outcome. Some four years since Sir Coutts Lindsay decided to light the Grosvenor Gallery by electricity, and when this became known many in the neighbourhood requested him to enlarge his proposed installation and to supply them with the electric light. This demand went on increasing, until at length a small company was formed and a large central generating station, which is known as the Grosvenor station, was built and equipped. From that station the electric current is now being supplied to some 33,000 lamps, the area covered extending from Regent's Park on the north to the River Thames on the south, and from the Royal Courts of Justice eastwards to Knightsbridge westwards. The whole of this extensive area is effectually supplied with the electric current by five separate circuits. The success thus attained only led to a greater demand for the electric light, and the small company became merged in the present corporation, which consists of a very few subscribers, who have hitherto found the necessary capital among themselves and intend to find it up to 1,000,000, that being the authorised capital.

The Deptford station is being built on a riverside site of about four acres in extent, known as Stowage Wharf, nearly the whole of which it is expected will be eventually covered by the engine and machinery houses. The buildings at present being constructed occupy a space of 210 feet by 195 feet, with a height of about 100 feet. The boiler-house, which is nearest the river, is 195 feet long by 70 feet wide, and is constructed to contain boilers of 65,000 horse-power. Of these boilers, which are of the Babcock & Wilcox tubulous type, a number are now being erected, which will supply steam for engines of 13,000 horse-power. These boilers are arranged on two floors, the

fuel store being on a third floor. The coal will be delivered from the colliers alongside a substantial wharf on the river, and will be run up in trucks by rail to the store, and delivered thence by gravity to the boiler furnaces. The engine-houses now being built are two in number, each being 195 feet long by 66 feet wide. They are separated from the boiler-house by a wall of masonry and from each other by iron columns. In the first engine-house a pair of engines of 3,000 united horse-power will be shortly erected. These engines are of the compound Corliss type, and are being supplied by Messrs. Hick, Hargreaves & Co., of Bolton, who will supply the other engines and machinery. These engines will drive two Ferranti dynamo machines, each capable of generating the current for 25,000 glow lamps. These will be by far the largest electrical generators that have yet been constructed. They will, however, be greatly eclipsed by the large dynamos which are to follow in the second engine-house. Of these there will be two sets, the dynamos being combined with the engines and driven direct. Some idea of the magnitude of these dynamos will be realised when we state that each will weigh 400 tons, and will have an armature 40 feet in diameter. Each dynamo will eventually be driven by a pair of engines of 10,000 horse-power; but at first only half that power will be developed for driving each dynamo, which will primarily supply current for 100,000 lights. When the time arrives for the creation of more lighting power each dynamo will be driven by the full power of the engine, and each will then supply current for 200,000 lamps. The further anticipated extensions will be carried out on the scale of the larger plant. The details of this great undertaking have been worked out by Mr. Ferranti, the engineer to the corporation.

The current—which is known as an alternating current, and is generated at high tension—will be conducted from Deptford to the various parts of the metropolis by means of a novel contrivance which will convey the current to a great distance without material loss, and, what is of more importance, with absolute safety, as has been proved beforehand. The current will be delivered in London at several points, where distributing stations will be established. Here the corporation will have transformers, by which the current will be converted to a lower tension, by which process it will be increased or expanded in quantity very much as compressed vapour is expanded. Thence it will be distributed to the public at a medium tension by other or subsidiary mains, and again finally converted or expanded to low tension on the premises of each.

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consumer. In all the arrangements—which we have just been afforded the opportunity of inspecting—ample provision has been made to guard against any interruption in supply that might be caused by the temporary disablement of any portion of the machinery and appliances. It is anticipated that before the end of the present year there will be in actual operation at Deptford machinery capable of supplying 50,000 lights, and by the spring of 1889 200,000 more, making, with those already being supplied by the corporation from the Grosvenor Station, a total of 283,000 lights.

#### HOUSE DRAINING.

A LECTURE was lately delivered at Northampton by Mr. T. Pridgin Teale, M.A., F.R.S., of Leeds, on "Ignorance about House Drains and its Dangers." The lecturer began by remarking that very few houses were in a state of sanitary soundness, and the only way in which this defect could be remedied was by creating a public opinion which should aid those in authority in carrying out the powers with which they were entrusted by the legislature. After stating that he had not lectured for years, and that, therefore, his views were not quite so much up with the times as they should be, the speaker went on to say that much sanitary work was needed in Northampton, as shown by the medical officer's report for 1887, in which it was stated that something like 200 houses were inspected as to the drainage system, with the result that nearly the whole of them were found to be defective. In some instances the medical officer ordered the absolute demolition of the houses, and the report added that the Sanitary Committee had visited these, and ordered that no further action be taken. This implied, said the lecturer, that either the committee had no confidence in their officer or else that they had no confidence in the support of the town. In Leeds last year seventy-six houses were closed, and many of them pulled down, owing to defects in the drainage system. There were three points, continued Mr. Teale, which he wished them to carry away. First, the result of bad drainage was that a large proportion of illnesses arose therefrom, which might be proved by medical men over and over again in the kingdom. Secondly, of houses that had not been recently built under sanitary rules, a very large proportion were wrong in their drainage. Given a house built twenty years ago, they might

almost take it for granted that the drainage was wrong. In Leeds last year 35,000 houses were superficially inspected, and 7,000 found defective; 1,100 were more thoroughly tested, and 927 of them found defective. Thirdly, the question of right or wrong sanitary arrangements in a house was a very simple one indeed when reduced to its proper factors. The wrong system that they had been submitting to in past years was a very complicated and expensive one, whereas the good system insisted upon now was very simple, and much less expensive if carried out when the house was built. Architects and builders, before they were instructed in sanitary matters, seemed to exercise their ingenuity in putting as much of the drainage as possible inside the house. The modern system was to put it all outside, where bad workmanship could do comparatively little harm. To get the work done properly the public should be instructed that they might find out for themselves the A B C of sanitary arrangement, which was not a very difficult matter to learn. The public authorities should then be charged to see that the work was carried out well. The lecturer believed that no systematic code of building laws had yet been adopted in Northampton as there had been in Leeds. He could not understand why such laws had not been made compulsory throughout England. Mr. Teale then proceeded to illustrate, by means of several large diagrams, the effects of bad drainage upon the health of a household, and showed that leaking pipes underneath a building caused the effluvia to rise and enter the house, especially in rooms where there were fires. He showed the danger arising from having sinks, baths, and lavatories connected direct with the drains, and condemned very strongly the bowl-traps, saying that the only effective method was the water-trap. The cardinal principles of sanitary arrangements were that all drains must be outside the house, and disconnected with the pipes leading thereto which should run into gullies, and have a water-trap higher up. The old-fashioned pan-closets were horrible abominations, and ought to be replaced in every instance by ordinary syphons. No drains should run under buildings except where unavoidable, in which case they should be embedded in concrete. The lecturer went on to show specimens of bad workmanship in the joints of leaden pipes in specimens furnished by Mr. Councillor Tomes, and also of cases in which foul gases had eaten holes through the convex sides of curved leaden piping. He also alluded to the grave results that might arise from an escape of effluvia through cellar drains and coming into contact with articles of food, and said that rats were often a sign of direct communica-

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tion with drains, and showed a need of remedy. He concluded by saying that all houses, and especially public buildings, should be furnished with plans of the drains, so that they might easily be found when required.

## PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

## APPLICATIONS FOR PATENTS.

15041. George James Randall and Frederick Carter, for "Hardening the faces of all soft oolites, limestone, for the purpose of enamelling same, and producing imitation marble ebonite." October 19, 1888.

15058. Wilhelm Lönholdt, for "Improved valve apparatus, serving either for ventilation or for hot-air supply." (Complete specification.) October 19, 1888.

15074. Alfred Ashmore, for "Improvements in axle pulleys and in axle pulley frames." October 20, 1888.

15132. Richard Stanfield, for "Improvements in pencils, penholders and the like." October 22, 1888.

15136. Edward Cain, for "Improvements in and relating to weather strips of doors for excluding draughts." October 22, 1888.

15142. Hugh Edwards, for "Improvements in locks and keys." October 22, 1888.

15152. James Denham, for "Improvements in brick-making." October 22, 1888.

15176. Lionel Henry Teale, for "Improvements in fire-places." October 22, 1888.

15178. Alfred Robinson, for "Improvements in apparatus in combination with water-waste preventers." October 22, 1888.

15181. Edward Seitz and Sibbett Landells, for "An improved machine for cleaning streets." October 22, 1888.

15221. Charles James Harcourt, for "Improvements in the manufacture of ventilators for oven doors and other like uses." October 23, 1888.

15223. Samuel Russell, for "Window fastening." October 23, 1888.

15235. George Hayes, for "Improvements in and relating to sheet metal lathing and the like, chiefly designed for use in the construction of fireproof buildings." (Complete specification.) October 23, 1888.

15236. John Dewrance and Bonneval Edward Church, for "Improvements in the process of cementing asbestos." October 23, 1888.

15243. John George Witte and William Lewis Witte, for "Improvements in door springs." (Complete specification.) October 23, 1888.

15267. Horace Budge and Frederick John Jackson, for "A device for preventing the opening of doors." October 23, 1888.

15271. William Thomas Leach and Charles W. J. Notte, for "A combined rule, set-square, and section-liner, for draughtsmen and others using drawing instruments." October 24, 1888.

15272. Frederick James Bantin and Charles W. J. Notte, for "Improvements in or relating to overmantels." October 24, 1888.

15278. John Bell Millar, for "Discharge and overflow for baths, sinks, lavatories and similar vessels, to be named or called 'The Luxor.'" October 24, 1888.

15355. David Richmond, for "Improvements in the construction of drain-pipes." October 25, 1888.

15361. Andrew Nicol Porteous, for "Improvements in rotary engines, applicable to water meters, pumps, and blowers." October 25, 1888.

15379. John Crosby Hargreaves and Alfred Robert Armitage, for "Improvements in firegrates." October 25, 1888.

15389. Alfred Winrow, for "Improvements in machinery for pressing or stamping tiles or bricks." October 25, 1888.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

11392. William Price and Edward Webb, for "Improvements in apparatus for gas-lighting, warming, and ventilating." August 7, 1888.

12470. Gurney Lindoe Falconar, for "An improved method of framing sash-windows, doors, or shutters." August 30, 1888.

12583. George John Bellingham, for "Improvements in portable alarm fastenings for doors or windows." September 1, 1888.

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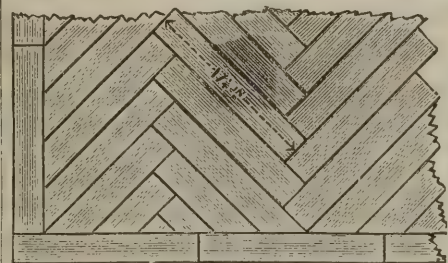
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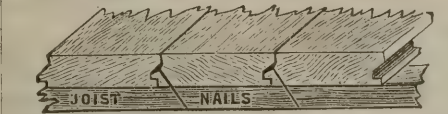
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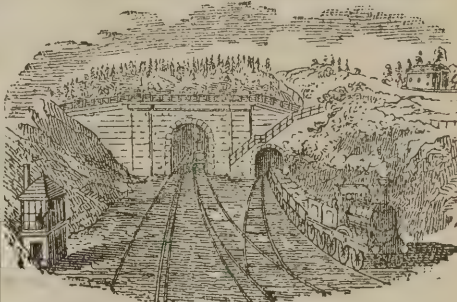
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12660. Thomas Bloomfield Secker, for "Improved automatic door-holder." September 3, 1888.

12946. Timothy Line and James Daveney, for "Improvements in wainscots and linings for walls, ceilings, and the like." September 7, 1888.

13211. Jesse Rust, for "An improved vitreous material for paving and other purposes." September 12, 1888.

13243. Andrew Turnbull and John Mathieson, of the firm of Turnbull, Mathieson & Co., for "Improvements in stoves and cooking-ranges." September 13, 1888.

13309. John Henry Abel, for "Improved spring-check, stop and alarm apparatus for doors." September 14, 1888.

13553. Franz Wengel and Wilhelm Cronmeyer, for "A novel construction or arrangement of affixable table for draughtsmen, engineers, and general drawing-board supporting purposes." September 19, 1888.

13633. William Charlesworth, for "Improvements in window fastenings." September 21, 1888.

13643. William Snelgrove, for "Improvements in circuit making and interrupting devices for electric bells and other purposes." September 21, 1888.

13696. Charles Herbert Scott, for "Improvements in brick-kilns fired by gas." September 22, 1888.

13977. Alexander de Guerra, for "Improvements in opening and closing window-sashes." September 28, 1888.

14073. Robert Hyde, for "Improved apparatus or means for raising and lowering sliding windows or sashes (or shutters) in railway-carriage, cab, or other doors, or sliding windows, or sashes or shutters in houses or buildings." October 1, 1888.

14198. Stephen Francis Smith, for "An improved combined ventilator and gas bracket for walls." October 3, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

16061. Robert Harris Reeves, for "Improvements in the construction and ventilation of soil pipes, house drains, or other sanitary fittings." November 22, 1887.

16165. Benjamin Lewin Mosely, for "Improvements in pavement kerbs, conduits, and road gutters." November 24, 1887.

16418. Frederick James Baynes, for "Hood or damper for domestic fireplaces, either for warming or cooking." November 29, 1887.

17588. Henry Arthur Ball, for "Improvements in apparatus for opening and closing fan-lights and the like." December 21, 1887.

17630. James Bingham Allcott, for "Improvements in or pertaining to the disposal of refuse of towns, and the like, by burning, utilising heat generated therefrom, and apparatus therefor." December 22, 1887.

118. Stephen Brooks, for "Improvements in and connected with smoke consuming arrangements for steam boiler and other furnaces and domestic fireplaces." January 4, 1888.

12460. Thomas de Garis Cohn, for "Improved means of fastening or securing window-sashes." August 29, 1888.

#### PATENTS SEALED, OCTOBER 26, 1888.

11300. William Green, for "Improvements in apparatus for raising water for the supply of public or private baths, street watering, flushing sewers, and other purposes." August 18, 1887.

12341. Edward Kirby, for "Improvements in window fastenings, commonly known as sash or casement fasteners." September 12, 1887.

13786. Thomas William Helliwell, for "Improvements in the means or method of fixing and making secure sheets of glass, zinc, slate, or other suitable material employed in covering the roofs, flats, or sides of railway stations, green-houses, or other structures or places where adaptable." October 12, 1887.

13885. Alfred George Wass, for "A new or improved combination of substances for the manufacture of varnish, paint, enamel, or other similar articles." October 13, 1887.

13902. Robert Punshon, for "Paving, roofing, and flooring material." October 13, 1887.

14056. John Edward Beanland, for "A new or improved hinge or connection adapted for either doors, gates, or windows, and means or method of fixing same." October 17, 1887.

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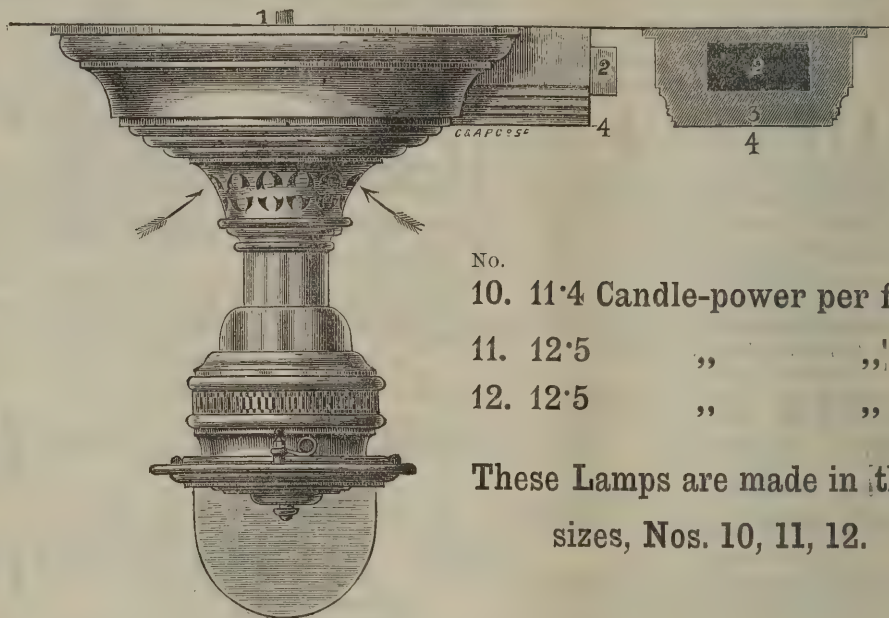
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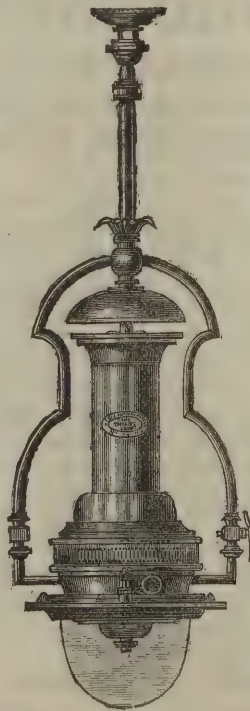
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# The Architect.

## THE WEEK.

THE address which Mr. WATERHOUSE delivered on Monday was worthy of himself. For once at the Institute there was nothing to suggest a chairman of a vestry endeavouring to give importance to very trifling things. Mr. WATERHOUSE, although a president, could not forget that he was an artist, and that artists who keep aloof from Conduit Street were to read his address. It was a suggestive address and a sympathetic one. Many a contractor will be grateful to Mr. WATERHOUSE for what he said about errors in estimates, and his recommendation that justice should be done in such cases. When so much prominence is given to a grievance there is a chance of its removal. In the same spirit was the remark about the very rigorous conditions of the travelling studentships through which six months have to be sacrificed to gain fifty pounds. In speaking of architects who died lately, the longest notice was devoted to H. H. RICHARDSON, who, by "doing exactly what he thought best for his buildings, without going out of his way to look for precedents," may be said to have imitated Mr. WATERHOUSE's practice. Often we hear it said that archæology is ruining invention in architecture, but Monday was the first time for a President to be sceptical about the advantages of eternal copying and adaptation. The subject will bear longer treatment than was possible in the peroration of an address, and we hope Mr. WATERHOUSE will hazard the experiment of giving a special discourse upon Past *versus* Present before the session closes.

THE next session of the Birmingham Architectural Association will begin on the 14th inst. with a conversazione. Mr. APPLETON will read a paper at the following meeting on "The Affiliation of Architectural Student Societies." "The Examination in Architecture and the necessary Preparation" will be the subject of a paper by Mr. F. R. FARROW. Mr. BLASHILL will also come from London to lecture on "Venice." Local support will also be given by Mr. PONTING ("Edington Church"), Mr. WALLIS ("Pompeian Art"), Mr. WARD ("Decorative Art and Fashion"), Mr. TONKS ("The Cross in Art"), MESSRS. KENDRICK and MACCONNAL ("Old Woodwork"). These, with the remaining papers, of which the subjects are not announced, are signs of the efforts now made to enhance the importance of the Society.

AN exhibition of drawings and photographs of architectural subjects and the allied arts will be opened in New York on next Christmas Eve, and closed on January 12, 1889. It is stipulated that the drawings must not have appeared before in any exhibition in the city. They are to be framed or mounted. Drawings will be received at the Fifth Avenue Galleries on December 14 and 15. The exhibition is got up by the Architectural League of New York, of which Mr. J. BEVERLY ROBINSON is president.

WE have maintained that the investigation by the Commission of the affairs of the Metropolitan Board of Works was favourable on the whole to the great body of the members. The interim report, it is now found, takes that view, for the Commissioners admit that the irregularities, so far as disclosed, affected only a small part of the Board's operations, and there was no evidence that malpractice or corruption affected the greater part of the work of the Board, which had really rendered valuable services to the metropolis. Although the conduct of the two members who represented architecture on the Board is censured, it is said there is no evidence to show that any professional employment by them induced them to act at the Board in a manner which they might not otherwise have done. The incapacity of Mr. VULLIAMY, especially during the latter years of his tenure of the office of superintending architect, is noted as contributing to the irregularities of which there were no suspicious circumstances within the cognisance of the Board. The report will be a disappointment

to many; but every one who is jealous of the honour of public bodies will be gratified at finding that the Metropolitan Board has come out so clear from the inquiry.

IN the *Nineteenth Century* for this month Mr. SHAW LEFEVRE has an article on public buildings in London, which is a glorification of his own foresight and good taste at the expense of his predecessors. The conclusion of the article is a recommendation of the project for the erection of a monumental chapel in connection with Westminster Abbey, and for the appropriation of a share of the surplus coal duties to meet the expense. One point is worth attention, viz., the control of the new building. "Every care must be taken," says Mr. SHAW LEFEVRE, "that no sectarian influences should prevail in the future use of the proposed building. It will necessarily be a part of the Abbey, but it will probably be expedient to provide that the building should be maintained or repaired, as in the case of the Chapter House, by the Government, and that the regulation respecting burials in it, or the placing of monuments there, should be subject to the approval of some Minister." In these remarks all will agree, although it would be safer to trust deans of the ARTHUR STANLEY type than a Minister with the magnanimity of Mr. AYRTON. There will also be satisfaction at finding Mr. SHAW LEFEVRE asking whether Mr. BOEHM is not being allowed too great a monopoly of work in the Abbey in this generation.

A SUM of 500,000 francs was voted by the French Chambers for the alterations of the Hôtel de Chimay, which was purchased, in 1885, for the sum of 4,300,000 francs, in order that it might afford room for the ateliers of the adjoining Ecole des Beaux-Arts. It is not easy to foresee the cost of remodelling a building with that object, and the half million of francs is found to be insufficient. In consequence, the contractors have had to diminish the number of workmen, which means carrying out a contract under a loss. It is expected that the Minister will apply for an extra vote, and as it will be bad policy if the Ecole des Beaux-Arts cannot be seen next year in a complete state, we suppose the Chambers will not object to grant the money.

ON Sunday last the French sculptor who bore an almost English name, CHARLES DE GEORGE, died in Paris in his fifty-first year. He was a native of Lyons. In 1866 he obtained the Prix de Rome as a medallist, but soon after his return he set up as a sculptor, and was rewarded by a medal in 1872. The bust of *Henri Regnault*, which forms part of the fine memorial of the painter in the Ecole des Beaux-Arts, was from his hand. His *Youth of Aristotle* gained him a first medal in 1875.

THE firm of Messrs. CROMPTON & Co. has been closely associated with the progress of electric lighting in this country. The position which the firm has attained is suggested by the contracts which Messrs. CROMPTON have undertaken. Among them we find installations in Windsor Castle, Buckingham Palace, the Law Courts in the Strand, the Glasgow Post Office, the Enfield Factory, the Bute Docks, Birmingham Town Hall, the residences of the Duke of WESTMINSTER, Mr. W. H. SMITH, Lord RANDOLPH CHURCHILL, the Attorney-General, Mr. AKERS DOUGLAS, besides factories, banks, clubs, railway stations, &c. To the lighting of the Vienna Burg Theatre, which is the most remarkable example of what can be done with the aid of electricity, Messrs. CROMPTON contributed eleven high-speed engines and eight dynamos of a thousand lights each. Their selection for that work is by itself a testimony of great value. The business of the firm is likely to be increased in proportion to the spread of electric lighting, and, owing to its present magnitude, it is now proposed to hand it over to a limited liability company that will become possessed of the plant and premises in Chelmsford and all interests in the patents which are transferable. It rarely happens that a business is in the market which offers so many advantages to investors. Electric lighting is only in its infancy, and CROMPTON & Co., Limited, should have a large and profitable share in its expansion. There are other applications of electricity which will bring additional commissions to the company.



## THE ARTS AND CRAFTS EXHIBITION.

WHEN RENÉ DESCARTES had completed his studies in one of the first schools of Europe, and was thereby ranked among the wise men of the time, he was, according to his own account, embarrassed by the number of his uncertainties and errors. He resolved to seek after wisdom in ways which were unknown to the philosophers. For that purpose he mixed with men of all conditions, believing that the knowledge which they could impart of the causes which led to success or failure in their affairs would be a better clue to what he sought than anything which was to be found in books or heard in lecture-halls. The first conclusion or sample of wisdom, or, as he would say, of philosophy, which DESCARTES derived from his new mode of study, would not meet with the approval of modern economists. He affirmed that there was less perfection in works which were made by several hands than in those which came from one master. It may seem an odd sort of axiom, and the weakest of all foundations for a new system of philosophy. But DESCARTES was not a fool, and he was able to bring forward many arguments in support of his words, and to demonstrate their importance for all men and in all times.

His system no longer rules, and what he wrote against the co-operation of "divers maitres" in a work will, in our time, be taken as a proof of its absurdity. Everywhere the principle of division of labour, which was so obnoxious to DESCARTES, is accepted as indispensable if there is to be success or, rather, profit. As we are all under its sway, it is difficult to resist the conclusion that the principle must have correspondence with the constitution of man, as seen in a developed state. Without division of labour life would hardly be possible for the majority of us—at least, in the present time, when, as SHAKESPEARE says, "a thousand actions end in one purpose."

It would be useless to ignore that, as in all things human, there are shortcomings in the system of production which now prevails in most parts of the world. A workman or workwoman becomes only a substitute for a machine; he or she can have only a partial, an infinitesimal, interest in whatever he or she helps to make, and in time may degenerate into a "thing of shreds and patches." The desire for recognition, which might be called an instinct, is denied to operatives, their personality is ignored, and they become "hands."

It is not possible to escape from these grievances, but in proportion to the difficulty is credit due to those who make the trial. It is well to show that one pair of hands can work as well in the nineteenth as in the fifteenth century, and that a workman's eyes can see a thing as a whole, and realise his own or an artist's design without any great expense for machinery. Whatever helps in that way keeps up the traditions of humanity. All the novel cannons of which we hear will not enable us to dispense with old-fashioned courage, and it will be an evil day whenever machinery makes men forget that they are endowed with the same powers as the early weavers, smiths, carpenters, and potters, and are under obligation to exercise them.

The Exhibition of the Arts and Crafts Society, which is now open in Regent Street, will reveal the strength of the opposition against what is sometimes called the "commercial system," of which one of the characteristics is production by division of labour aided by machinery, and when co-operation of that sort is not feasible and the work must be produced by one man, declines to recognise him. Evidently the opposition is well supported, for otherwise it would be impossible to bring so many fine objects together. The exhibitors may esteem themselves as a sort of forlorn hope against industrialism as it exists, but if so their attack is conducted under enviable conditions. We see no indications of self-sacrifice. The prices of the objects shown are not marked, but, as in picture-galleries, they "may be obtained from the secretary at the table," a statement suggestive of costliness. But the designers and craftsmen and the manufacturers who employed them deserve to be well paid. The Exhibition is one of the most important in our time, and to a foreign expert it would be more suggestive than some of those which were fifty times its size. He would see there evidence of the skill of English designers unlike any which came before

him in Paris, Antwerp, or Vienna, and the delicacy of the workmanship would dispel all illusions about the two left hands of Englishmen. He would see enough to fill him with apprehension about contests with such rivals. If he were a Frenchman he must believe that his philosophic countryman was right when he spoke of the advantages of having an individuality about a work, rather than tokens of a plurality with as little distinction as a cloud of atoms.

As the Arts and Crafts Exhibition is essentially one of decorative works, the visitor would do well to begin with the North Gallery, which contains many cartoons. Although wanting colour, of which the value is now esteemed, a study of the designs will form the best preparation for an examination of the remainder of the Exhibition. First, they suggest that in decoration, at least, some approach is made towards a style, or perhaps it would be more true to say there is an overstepping of the lines which were supposed to hem in styles. Take, for instance, the designs for stained-glass. Mr. BURNE-JONES's noble *David's Exhortation to Solomon concerning the Building of the Temple* is unlike any of the standard Gothic windows and equally unlike anything in Gouda or Brussels. From the importance given to the draperies, the design is more allied to Greek sculpture. But the arrangement is suggestive of Gothic, although in the figures there is a power which no Mediævalist ever cared to exhibit. Some of the figures might be compared with FRA ANGELICO's in absence of worldliness. From the number of sources to which the picture may be traced, it might be called an example of eclecticism, but of a kind that is very different to what is associated with the CARACCI, and the principle which the drawing exhibits is seen also in many objects throughout the galleries. In the figure of *St. Michael*, which is of heroic size, Mr. BURNE-JONES has had the courage to draw wings which have something of nature about them; the angel is entirely unlike the elegant posturers which are found in Italian pictures. The range of Mr. BURNE-JONES's studies is suggested by two versions of the Crucifixion. In the *Tree of Life* CHRIST is attached to a conventional tree, which, with geometric branches, occupies the entire background, and at the sides are figures of ADAM and EVE. The cartoon for the Birmingham window, probably suggested by the hymn of FORTUNATUS, "Vexilla Regis prodeunt," introduces so many spears and banners around the Cross as to make it seem like an experiment of a modern Frenchman in contrasting rigid with flowing lines.

The chalk studies from the nude, for some of the figures by Mr. HOLIDAY, are signs that the days for conventional figures are past. In his cartoons of *Ecce Homo* and *Christ Bearing the Cross*, we see a pictorial spirit, but with a recognition of the limitations of space. It is difficult, however, to understand why the arms of the Cross should be so short. Mr. SHIELDS, in his cartoons, clothes his figures in drapery which falls in broad folds. His *St. John* is admirable, the head being intellectual. Near it are a couple of figures in fresco, by Mr. AVELING GREEN, of *St. John* and *St. James*, which are painted with breadth, and cannot excite anger when seen in a church. A wide field for this sort of work exists in England. The two figures of *St. Michael* and *St. Raphael*, for Morthoe Church, by Mr. SELWYN IMAGE, show the angels in the capacious robes that are associated with apostles, and which do not appear compatible with wings at the back, or with a two-handed sword. Height is suggested by making the heads small. In these cartoons simplicity is carried to excess.

The experiments of Mr. HEYWOOD SUMNER, for the decoration of the interior of a church in Abergavenny with polychrome sgraffito, are deserving of close attention. The South Kensington experiments have raised a prejudice against sgraffito, and its use is therefore handicapped. The photographs from the building only help in indicating the position of the works, as the church is not well lighted, and we must judge of the effects from the cartoons and specimens. The artist has not hesitated to employ landscape, treating it suggestively. Conventionalism is most suited for sgraffito and avoiding attempts at detail. Two of the evangelistic symbols show how well sgraffito can be applied to that form of decoration. The "fibrous plaster silvered and tinted with lacquers" which Mr. WALTER CRANE sends, is brilliant in effect, but we fear it is the kind of decoration which would be imitated in a vulgar style, and



isolated examples would not be effective, nor would it be easy to work up to them. There are some gesso panels. One by Mr. T. W. HAY resembles an inlay in woods. Another, by Mrs. WYLIE, might, at a distance, be taken for a piece of lace. Mr. CRANE has some cabinet panels, which are Greek in spirit. But, in one way, the piano by Messrs. BROADWOOD, which is ornamented in gesso by Miss FAULKNER, is the most novel application of the material. The detail is fine and the general effect is rich. The question will arise whether the oak case could not be made to look as handsome without coating it with gesso. The piano is one of those things which could not come into existence without an organisation that has a close resemblance to division of labour. Miss FAULKNER designed and executed the decoration, but no less than ten names are given of men who were employed on the case and instrument.

The cassone which Mr. BURNE-JONES has designed and painted is an innovation. The workmanship is excellent. Mr. CHARLES LUMLEY made the chest, and the gesso-work is by Mr. OSMUND WEEKS, who is well represented in the Exhibition. The gilding is as uniform as if received in a dip, like an ordinary colour in a pottery. Comparisons will be made between the garden scenes painted on the cassone by Mr. BURNE-JONES and on a hanging cupboard by Mr. SPENCER STANHOPE, both corresponding in spirit.

The sculpture may not comprise large statues or groups, but in a decorative sense many of the works have much importance. Mr. HAMO THORNYCROFT has a small sketch in relief of his *Artemis*, which in beauty of line affords a lesson in decoration. His sketch of "The ploughman homeward plods his weary way" denotes power in general grouping. Mr. JOHN WILSON has some models of heads, which have the calmness seen in Classic works. His unfinished model of a potshaped vase, with cupids around the brim, will bear comparison with French works of that sort. Two other works, which merit to be commissioned forthwith, are the statuettes by Mr. POMEROY—*In Arcady*, a shepherd boy after cutting a reed, and the *Giotto*, a most difficult figure, ably modelled. The relief in the panel of a balcony designed by Mr. MACKMURDO, and modelled by Mr. KELLOCK BROWN, is graceful in pose and contour, but the figure is overweighted by the massive club, which is out of scale with a reclining figure. The Century Guild of Artists contribute some good panels in plaster by Mr. B. CRESWICK, one series having the "Village Blacksmith" for subject. His frieze in plaster for the Cutlers' Hall is vigorous in the action of the numerous figures, and, from the high relief, will be very effective when produced in bronze. An experiment in tinting sculpture is made by Mr. WHALL, but the tints are so delicate they are hardly appreciable in a public gallery. It is well, however, to find an attempt to solve a perplexing problem.

In architectural decoration there are two pieces of friezes filled with ornament. Mr. PHILIP WEBB has taken a suggestion from Early Greek work, and has leaves which are sharply cut, and at a height the light and shade would be more telling than is possible when seen close to the eye. Mr. MACARTNEY selects as elements some flowers, with few and large leaves, and, being tenderly modelled, form a capital frieze, and one that will be more pleasing than the stereotyped scrolls. Mr. HORSLEY has some panels in this gallery in gesso, which are skilfully designed, and in another part of the building is part of a railing by him, in which flowers in an open and in a closed state are utilised, being both novel and agreeable. In the Northern Gallery Mr. DAY has several of his designs on glass, &c., and some small panels painted on oak. But as the majority of the works in the gallery are big in size, works on a small scale are apt to be overlooked.

In the Upper Gallery they have better chance of receiving attention. A most interesting collection will be found on the walls. First we meet with the water-colour sketches by Mr. F. G. SMITH, of Messrs. CAMPBELL, SMITH & Co., for the spaces above the arches in the Council Chamber of the Guildhall, which are well adapted for the position, and tell their stories at a glance. Head and tail pieces, cleverly designed, are shown by Mr. IMAGE, Mr. HORNE, and Mr. SUMNER. Mr. DAY has several daintily drawn designs for surface decoration, with a frame of designs for the covers of magazines. Mr. WALTER CRANE's original drawings

will be welcomed, for they have rendered the State a service in popularising decorative art. In the large drawings which were prepared for the photogravure series, the painstaking elaboration will surprise people who believe that all such illustrations are dashed off or worked up in a mysterious way during the reproduction. Mr. JACOMB HOOD's name is not often seen on the title-pages of books, but the designs in the Exhibition are charming from their fancy and grouping. The timidity which is seen in parts does not detract from the originality and skilful arrangement. Mr. J. H. POLLEN has several drawings of wall and ceiling painting, which, no doubt, were surpassed in the execution of the commissions. Mr. J. R. SPENCE's *Persophone* is a well-draped figure. Mr. LETHABY has two vigorous sketches of room decoration. Mr. ROOKE and Mr. HAMILTON JACKSON have selected classic legends for some decorative designs. Mr. LONSDALE shows a sketch of part of Cardiff Castle, with his wall-paintings of historic subjects, which are so successful as to warrant further patronage of that form of art. In the gallery will also be found several examples of stained-glass, carving, needlework, &c. The value of the designer's work will be further exemplified when we notice the examples of craftsmanship.

(To be continued.)

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE first ordinary meeting of the Institute of Architects was held on Monday evening, Mr. Alfred Waterhouse, R.A., president, in the chair.

The SECRETARY announced that the absence of Mr. Blomfield, vice-president, was enforced and not voluntary, owing to illness.

Mr. MACVICAR ANDERSON read several letters referring to the passing of the new by-laws, an abstract of which is given in another column.

The PRESIDENT:—It is my duty in accordance with by-law 24 to announce that by a resolution of the Council unanimously passed on July 30 last, pursuant to by-law 23, Mr. James Ebenezer Saunders has ceased to be a member of the R.I.B.A.

#### The President's Address.

The PRESIDENT then delivered the following address:—The task of addressing you, on the opening meeting of a new session, is one which becomes to him, whoever he may be who occupies this chair, more and more difficult. The interesting *Journal of Proceedings* published by the Institute, and our many professional journals, record everything that has happened of architectural interest and moment during the year—successes achieved, new inventions likely to be of service to us, important publications, architectural meetings, and notices of members whose death we have to deplore.

When I look at the addresses given by former presidents on occasions similar to the present, I feel that I cannot hope to say much that is new on the topics which of late years have so much interested you, and which have formed the staple of such addresses, nor approach the ability with which my predecessors have handled these themes. I must ask your indulgence, therefore, if I pass with slight reference many of the questions so ably treated by them, and refer to others, which, if not equally important, have at least been to me the object of some thought.

#### The New Charter.

The most important event of our last session is undoubtedly the passing of the new by-laws under the provisions of the supplemental charter granted last year, though they have not even yet received the approval of the Privy Council. The chief feature of this new instrument is the examination (no longer voluntary, but obligatory) through which for the future the ranks of our Associates will have to be recruited. I look upon this as an immense stride in the right direction, first as an incentive to the student to study, and, secondly, as showing him the direction in which he ought to study, pointing out to him the sources from which he can acquire the knowledge necessary to pass the examination with credit to himself. There has hitherto been, from what I have seen of architectural pupils, not so much a want of will to study diligently as an uncertainty as to the way. The way is now made clear, and from the commencement of his articles the student of the future will know, if he cares to know, what he has to make for and accomplish before he can be recognised either by himself or others as one fit to practise as an architect. This is likely to be of incalculable advantage to our profession, and we owe a debt of gratitude to those who have so long and so earnestly laboured to establish these examinations, and to perfect the



machinery by which they are conducted. May they go on in this good work, gradually raising the standard of requirements, so that in time the examination for admission may completely satisfy the public that those who have passed it are men armed at all points, and ready, so far as their intellectual acquirements are concerned, to do credit to their position as Associates and future Fellows of the Royal Institute of British Architects.

A president of the Architectural Association said, in a recent address, that "the recognition of our profession depends upon each individual one of us." This is most true, and, if lived up to, would incline us, perhaps, to think less of "registration," the advantages of which have been much debated during the past year, some architects thinking it of great importance, and others being strongly of a different opinion. As is well-known to you, an ill-timed, and to my mind most uncalled for, Bill was introduced into Parliament last session, by means of which architects, engineers and surveyors were all unceremoniously to be huddled together in one Act of registration. The Bill would, if carried, instead of narrowing the several professions interested to their most competent members only, have tended, for a generation at any rate, to injuriously widen them by giving a certain legal status to those who otherwise could have no claim as fit to practise in any of them, and in this way would have done incalculable mischief. The Bill was vigorously opposed by the recognised representative bodies of all three professions, and, after a brief but satisfactory debate on the second reading in the House of Commons, was withdrawn; not, however, so far as we were concerned, before considerable trouble and expense had been incurred. The whole scheme was, in my humble opinion, a beginning at the wrong end. Education is what we want—not registration. To the student I would say, prepare for the Institute examination so as to pass it creditably without resort to cram, and so become Associates and Fellows of this body. You will then be registered architects in an effective use of the term. In my opinion we want no other registration, and ought to be content with nothing short of this. We older men, who had none of these advantages, and find ourselves, perhaps, too rusty to pass the ordeal, must be content to offer our experience in lieu of it, and get on as best we may. Our younger brethren have a brighter future before them. The number of students passing last session (sixty-eight) encourages me to believe that they are beginning to appreciate their opportunities.

The article by Mr. Connon, published in our *Journal of Proceedings* in November of last year, is a most valuable contribution to this subject, though, for my part, I should be inclined to try the result of the present examinations for entrance into this body before calling for the compulsory education of all architects. It may at last have to come to that, and then, of course, registration will follow. Let us, in the meanwhile, have as large a body of competent architects to register as possible. The more we have, the more we are likely to have; for, if apathy is contagious at present, the example of successful application towards the attainment of a definite aim will be contagious also. The entreaties of the master have often less effect upon a naturally indifferent pupil than the example of his fellows.

The other subject, somewhat allied to these questions, which was confided to the care of the Institute by the general conference of last year—that of federation—was most thoroughly considered by the committee appointed for the purpose. Their recommendations were adopted by the Council, and a series of by-laws authorising the alliance of any non-metropolitan architectural society in the United Kingdom, India, and the colonies with the Institute, under certain regulations, is the result.

#### *Municipal and Provincial Improvements.*

The new Local Government Act has not made any provision for the proper examination of technical officers employed by the urban and rural authorities. Surveyors have hitherto qualified for certain appointments by examinations held under the direction of a Board of Examiners of this Institute—a proceeding which has worked well, and been of great public service. Your Council have done their utmost, both while the Bill was under consideration in the Commons, and also in the Lords, to call the attention of those responsible for it to this defect, but without success, probably owing to the haste with which it was hurried through its later stages. It is to be hoped that if in the future the Act comes to be further amended and enlarged, as we are promised that it shall be, our recommendations will be listened to. Such a provision has been made to secure the proper qualification of medical officers to be employed by the county councils, and it is obvious that the surveyors, urban and rural, so employed should also be persons whose fitness for the very important duties they are called upon to perform has been in every case properly attested.

The Imperial Institute building is making progress under the skilful superintendence of Mr. Colcutt, and promises, when complete, to be a very imposing structure. Our late lamented President implied in his last address that, except that it were

considered that the President of the Royal Academy (our Honorary Associate) represented architecture as well as painting and sculpture (and so he does, and most ably), the representation of architecture was conspicuously absent on the Executive Council of the Imperial Institute; but I have now good hope that architecture will be represented on it, for such a representation is likely to be of much service both to our colonies and to the profession at home and abroad. Mr. l'Anson's suggestion that the Imperial Institute might fitly collect a complete record of the architectural wonders of our Indian Empire appeared to be most valuable, and I trust it will be at the right time brought before the notice of its Executive.

In this case we may congratulate ourselves on being likely to have a public building which will be fairly seen at any rate on two sides, though, had it been placed on the north side of a square instead of being set back from a road 90 feet wide, its effect would have been enormously enhanced. The idea of sacrificing anything in the way of space for the sake of architectural splendour and effect seems foreign to the English nature; at any rate, our best sites are rarely if ever preserved for our most elaborate efforts, owing, I suppose, to there being no supreme special authority to decide such questions. It does not appear to be generally appreciated that an elaborate design ought to have a southern aspect if its beauties are to be fully enjoyed, and as a building's site is almost invariably determined upon before its architect is chosen (except in the case of private dwellings), there is at present nothing for us but making the best of what are often unworthy positions. If we go abroad we at once see that things are better ordered in this respect. Look at the Palais de Justice of Brussels. Its commanding position on the crest of a hill overhanging the old town, the open spaces which surround it, its magnificent Salle des Pas-Perdus, its stately staircases in the Salle itself, and that leading up to it from the lower town, whatever may be thought of the design of the building itself, show the advantages which have been secured by allowing ample space, both within and without, for architectural display, and to what good purpose the skilful architect has turned them, internally at any rate, in securing artistic effect. It is instructive also to note that the cost of so noble a work should be defrayed by so small a country as Belgium—a cost equal, if I remember rightly, to about 1*l.* per head of the entire population.

Vienna also sets an example for imitation in this respect. The demolition of her ancient fortifications has given her a splendid opportunity for the erection of magnificent buildings on worthy sites (as we had on our Embankment), and to good purpose she appears to be putting those sites. If we examine the plan of the Parliament Houses, designed by our Royal Gold Medallist of this year, Baron von Hansen, we shall have an instance of this. There is a generous stateliness about the building which it does not often fall to the lot of an English architect to be able to achieve. Contrast this with our own Palace of Justice, jammed in on every side (for the present unoccupied ground on the west is, I believe, reserved for the building's extension). In Brussels or Vienna they would have had wider and better-lighted corridors; but these advantages would have involved extra space, and of this there was none on the restricted Law Courts' site without giving up some of the accommodation demanded. It is impossible adequately to see the building from any side. The improved approaches to it from the north have yet to be made.

On the other hand, the domestic buildings of this country are without rivals elsewhere. Compare an English country house, erected from the designs of any of our architects who have made themselves a reputation for such work, with a modern French château—even with the published ideal of Viollet-le-Duc—and the superiority of the English work is evident; and not only in sanitary appliances is this superiority apparent, but the arrangements of plan to promote comfort and the air of homeliness which pervades the vast majority of modern English houses, have, I believe, never been approached in former times or in any other country. America may be very near us in this matter. She has certainly surpassed Europe in the originality and boldness of some of her buildings for other purposes, but the English home is still unrivalled in its quiet attractions. One can hardly leave the home without a word about the garden which surrounds it, and which adds so much to its charm. If those of us who devote our attention to Domestic architecture were to make more of a study of landscape gardening than we do, I believe that there would be more complete harmony between the house and its surroundings than is now often the case; while to the architect himself there can hardly be a more delightful change of occupation than to turn from the disappointments inseparable from building operations, to the development of those surroundings in which Nature is to play her part; as those know from experience whose clients have sought their advice in the garden as well as in the house. In the *Journal of Proceedings* we have been recommended on the one hand to turn to the grand



style—that is, the formal garden of the seventeenth century ; on the other, to give a free hand to the picturesque. But what may suit one house and one site may not suit another. In my opinion, advantage would result if we cared to qualify ourselves to give an intelligent opinion on what may add so immensely to the attractions of our work as architects, or do so much to ruin its effect.

#### *City and Town Planning.*

To return from country to town. The schemes for the improvement of communication in London too often leave much to be desired. The properties adjacent to those actually interfered with by such new thoroughfares should, if possible, also be scheduled where necessary to secure eligible building sites ; and so prevent difficulties of light and air, do away with jobbing, and give the public some more adequate return for the cost of a new street. Instead of which, building plots on the streets recently made through the heart of London have been too much composed merely of frontage, with rookeries of dilapidated tenements in the rear, whose proprietors through their representatives have reaped a harvest of compensation for injured lights.

The effect of new streets upon the adjacent existing architecture ought also to be most carefully considered, and, if unsatisfactory, some means should be taken to mitigate the awkward blemishes thus occasioned. The way in which the southern end of Shaftesbury Avenue has destroyed one of the segments of Piccadilly Circus is unfortunate, however welcome the open space thus created may be in itself. The erection of a statue, which appears to have been contemplated, on the triangular island west of the avenue would do little or nothing to remedy the now somewhat unpleasant grouping of the surrounding buildings ; but three plane-trees planted at the corners of the island would, by their soft outlines, obliterate, in a measure at any rate, the architectural discord which has been created, and add a charm to a somewhat meaningless open space. They would not, of course, prevent the erection of a group of statuary or a fountain in the centre.

Members of the Institute have, from time to time, made very pertinent remarks on the subject of our unfair and oppressive law with regard to the rights which one neighbour may acquire over another's property by putting out windows overlooking the latter, and so restricting its use as a building site. This is pre-eminently a subject for the attention of the Institute ; and surely, if it were gone about in the right way and with sufficient energy, an Act might be passed removing, to a certain extent at any rate, one of the greatest sources of annoyance and expense incident to building in towns. We know that in Scotland no such vexatious restrictions exist. I believe in America there is similar freedom. In France, too, the difficulties of the building owner are as nothing compared to what they are with us, though he is subject to the very proper regulation that the extreme elevations of buildings lining streets should bear a certain proportion to the width of the street. The unreasonable enjoyment of light which a dominant owner may have been blessed with for a certain period, simply because his neighbour has delayed the exercise of his own rights during that period, should be no cause, it appears to me, why he should be left in undisturbed possession of such unreasonable enjoyment for ever, to the detriment of his neighbour and his successors. Unfortunately the length of time that the present law on the subject has run presents serious but, I trust, not insuperable difficulties in the way of an alteration for the better.

But though we may long for this, there is something to be said on the other side. As artists, we must often have to deplore the excessive height to which our buildings have been allowed to go when unrestricted by questions of light and air—not so much on their own account, perhaps, as because of their injury to neighbouring buildings. The effect of many a fair and beautifully proportioned building of modest height has been utterly destroyed by the overgrowth of some upstart by its side ; and though we may not always be able to control our clients in this respect, I feel sure that no true artist would willingly by his own work injure that of another. Nor are architects the only offenders against good taste in this respect. There are works of sculpture which, I think, are on too gigantic a scale for their surroundings. Nobody who observes these things would regret if His Majesty George IV. were not so prominent an object when seen in front of St. Martin's Church, of which it destroys the scale ; and the same may be said of other monuments in the vicinity. In contrast, I would call attention to the old statue of Charles I. and to that of General Gordon, by Mr. Thornycroft, just erected in the centre of Trafalgar Square. The figure here is but 9 feet 6 inches high, and the pedestal, the object of evident consideration on the part of the sculptor, is correspondingly modest in size. The statue does not fail to attract due attention, though it cannot be said to dwarf anything in its neighbourhood.

#### *Professional Losses.*

During the past year we have had to lament, and do still lament, the death of several influential members of this Society.

January was a fatal month. George Godwin, the founder of the bursary for the study of modern architecture, a prominent figure in the architectural world for nearly fifty years, and an active member of the Royal Commission on the Housing of the Poor, died on the 27th ; our president, Mr. P'Anson, on the 30th ; and M. Questel, our corresponding member, and the senior architect academicien of the Institut de France, on the same day. Our late President, like Street, died during his term of office. He was seventy-six, looked back upon more than half a century of practice, and was universally respected and held in honour by all who knew him.

Then there was Edmund Woodthorpe. Though by the measure of years he had attained the age of seventy-five, he was the most juvenile among us whenever he appeared. Long will his joyous tones and genial wit dwell in our memories, and make us lament the removal of so young and elastic a spirit.

Joseph Clarke, past vice-president, whose death I have also to record, was identified with the Gothic revival by his numerous churches, the active part he took in the establishment of the Architectural Museum, and the unflagging energy with which he promoted its interests.

Nor must I omit the name of Richard Popplewell Pullan from the list of our losses. He and I sat side by side as fellow-pupils of Mr. Lane of Manchester. He then showed his powers as an artist, and his great interest in ecclesiology and kindred subjects. His practice as an architect was not great, but he devoted himself with enthusiasm and success to archaeological pursuits. His works in conjunction with M. Texier on ancient remains in Asia Minor, and on Byzantine architecture, are of lasting value. We are indebted to him also for the publication of some of the drawings left by his brother-in-law, William Burges.

The Institute has also lost Mr. T. Gambier Parry, who had been an honorary member since 1865, and whose services to architecture and the subsidiary arts were of a high order. His latest literary work, entitled "The Ministry of Fine Art," and published in 1886, is a series of thoughtful essays on subjects which their author was peculiarly fitted to discuss. Another death, that of John Pennethorne, who first detected the horizontal curves of the Parthenon, and to whose memory a just tribute has been paid by Mr. Penrose, occurred in January of the current year.

Our sympathy must be offered to our Scotch brethren in the recent loss of one of their most prominent members, James Sellars, president of the Glasgow Institute of Architects. He died comparatively young, but not before having made his mark in his native city (the International Exhibition buildings being one of his latest successes). His high character and engaging kindness of manner made him hosts of friends to lament the premature shortening of a career in which he had already done so much so worthily.

#### *Individual Influence on Architecture.*

The biographies of two of our most remarkable modern architects, which have both appeared since November last, are of great interest. George Edmund Street's Life, by his son, has about it an unusual freshness and charm, arising partly from the father's marked individuality of character, and partly from the skill with which the materials for his life have been put together. In amazing power and energy, love of work, beauty of draughtsmanship, and skill as a designer, he can hardly have had his equal. His sterling honesty of purpose and kindness of nature, even if occasionally hidden behind a determined manner, endeared him to those who knew him best. He was the most thorough and consistent supporter of revived Mediæval architecture throughout his remarkable career—a career full of interest to every architect from the days of his pupilage under Carter to his burial in Westminster Abbey. His presidential address from this chair is probably the most outspoken we have ever listened to. His lectures as professor of architecture at the Royal Academy supplement his life, and should be in the hands of every student.

The other biography I would allude to is that of a very different but also very remarkable man, Henry Hobson Richardson, of Boston, U.S.A., an honorary corresponding member. Street was the king of draughtsmen, and drew every detail of his innumerable buildings himself. Richardson, on the other hand, was supposed never to have designed one of his later and more perfect buildings with his own hands, yet no architect ever put his name to structures which were more unmistakably his own creation. Street made the pointed arch the keynote of all his construction ; Richardson saw the capabilities of the round arch, and his work in great measure was based upon Romanesque, though he treated it in his own original fashion. His works are so remarkable that I feel sure you will allow me to say a little more on a subject which has for me a singular fascination.

Richardson was a student of the Ecole des Beaux-Arts. He remained in Paris six years, working as a student and draughtsman, for he had to earn a living as well as to study, and lived practically two lives in one. In those days his great ambition



was to go to Athens and Rome. He never, in fact, went to either, and, in spite of his training, never was architect less influenced by what these two centres of past art would have had to teach him. On his return to America in 1866 his first designs were in thirteenth-century Gothic, and in no way remarkable. But in 1870 he gained in competition the execution of Brattle Square Church in Boston, a building remarkable for its campanile with deep sculptured frieze, a tower so original as to be like nothing he could have seen or heard of elsewhere, though it has about it a certain Romanesque air. The neighbouring Trinity Church followed soon after, with a central tower of excellent proportions, both in itself and as part of the composition of which it was, of course, the crowning feature. In construction it is no less bold than its detail is beautiful. Its weight of 8,500 tons is supported by four granite piers with a collective area of 100 square feet. His public libraries, of which he built several, have a family likeness in their plan and style, though each proclaims its distinctive character. His Pittsburg Court House, Field's Chicago Buildings, and Cincinnati Chamber of Commerce are buildings of a monumental character, and give evidence of an original creative mind, free from prejudice and unfettered by precedent. Richardson's peculiarities may be seen in all. These peculiarities appear to be chiefly the discarding of the Orders, the Romanesque feeling, admirable planning, appearance of strength and solidity, the value put upon mere wall surface whenever attainable, the treatment of this surface by the varied coursing of the stonework, and the contrast between tooled and rough surfaces; the use of coloured materials, especially of stone of different hues; battered bases, sparing use of string-courses, the introduction of deep vousoirs, the rounding of salient angles, and a leaning to circular forms on plan. In his later work his corbels are rounded and covered with delicate incised carving instead of mouldings, and his capitals are convex rather than concave. All these peculiarities appear to be based on sound judgment, and to be excellent in every way. On the other hand, if criticism were in such a case allowable, there seems, to my eye, almost an affectation in the shortness of some of his columns, and want of height in many of his circular archways. There is something ungainly in the upper part of transomed windows being made wider than they are high. It is also to be regretted that in many of his buildings the ridge and hip tiles and gable finials appear to be so heavy as to dwarf the general effect. In 1882 Richardson visited for the first time Southern France, Northern Italy, and Northern Spain, and only then saw the best specimens of the architecture from which he drew his inspiration. The effect of this tour, though he allowed himself no time for sketching, is visible in the works he executed in the short time afterwards left him. His becoming so devoted to, and so skilful an originator in a style, the best examples of which he had not seen, is in itself extraordinary, unless, indeed, a Romanesque wave had affected the American architectural mind before his advent. He seems to have created a new-born interest in architecture in America, perhaps by doing exactly what he thought best suited to the expression of his buildings, without going out of his way to look for precedents. In consequence, his work is never commonplace. He has left behind him a school of young Americans who appear to be following his steps in developing the capabilities of Romanesque art—an art which we must bear in mind did not die of inherent weakness, but was extinguished before its time in the twelfth century by the difficulties of vaulting oblong spaces, and the consequent introduction of the pointed arch. I have, perhaps, said enough to show that Richardson's Life, by Mrs. Van Rensselaer, illustrated by photographs of his works, is worthy of earnest study.

#### *Architectural Literature.*

An appeal has just been issued by M. César Daly to his brother architects of France, England, and America, in favour of what he calls the "Hautes-Etudes." He would have those who are interested in, and gifted for the work, seek for the causes which have affected architecture in different times and places, and given it its varied outward development. He is sanguine that such search for first principles would lead to progress, and tend to check pure archaeological work on the one hand, and irrational eclecticism on the other, which he describes as the pillage, more or less skilful, of old monuments, but not the conservation of great traditions. He condemns the present fashion of following our individual tastes, each architect being a law unto himself, and laments that Duc's prize for an "Essay to determine the style and form of modern architecture" has not been properly competed for. The "Hautes-Etudes," if set about in earnest, ought to do much to remedy these and other evils so eloquently set forth in the appeal. M. Daly proposes an International Congress of Architects to be held in Paris next year during the great Centenary Exhibition, for the purpose of considering these higher questions. All must heartily wish him success in these his persistent endeavours to advance our art by a deeper and more systematic study of its principles.

Of new publications within the year I must mention Professor Hayter Lewis's "Holy Places of Jerusalem," which will appeal to various classes of readers. By his intimate acquaintance with the authors, ancient and modern, whose works bear on the subject, and by his conscientious study, on the spot, of buildings which illustrate his theories, the writer has produced a work of unusual interest.

Mr. R. Phené Spiers's book on "Architectural Drawing" has brought a valuable addition to the architect's library. His subject is handled with such care and thoroughness that draughtsmen must find in his letterpress and illustrations much to interest and instruct.

Mr. Alexander Graham and Mr. H. S. Ashbee, in their "Travels in Tunisia," describe a ruined country in lively, fascinating style. The work is replete with valuable information, not only on architectural and archaeological subjects, but on the everyday matters of life and ordinary commerce. They give also an excellent bibliography of the country they describe, and their book is a guide of great value to the traveller in search not only of general knowledge, but of a deeper acquaintance with the remains of Roman civilisation in an important part of northern Africa than falls to the lot of the ordinary tourist.

Our profession being, in an especial degree, among the fine arts, based upon the study of the past, the value of historical research respecting it, and of pictorial reproduction of the works of great masters, can hardly be overrated; and I am therefore induced to mention a large folio work\* upon which our esteemed member, Baron de Geymüller, in concert with other distinguished men, is now engaged. It is proposed to do, under his superintendence, for Tuscany what has already been done for the Renaissance works of Rome, in the illustration and analysis of great public and private buildings. Baron de Geymüller has presented to the library the first two numbers, and our *Journal of Proceedings* will, from time to time, contain detailed notices of this valuable work.

Of the numberless exhibitions of the year, that of the Arts and Crafts is one to which we may give a most cordial welcome. It brings into notice those arts to which the ordinary picture exhibition turns the cold shoulder, and which, delightful in themselves, are essential to the architect. The decorative artist and the art workman have, within the walls of this exhibition, an opportunity at length afforded them of making themselves known to a wider and appreciative public.

The important questions to which I have been alluding—the direction and design of new streets, the law of light and air, the heights of new buildings and their relation to the width of the street—are all subjects pre-eminently fit to be submitted at no distant date for the consideration of the new Council of the County of London, of which I am glad to think our distinguished Hon. Fellow, the Duke of Westminster, is to be the first Lord-Lieutenant. There are, however, other questions of like importance as far as we architects are concerned, which we can, if we choose, of our own will settle, or at least bring to such a point as will conduce to a future settlement, when our profession is perhaps in a more homogeneous condition than it is at present, and when uniformity of professional practice will be regarded as necessary to the position and welfare of the members of a liberal profession.

#### *Architectural Etiquette.*

My predecessor, in his first address to you, gentlemen, from this chair, urged us to remember that the Institute and the profession are in principle one and the same force, inseparable and indistinguishable one from the other. I entirely agree with the proposition, and in my opinion the first duty of the Institute is to guard the honour of the profession, to take care that its members do nothing derogatory to their professional character, or, at the worst, that they shall not do so with impunity. I am not now alluding to illicit or surreptitious commissions or allowances, or of the offers sometimes made of something by way of consideration for employing certain people or their wares on our clients' works. I trust that, owing to the powers vested in the Institute and the right feeling of its members, such malpractices are of the past. I mean that when any of us undertake duties of public trust, whether it be in an honorary or a paid capacity, in any office or on any council or board, we ought to scrupulously avoid using our position for any private ends or gains, whether as professional men or as individuals. In an address delivered nearly ten years ago from this chair, at the opening of the session for 1879-80, the late Mr. Whichcord referred to the Metropolitan Board of Works and the professional men who might be members of it in the following terms:—"Architects," he said, "may be elected members of that Board just as barristers, solicitors, and doctors may be so elected. It would be ridiculous to say that professional men shall not sit at that Board because they may have had a pecuniary interest in some of its building transactions. But I shall run no risk of censure

\* *Architektur der Renaissance in Toscana nach den werken der meister geordnet.*



when I say that a Fellow or an Associate of this Institute, if he be elected a member of the Metropolitan Board of Works, ought not from that moment to have any professional connection whatever with the purchase of land offered for sale or lease by the Board; nor should he be professionally engaged in the superintendence of buildings to be erected on land which is the property of ratepayers whose agent and representative he is." The late Mr. Street in 1881 repeated those words, as I have just done; and I cannot but think that the advice they offer, or the warning they convey, may be advantageously studied by all who aspire to sit on the County Councils that are about to be summoned under the provisions of the new Local Government Act. If the Institute is still to flourish—if the character of the profession is to be maintained—it must be by jealously raising the standard of conduct of the individual members rather than allowing it to be lowered through the indulgence of any good-natured laxity.

We need not despair of success in stamping out abuses if only we are convinced of the necessity of so doing, and are earnest in the endeavour. Something, at least, has been done within the last few years to render architectural competition less liable to unfairness and jobbery than before. It is now well understood that there is one man who must not under any circumstances undertake the office of architect to the building competed for, and that is the assessor. Nothing would be easier for an assessor than to play cuckoo to the poor hedge-sparrows of competitors, who are pretty much at his mercy, and nothing obviously more unfair. But such an abuse, if it has occurred, may now be considered a thing of the past.

#### *Quantities and Contracts.*

There is another point of professional practice in which we might probably see more justice done than at present. We are in the habit of regarding the bills of quantities issued to competing builders as final instruments incapable of containing error, unless the successful builder finds it out between the day on which he sends in his estimate and the day on which he signs the contract, which may be the day after. Are we in these matters as scrupulous as we ought to be that justice be done to the builder? His lot, owing to the severity of the competition to which he is generally subjected, is a sufficiently hard one without our making him practically responsible for other men's errors. Our Scotch brethren measure up the work after completion, though competed for in the ordinary way on preliminary bills of quantities. If we are not prepared for that, let us at least be willing to allow for the correction for errors in taking out the quantities, when it is obvious that omissions have been made. Some few architects are in the habit of telling their clients that they must not hold their surveyor personally responsible for the correctness of his quantities, but that he is a man of position, will do his work with the greatest care, and allow no margin for contingencies. I have rarely met with an employer who failed to see the justice and even advantage of such an arrangement. There would be obvious convenience in uniformity of usage in this matter and in other points of professional practice also: for instance, I believe great divergence of opinion exists as to whether an architect is bound to give more than one set of drawings, or of tracings of his drawings, for the use of the works. I have until lately adhered to the view that he is not, but the great facility now offered by the ferro-prussiate sun-printing and other kindred processes enabling us to reproduce any number of copies of a tracing without the possibility of error, and thus saving all trouble of examination, seems to put this question in a new light. I am of opinion that the Institute might suggest a mode by which a somewhat more generous supply of facsimiles of the contract and detail drawings might be supplied gratis to the contractor with little more expense to the architect than at present. Two things are obvious, the necessity of receiving payment from the builder for additional copies of drawings should be done away with, and uniformity of practice in this matter should be aimed at. It is known that, in France, where, owing to the great number of independent contractors employed on the same work, the reduplication of drawings is a more serious affair than with us, the architect, nevertheless, considers it part of his duty to supply them all without extra charge. The great number of drawings required by municipal and other corporate authorities is also a considerable tax upon us or our clients, and it would be well if such bodies could be persuaded to take mounted sun copies instead of tracings on cloth.

Then there is the desirability of a more general application of the arbitration clauses (Nos. 20 and 21) of the heads of conditions of building contracts sanctioned by the Institute and agreed to with the representative builders of the country. I know that there are architects who put in the building contracts they make, as the agents of their employer, a clause to the effect that the architect is to be sole judge, arbitrator, or umpire in any dispute which may arise between the two parties—the architect, as the agent of his employer, being one

of the said parties; and I know that there are builders—sharp, shrewd, and alive, nevertheless, to their own interests—who are willing to put their names to such documents; but it is a practice of doubtful expediency, and I urge upon the young men who are here to-night, before they impose arbitrary conditions of the kind, to reflect that no man can be fairly or safely judge and party in the same case.

#### *Architectural Study.*

We have heard something lately of the conflicting terms "professional man" and "artist" as applied to the architect. Now in my opinion the true architect is both. The higher and more systematic education, which we are hoping for and getting, will train us in the efficient and easy practice of our profession—a profession which is open to all men of education, intelligence, and industry, and one in which the greatest successes will attend those to whom further an artistic perception has been given, and in whom it has been carefully cultivated. In speaking of an architect as an artist I do not mean that he is to be a clever draughtsman merely—far from it. A man may be the most exquisite of draughtsmen, and yet be entirely deficient in the critical sense of what it is that makes a work of architecture beautiful. His works then will not be beautiful, and, so far as his architecture is concerned, he will not be an artist. While not neglecting to cultivate our powers of delineation, we might perhaps do more to make those powers of use to us than many of us do at present. If, for instance, instead of sketching ancient examples so much, we were content to do half as much in this way, and afterwards were to endeavour to reproduce our sketches and scale drawings from memory, we should accomplish two things—marvellously sharpen our observing powers, and greatly increase our facility in design. We should make the building we are studying our own; it would be in our heads and not merely in our sketch-books. Our memory drawings would be tinged with our own individuality and shortcomings, which it would be well to correct by after-reference to our original drawings, or, better still, to the building itself if accessible. And, further, if time could be spared to analyse the sources of our satisfaction in the object of our study, to take notes of its excellencies or defects of plan, construction, and detail, that time would not be lost, though we might have less to show to admiring friends, fewer trophies to hang on these walls as evidence of our industry and powers of draughtsmanship on our return from a tour, the result of victory in some Institute prize competition. I wish it were possible for the Institute to discover not merely what our prize-holders draw during their tours, but what they have learnt, what they have assimilated, what has become part of themselves. I believe the study of one excellent example—say a church—if thoroughly done, would do more to make an architect than rushing, sketch-book in hand, through half the cities of the world, even if years were spent in this sort of travel. I speak not as one who has lately attained to any sort of excellence in this way, though I begin to see clearly what I have lost by not practising it.

#### *Architecture in the Future.*

It is to our young architects that we look for triumphs in the future. We rejoice in the prosperity and vitality of the Architectural Association, and make its members again welcome to the use of this room for their Friday evening meetings. The desirability of establishing a kind of "common room," in which the young and old of our profession may meet and exchange ideas, was strongly urged by Mr. Appleton in his recent address. I can only repeat that in this, as in all other things, the Institute will help the Association as far as lies in its power. The annual prizes which the Institute has to bestow, through the munificence of its members, are largely competed for, as they should be, by members of the Association. There is certainly a most encouraging excellence in the draughtsmanship of many of the designs sent in, and I think also in design itself there is to be noted an advance on former years. When the prizes were distributed last, it was remarked how few of those we wished thus to honour were present to receive their rewards. This was to be regretted, as it is always a pleasure to those who meet here to see, and it may be make the acquaintance of, their younger brethren who have so distinguished themselves. At the Royal Academy, the prizes won are not given at all unless the victors present themselves on the occasion appointed for their distribution. On behalf of competitors for travelling studentships, I would express the hope that means may be devised to reduce the length of time during which it is compulsory for the student to travel if the sum awarded fall very far short of the expenses likely to be incurred. The Soane 50% studentship, for instance, involves a six months' tour. More may now be done in a shorter time than formerly, but at a proportionately greater outlay, and the inadequacy of the sum to cover the expenses of so long a period of travel no doubt prevents many, who would otherwise be inclined to contest the prize, from entering the lists.

Our reverence for the excellence of our forefathers' work,



and our delight in what has been superadded to that excellence by the finger of Time, making it yet more lovely, is a characteristic of our own day, and will induce us to deal tenderly with old work when it comes under our care. But there are now, unfortunately, not many buildings left upon which the architect and workman can exercise their forbearance and show their reverence for the "charm of mutilation and the fascination of decay." It may be proper to enlarge, add to, or even pull down old work for new, but surely never to endeavour to make old work look like new. The mischief which has been done in this way in England is immense, but nothing to what has been endured in France and Italy. Now a better state of feeling on the subject of restoration is gradually extending to the latter country. If they appear to agree with us in theory, however, they do not yet altogether in practice. When in Venice last spring I looked out in vain for an old friend, the Fondaco dei Turchi, by the Rialto. It had been rebuilt, and failed altogether to recall the impression of the old building which it is supposed to reproduce. Occasionally we may see our way to replace old work when research has made clear to us what it was originally, as Scott did at St. David's, and as Mr. Pearson is doing at Westminster Hall. Such cases must, however, be exceptional. It is certain that the past did not respect its own past as we do ours, and our practice, commendable as I think it, has no doubt its dangers. If we are for ever dwelling on the past we shall not be self-reliant; and if not self-reliant we shall never be bold originating architects. The Greeks spent their powers as artists in perfecting their own work, not in resuscitating a dead style; our Mediæval brethren theirs in the marvellous development of their own phase of architecture; the artists of the Renaissance, in spite of their name, were likewise originators. It has been left to us to copy, or, as M. Daly puts it, "to pillage ancient monuments"—not, like the church-builders of Byzantium and Venice, by boldly robbing other buildings to create fresh architectural marvels out of the material thus provided, but by reproducing old forms, with more or less ability, but also with more or less inappropriateness. Does it not behove us occasionally to consider this question seriously, and to ask ourselves to what good end this eternal copying and adaptation is to lead? We see that in America they are shaking themselves free from tradition. No doubt it is comparatively easy for them to do so; but are we to allow them to monopolise the guidance of common sense in architecture? May we not also make greater efforts than we have hitherto done to express the purpose of our works in a language of our own; to clothe our buildings, not in the cast-off garments of bygone ages, but in materials cut out and fashioned to suit ourselves and our own needs? We may love and reverence the past as archaeologists, but as architects let us not forget that archaeology is the bane of living progressive architecture, and that if our art is ever again to evoke popular enthusiasm, it must do so by embodying the thoughts, the aspirations, and the genius of the living people for whom we build.

I fear I have already tried your patience, so I will detain you no longer, but conclude these somewhat discursive remarks by expressing the hope that we may all, both in our private practice and as members of this body corporate, do our utmost to give our art a firmer hold on public admiration and attention, and our profession respected by all with whom we come in contact, so that every member of the Royal Institute of British Architects, whether his work be lovely or not, may at any rate show in his life the things that are honest and of good report.

Mr. EWAN CHRISTIAN observed that he was sorry the task, or he should say, the pleasure, had not fallen to abler hands, but he rose to ask their hearty thanks for the President for the interesting and practical address with which he had favoured them. The President had traversed a wide field, and he did not intend to follow him through the whole of his wanderings. The President had congratulated them on the completion of a work commenced under his (Mr. Christian's) presidency, namely, the revision of their Charter and the passing of the by-laws which accompanied it. In a short time he hoped the work would be consummated. That was a matter to rejoice over, for it had been a source of trouble and anxiety to complete it properly. He and most of them must agree with the President that they wanted education and not registration, and that candidates should so prepare that they might pass the examinations creditably and without cramming. They wanted highly educated men as members of their body, and they would have many of those as time went on. The President had spoken strongly, and rightly so, on the matter of laying out our cities. He had very properly commented on the destruction of Nash's lines in the laying out of Regent Street. Nash might not have been in the front rank as an architect, but he certainly had a genius for laying out cities. The lines of Regent's Park and Regent Street were such as should be recognised in these days as most able works. The Quadrant had been tampered with in the first place, but in destroying

the Circus a great evil had been done. Surely, he said, something might have been done to prevent the destruction of the excellent arrangement laid out by Nash. That, he feared, was hopelessly lost and not now to be remedied. On the subject of what had been achieved in Continental cities, Mr. Christian remarked that we had not space here to do things on such magnificent lines. What they could do they would, to prevent light and air being shut out of their streets. He could not but rejoice that the scheme for the War and Admiralty Offices was knocked on the head, for now, as long as he lived, he would see the sky over the top of Whitehall. The Law Courts had been referred to in the address. That building had been most cruelly treated. Mr. Street's fine design had been absolutely ruined because the authorities would not give him a few more feet of ground—ground now utterly wasted, and being laid down in grass. It would have made a totally different building of it, and would have given space for the corridors; and they it would have a magnificent building for all time. There had been absurd remarks made in some of the public papers of late, but architects knew how shamefully Mr. Street had been cramped. Had there at that time been proper care exercised in the laying out of public places and buildings, things would have been different. In regard of country buildings, few persons, Mr. Christian said, knew what an immense work had been done in the construction of private residences that were dotted about the country. Almost everywhere new buildings had arisen, so that the Victorian era had been more prolific in the erection of interesting buildings than even the Elizabethan age. He thoroughly agreed with the President how important it was that an architect should be capable of designing not only the material building, but also be able to fit it into the surroundings with perfect beauty. Those who had visited Castle Howard, in Yorkshire, would have seen that the architect was a consummate artist, as well as architect, in stone and mortar. Nothing more excellent in the laying out of the place and the surroundings could, he considered, be seen anywhere. For one who had the opportunity of building a country house there was nothing more delightful than thinking out the scheme of the surroundings and beautiful gardens. Unless they could thus see it all from the commencement the work was likely to be a failure. The biography of Mr. Street was a book that should be in the hands of every student. It was hoped that there would soon be another edition, which would combine with the letterpress a few examples of the wonderful sketches made by Mr. Street. Along with Mr. Pearson he had travelled in Savoy with Mr. Street just two months before his death. Arriving at the Lac de Bourget, Mr. Street had immediately seized on a fine doorway on the south side of the church, and in a short time had made complete drawings in his sketch-book, with every detail that was necessary for a workman to carry it out. Mr. Christian next spoke of American architecture. The influences at work there were different to those here. American architects were hampered by the unfortunate circumstance, as he thought, that there was nothing firm in the way of administration. Every four years there was an upset; architects were changed as well as other individuals, and architecture showed signs of the deleterious effects of that system. He was amazed when he saw the wonderful tower of Trinity Church at Boston. They never got to such dimensions in England as were illustrated in that tower. It was one of the most beautiful examples of a tower that he had ever seen. America was in an interesting condition as to art. It was a giant at work, but it hardly knew how to use its tools. The result would be some day a grand one indeed. The death of the great architect Richardson was to his mind a national misfortune to America. It took a long time to produce an artist like that man. They could not expect to see another Richardson, though they might see many of his pupils. Mr. Christian concluded by saying he fully shared in the President's horror at the terrible profanation of that interesting building the Fondaco dei Turchi, all that had been beautiful about it having been destroyed.

Mr. FLOCKTON said he had been both honoured and surprised by the request to second the proposal to return thanks to their President. His notions of modesty would not permit him to make a speech were he able at so short a notice. Time and ability had been devoted to the address to which they had listened. That time and trouble were required he was able to affirm, having in a very humble way had to prepare a presidential address himself; also anxiety that one might say everything one should say, and say nothing one would wish not to have said; and also anxiety to interest the audience rather than send them to sleep. The President had fulfilled all those conditions most thoroughly.

The vote of thanks was carried by acclamation.

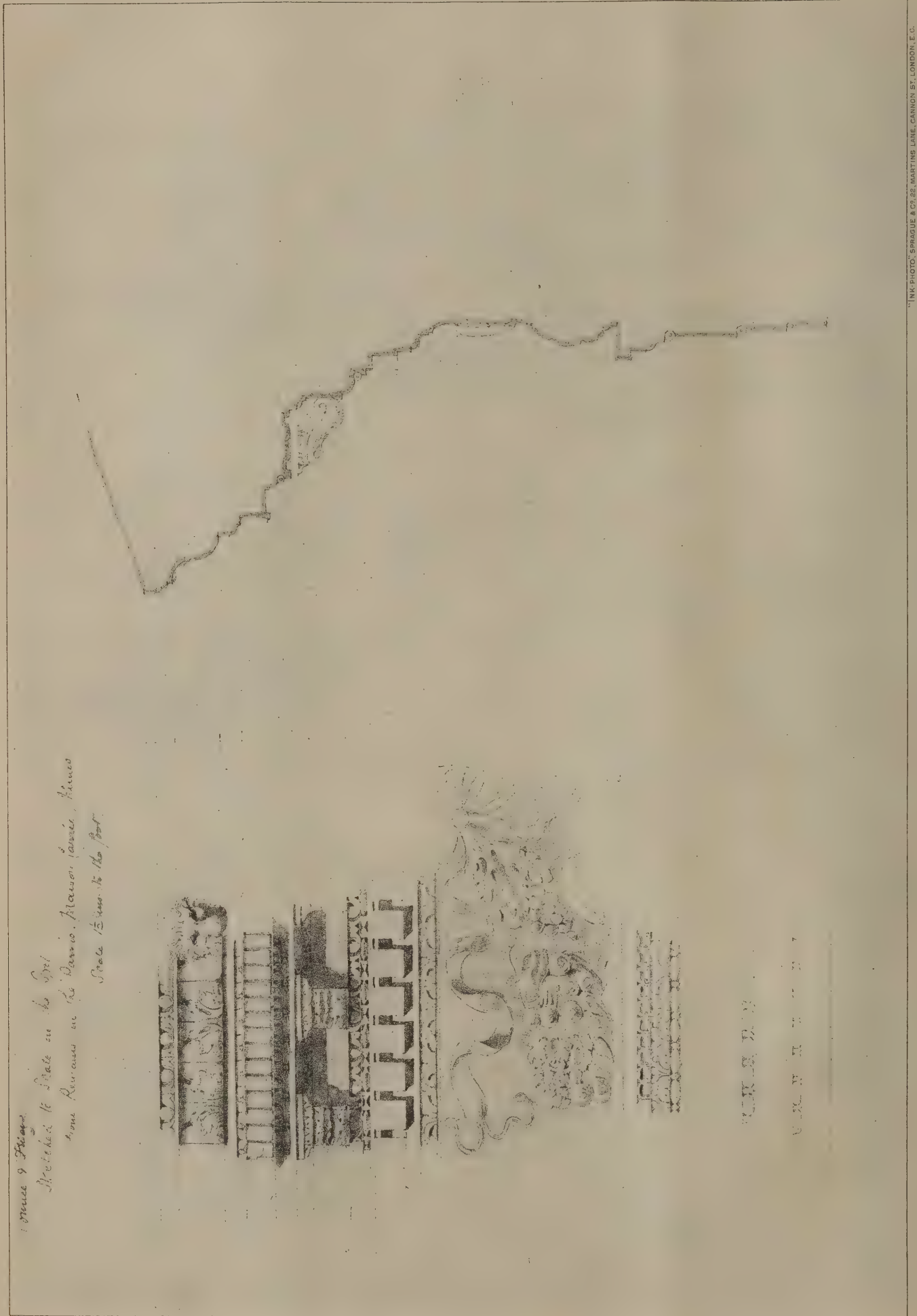
The PRESIDENT in replying said he had been particularly gratified in hearing from Mr. Christian's lips how he supplemented his remarks on the Law Courts and their late lamented president, Mr. Street.

The meeting then adjourned.









SKETCHES FROM NÎMES.

By A. NEEDHAM WILSON







Ölm. Architect. Nov. 9<sup>th</sup> 1888.













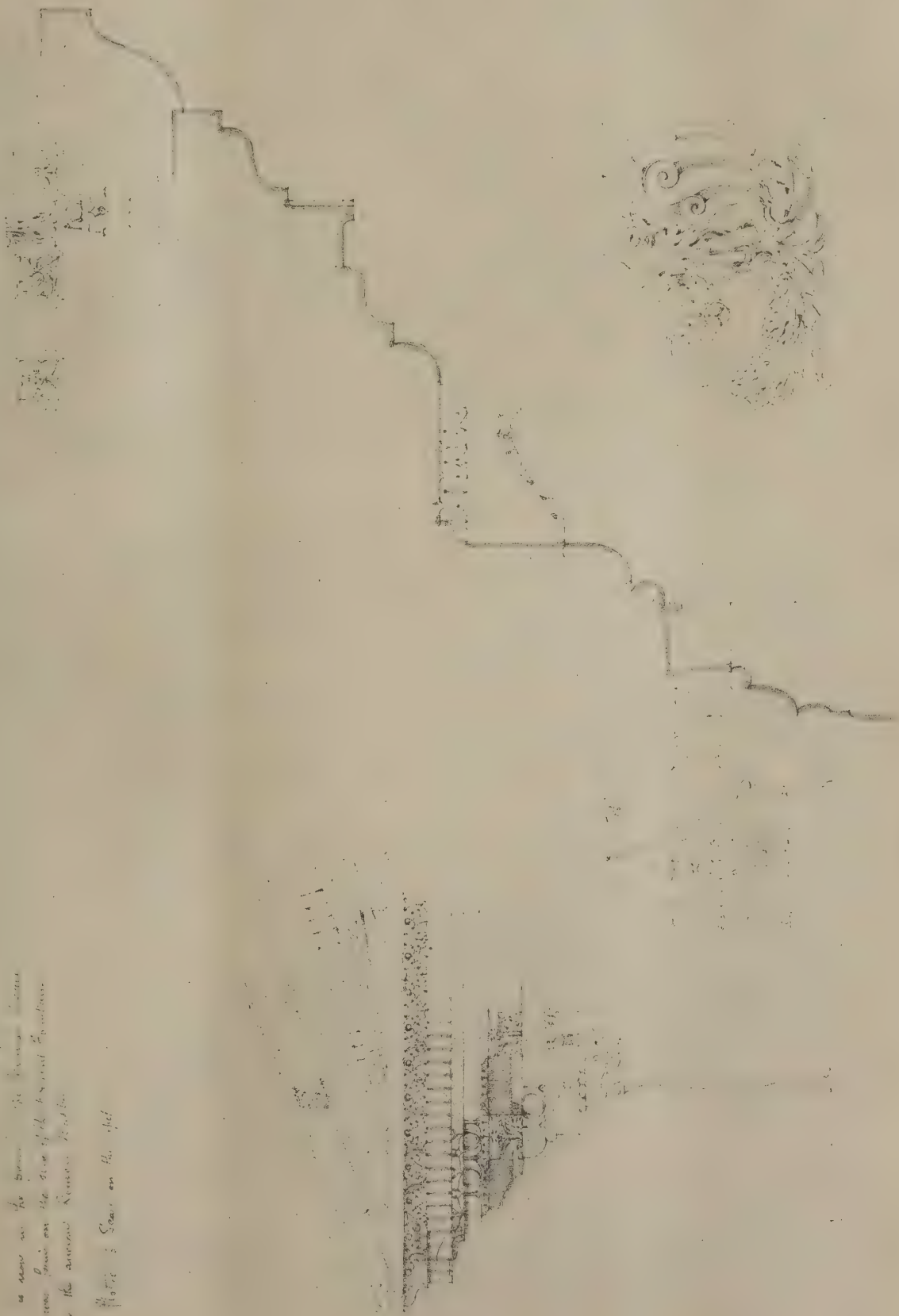
Remains of Remains of Remains

Rome

1/2 to 1/4 ft.

This is now in the ground. The remains of the  
of some kind on the site of the ancient Remains.  
near the ancient Remains. Remains.

Notes: See on the spot.



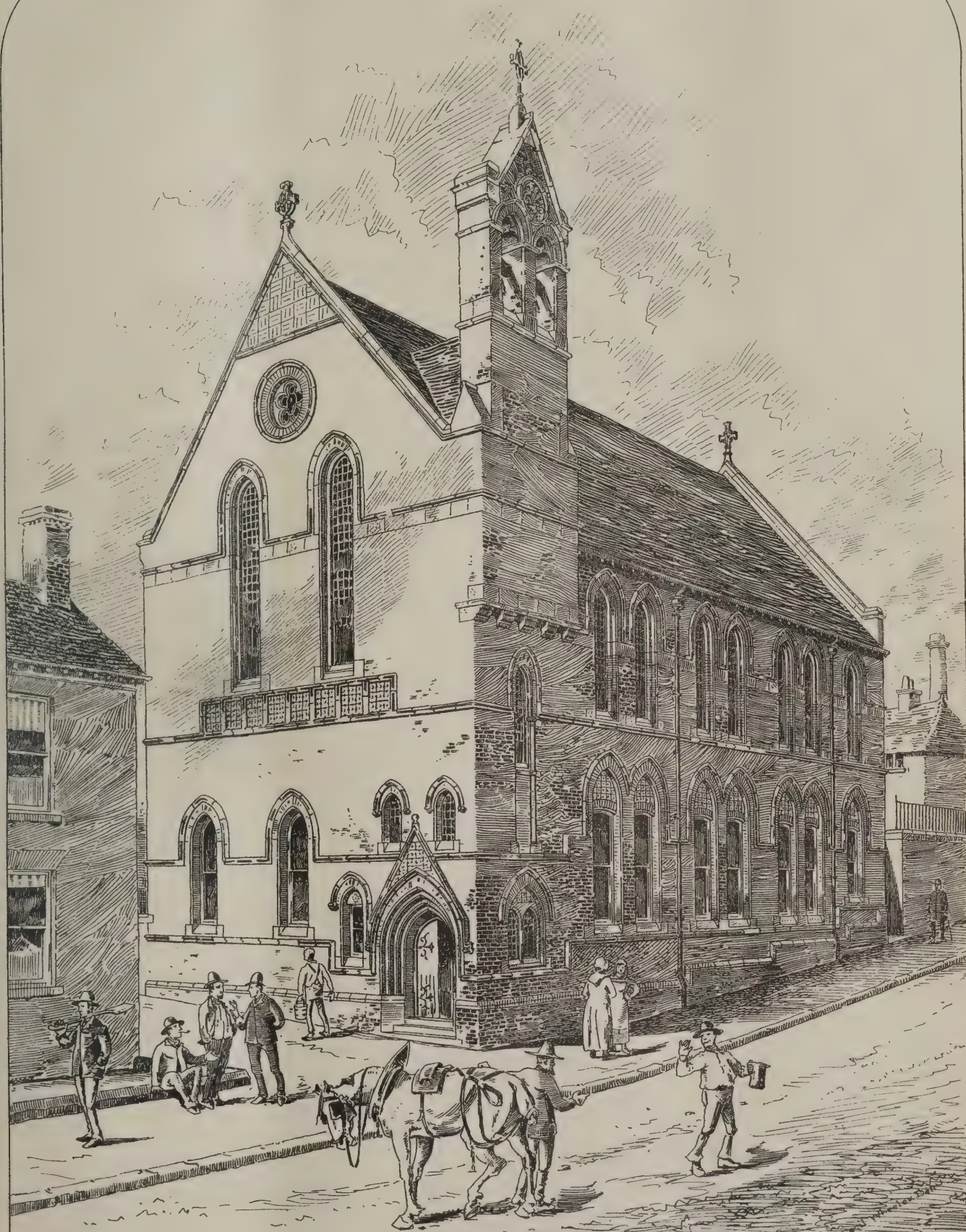
SKETCHES FROM NÎMES.

By A. NEEDHAM WILSON









Parish Church Mission Room. Leeds. Chorley & Connon Arch<sup>ts</sup>  
15 Park Row, Leeds.







## NOTES AND COMMENTS.

THE exhibition of the works sent to Paris by the students in residence in the Villa Medici, Rome, was opened lately in the Ecole des Beaux-Arts. The most remarkable of the architectural works is M. REDON'S restoration of the ruins of Baalbec. Among the paintings may be noted a decorative composition by M. BASCHET, M. LEBAYLE'S *Lazarus at the Door of Dives*, and M. PINTAS *Tobias*. In sculpture, M. GARDET'S *Archer*, the *Cupid and Psyche* of M. CAPALLERO, and the *Holophernus* of M. LOMBARD attracted attention.

FEW visitors who enter the church of the Sorbonne, in Paris, could believe that at one time it contained statues of the twelve apostles. They were transported to his military school of Saint Cyr by NAPOLEON I., and placed in the chapel of that institution. The Sorbonne is now about to enter on a new lease of life, and, although the church may not be much utilised, there is a desire to bring it more near its original condition. Application was made to the Minister of War and he agreed to return the statues. The tomb of RICHELIEU (it was deprived of the remains of the Cardinal during the Revolution) will once more have the companions which were removed eighty years ago.

NICHES were formed in the new Luxembourg Gallery for the reception of busts of artists. The authorities have selected the subjects. They are as follows:—HOUDON (1741-1828), the sculptor; DAVID (1748-1825), the painter of Greek and Roman scenes; Baron GROS (1771-1835), painter of Napoleonic and Royalist scenes; RUDE (1784-1856), the sculptor of the vigorous *Departure of the Volunteers*, or *La Marseillaise*, on the Arc d'Etoile; PRUDHON (1760-1823), painter of religious and idyllic subjects, and draughtsman; DAVID D'ANGERS (1789-1856), sculptor and Republican enthusiast; INGRES (1781-1867), champion of the "Classicists" in painting; PRADIER (1792-1852), sculptor of *Sappho*, *Phryne*, *Venus disarming Cupid*, &c.; DELACROIX (1799-1863), champion of the Romanticists in painting; BARYE, sculptor of animals, one of the great artists of the age, who was compelled to model paper-weights and insignificant works; THEODORE ROUSSEAU, the landscapist, who was called "le premier apôtre de la vérité dans le paysage"; and MILLET, who transformed the sordidness of French agricultural life into beauty. According to the Administration of the Beaux-Arts as now constituted, the foregoing men are to be considered the representative artists of France during the century.

THE difficulties which attended the project for the utilisation of the Castle of Norwich as a museum seem to be an end. At present there is a capital museum in the city, but there is little in it, except stuffed birds and geological specimens. An objection was wisely raised that it would be vandalism if the walls were covered with glass cases. It is now proposed that the birds shall be placed in an exterior corridor, and the ground floor of the keep be occupied with archæological objects, fossils, &c. The alteration of the castle—including a roof over it—will cost 10,756*l.*, of which four-fifths are collected. The items of Mr. BOARDMAN'S estimate are as follows:—Keep, 3,711*l.*; Bigod's Tower, 100*l.*; committee-room, with additional width of corridor attaching, 800*l.*; adapting three blocks and connecting them, 2,415*l.*; heating, gas, and drainage, 800*l.*; incidental expenses, including lavatories, &c., 530*l.*; new wall-cases, 1,880*l.*; architect's commission, 515*l.*; total, 10,756*l.* A joint committee will be appointed for the new museum, representing the Corporation, the existing museum, and Lord WALSINGHAM'S Committee.

It is supposed that HANDI-BEY, the director of the Ottoman Museum at Constantinople, who is now journeying in the East, will stop at Smyrna in order to superintend

the excavations which are to be undertaken in the search for the *Apollo* of PRAXITELES. A peasant has, it appears, discovered the head and arms, which are in the noblest style of art. They were not broken off the figure, as the head and arms were joined to the trunk in an ingenious manner.

AMONG the works which established the reputation of HANS HOLBEIN the Younger was a series of frescoes illustrative of the history of the HERSTENSTEINS, which he painted on the walls of the mansion of the family in Lucerne. They were commissioned by JACOB DE HERSTENSTEIN, a patrician of the city, and who was a friend to the painter. In 1826 the old house was restored, and in the course of the transformation HOLBEIN'S frescoes were cleared away. Fortunately the principal scenes were copied with exactitude by SCHWEGLER, and they are now about to be reproduced by a publisher of Lucerne. The plates will be accompanied by a history of the HERSTENSTEIN family by M. DE LIEBENAU, the historian.

IT would appear from a report by M. LAMOUREUX that Paris contains too many houses for the population, a circumstance which is evident to any one who perambulates the new quarters of the city. Between 1876 and 1881 the population was increased by about 300,000, and speculators were warranted in believing that it was safe to provide for a continuous growth in a similar proportion. But in the five years which followed—1881 to 1886—the increase was only one-fourth, or 75,000. What was the consequence? In 1885 there were 17,000 logements or tenants' dwellings unoccupied, representing an annual value of 4,962,000 francs; and this year the vacant dwellings are returned as 28,837, of which the value is 7,335,000 francs. It is believed that the unoccupied dwellings are mainly those which were intended for people who could not pay high rents, but who now prefer to live in one of the suburban districts. The growth of places like Asnières, which are inhabited by men and women who work every day in Paris, is a sign of the change in French manners which a few years ago would have seemed to be an impossibility.

THE authorities of the Paris Exhibition have sanctioned a credit of 250,000 francs for forming luminous fountains like those which were introduced at South Kensington. The French people are fond of fireworks, and as the English fountains will give plenty of colour and light, they are intended to serve instead of pyrotechnic displays. Another element of the picturesque will be found in the Turkish, Moorish, Indian, Roumanian, and Javanian cafés, the Franco-Annamite restaurant, the Dutch bakery, the Swedish beer-house, and the English dairy, which are also to find a place within the boundaries of the Exhibition. The Chambers of Commerce and the Maritime Ports are to have a pavilion, which is to cost 2,000*l.* The city of Paris has shown the right spirit in allowing the demolition of the two pavilions which were erected in order to display evidence of the works undertaken by the municipality. They were supposed to interfere with the general effect, and the sites will be converted into gardens.

MR. L. H. LEFÈVRE has just brought out a fine original etching of the Tower of London by Mr. LAURENCE B. PHILLIPS. The subject is one of the most picturesque and interesting in London, and Mr. PHILLIPS has represented it from a point of view which allows full expression of the building and its surroundings. The etching is effective in treatment, and it is evident that the artist is able to appreciate and to render what remains of ancient architecture in London. It is to be desired that he may be allowed many opportunities for producing similar works. The publication of the etching by Mr. LEFÈVRE is a guarantee of its quality.



## ILLUSTRATIONS.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NOS. 37, 38, 39.—SKETCHES FROM NISMES. [A. NEEDHAM WILSON.]

MISSION-ROOM, LEEDS.

SCHOOLS OF ST. ANNE, HAUGHTON, NEAR MANCHESTER.

THE above schools, which we illustrate in the present issue of this journal, have been erected and furnished throughout at the sole expense of Mr. J. W. SIDEBOTHAM, M.P., and Mr. E. J. SIDEBOTHAM, M.A. The schools are another step towards the completion of a scheme which the late Mr. JOSEPH SIDEBOTHAM, of Bowdon, had intended carrying out for the benefit of this district. Accommodation is provided for 500 scholars. The buildings are erected of grey bricks with red dressings; the roofs are covered with Ruabon tiles. Ornamental terra-cotta panels have been introduced on the three principal elevations. In the centre of front elevation is a specially designed mosaic panel, representing St. ANNE teaching the VIRGIN MARY. The turrets and dormers are of oak, relieved by filling-in of KEEN'S cement. The windows have varied designs of lead lights in the upper portions. Master's and mistress's rooms are provided over the children's lavatories. The whole of the buildings are heated by hot water, in addition to having open fire-grates. The three essentials, efficient heating, lighting, and ventilation, have all been obtained in the most approved manner. The furniture and fittings in the various rooms are of the best description obtainable, and are in keeping with the educational requirements of the present day. The work has been carried out very satisfactorily by Mr. JOSEPH CLAYTON, builder, of Denton, from the designs and under the superintendence of Messrs. STONES, GRADWELL & GRIMSHAW, architects, Commercial Chambers, Church Street, Accrington.

## THE ARCHITECTURAL ASSOCIATION.

THE second ordinary meeting of the Association was held on Friday evening, Mr. H. D. Appleton, F.R.I.B.A., president, in the chair.

The following gentlemen were elected members:—Messrs. J. A. Waddington, E. O. Warne, S. P. Davis, J. B. Tansley, E. C. Finch, W. L. T. Brown, A. J. Hardwick, A. Spiers, A. J. Roddis, F. Rhoades, W. Langbein, A. Cox, C. Roche, A. G. Salmon, A. E. Watson, H. P. Adams, A. P. Crabb, R. N. Sinclair, T. H. Bishop, S. Howard, G. P. Armstrong, M. Price, A. Hogwood, E. R. Cook, P. S. Worthington, G. E. S. Stratfield, H. E. Kirby, J. C. Watt, W. W. S. Smith, J. Hunt, J. H. Richardson, H. L. Goddard, H. F. Mence, G. Kenyon, D. B. Niven, A. H. Crawford, A. Wollheim, J. H. S. Fane, A. A. Abrahams, E. C. Frere, J. A. Pywell, F. E. Williams, F. J. Potter, J. Murray, J. Steuart, J. R. Stark, F. Cook, J. W. Wyles, A. Whitcombe, E. A. Whipham, W. C. Ashworth, H. E. Elkins, W. E. Holland, G. G. Lynes, J. W. Hall, G. P. Pratt, R. W. Gibbon, H. Story, F. J. Slater, C. G. D. Innes, E. J. Wallis, H. G. Leslie, H. C. Mann, C. Evans, W. A. Hughes, and W. Palotta.

Mr. T. E. PRYCE, hon. secretary, stated that any members so desirous could attend the lectures given in connection with the Arts and Crafts Exhibition on the lower scale of fees. They should send in their names to the hon. secretaries as early as possible.

The PRESIDENT said the first meeting of the Elementary Class of Design would be held on Friday, the 9th inst. Mr. Gardner intended to give limelight illustrations of Early English architecture of the thirteenth century in connection with Mr. Mitchell's lectures. Independently of members of the class, any member of the Association could attend that night.

Mr. J. A. GOTCH, F.R.I.B.A., then read a paper entitled "Elizabeth and Victoria."

A discussion followed the reading of the paper, in which Messrs. Kershaw, Shuffrey, and Brodie took part. On the motion of Mr. Hooper, seconded by Mr. Cresswell, a vote of thanks was passed to Mr. Gotch, and the meeting separated.

A report of the paper and discussion is postponed till next week.

## THE INSTITUTE BY-LAWS.

AT the meeting of the Institute of Architects on Monday night, Mr. MacVicar Anderson, honorary secretary, said it would be recollected that at the special meeting held last May, it was decided that the new by-laws should be submitted to the Lords of the Privy Council with as little delay as possible. Mr. Markby, honorary solicitor to the Institute, had forwarded the draft. A reply was received, dated June 30, acknowledging the receipt of Mr. Markby's letter of May 27, stating with respect to the proposed by-laws, their lordships were advised that two points in the by-laws were defective:—1st. That no provision was made for the examination of Associates in accordance with clause 4 of the Charter of 1887, nor was the passing of such examination required by any of the by-laws then put before the Privy Council.

2nd. That by clause 65 of the by-laws, the conditions of competition for prizes, &c., was left to be defined by the Council of the Royal Institute, whereas clause 34 of the Charter of 1887, subsections (a) and (g), clearly required those matters to be dealt with in the by-laws, and the Lord President was advised that the by-laws ought not to be approved until supplemented by others to supply the deficiencies.

In acknowledging the above, Mr. Markby, in a letter dated July 6, pointed out, on the part of the Council of the Institute, that sections 3 and 4 of the Charter provided that persons desirous of being admitted as Associates and Fellows as from the date of the Charter should, after the expiration of five years from the date of the Charter, pass certain examinations, and that it had not been thought necessary to do more than provide for the appointment of examiners. In deference to the views expressed by the Privy Council, clause 2 of the by-laws had been amended by a condition that a candidate should declare that he had passed the examination required under the Charter, and an addition had been made to clause 41, binding the Council annually to appoint a Board of Examiners in Architecture to conduct the examinations for candidates for admission. With reference to clause 65, it was impossible to describe in detail the precise terms of any competition which naturally varied from year to year, and a new clause had been substituted. This, with the programmes issued from time to time, it was trusted would be a sufficient compliance with clause 34, subsection (g), of the Charter.

A reply to this was dated August 16, stating that the amended draft by-laws did not sufficiently meet the objections. As to the admission of Associates, the by-laws should define—at any rate, by general description—the character of the examination which Associates have to pass, and as to the terms and conditions for prizes, &c., the by-laws should embody such of them as do not necessarily usually vary from year to year.

Mr. Anderson then stated that a draft of amended by-laws had been prepared. It was in the hands of Mr. Markby, and would be submitted to the Lords of the Privy Council, and they hoped would soon be passed.

EDINBURGH ARCHITECTURAL  
ASSOCIATION.

AT the first meeting for the session of this Association, the president, Professor G. Baldwin Brown, delivered the opening address, taking as his subject "Some Aspects of the Work of an Architectural Association." After referring to the constitution of the Association, he asked what it could do for the benefit of the various classes of members composing it? The architectural hall should, he said, be made, first, a pledge of the solidarity of the architectural profession; secondly, a place of instruction, and still better of stimulus, for the younger members; thirdly, a centre of artistic influence that might affect the public at large. The architect, often to his sorrow, had to deal not only with artistic matters, but with complicated matters of business; he had to avoid the danger of sinking the artist in the man of affairs. The Muses, if the nineteenth century had not driven them away, should be appointed doorkeepers of the architectural hall, and should suffer no business cares, no sense of professional rivalry to follow those who entered to share in the work of the Association. On the important questions of more formal union among Scottish architects, on architectural federation, and the like, it became a layman to speak with reserve, but it was not satisfactory that there should be no body constituted for Scotland in general to represent architecture in questions such as those of professional practice, which might from time to time arise. He desired to speak with all loyalty of the Institute in London—an Institute, it must be remembered, of British architects—and a good solution might be found through some process of affiliation. In any case, they should strive for more solidarity among the



members of the profession in Scotland. In the country generally there seemed too many local jealousies, too little united effort. What was the use of a lively national sentiment if it did not result in hearty common action for the general good? The Association this year was doing something towards this end by interchange of papers with other Scottish societies, meetings in common, and the like. With regard to the educational work of the Association, there were the work-classes, which had been carried on since 1883. It was proposed now to endeavour to systematise the classes so as to make them a fit preparation for the examination of the R.I.B.A. The great difficulty was the want of any endowment. There was a good work being done that might be greatly extended if a little help was afforded. Edinburgh was famous as an educational centre, but it would be a great advantage if some benevolent despot could lay hands on all the educational apparatus of the city, and redistribute the endowments and the work so as to avoid the overlapping and rivalry which were now so prevalent. Then, again, more united effort, less jealousy and narrowness were needed. But the younger members of the Association might usefully start some educational work of their own. Why should not a club or society for design and decoration be formed? It would need a name and a sort of patron saint, as St. Luke was patron saint of the artistic guilds of the Middle Ages. What name could be better than that of Robert Adam, who was as great in ornamental design as in monumental architecture. After sketching the possible work of such a society, the President concluded by reminding the younger members that though they were practical students and not dilettanti, they must remember that the dilettante had something to teach them. He dealt with art because he took a pleasure in so doing, and all artistic work should be done in the spirit of enjoyment.

#### SHEFFIELD SOCIETY OF ARCHITECTS.

THE opening meeting of the Sheffield Society of Architects and Surveyors was held on Tuesday in last week, when Mr. Flockton, the president, delivered an address.

He stated that the full attendance of members at the opening of the second session of the Society showed no falling off in zeal and energy, and augured well for the future. The first session had been a success, the sound policy of "walking before running" had answered in this as in other undertakings, and good work had been done towards the objects specified in their rules—professional advancement and the promotion of professional culture. Valuable papers by Mr. J. W. Connon, of Leeds, on "The Legal Registration of Architects," and by Mr. J. Murgatroyd, of Manchester, on "Association and Federation," had been read and carefully discussed; and the action taken by the Society *re* the Bill introduced in Parliament for the legal Registration of Architects had a direct and important bearing on it. There had been a difference of opinion amongst them on the merits and details of the Bill and the mode of its promotion; but it was unanimously resolved, after final consideration, that legal registration of the profession was desirable. The acceptance of the invitation of the R.I.B.A., for the alliance of their Society with the Institute, was matter for congratulation, showing the desire of the Institute to establish a broader basis for a cordial, intimate, and practicable union with provincial societies than had hitherto existed. In his own case the modified form of declaration had removed all difficulty, and he had at once applied for and had the honour of election as a Fellow confirmed.

The courteous action of the Improvement Committee of the Town Council of Sheffield, in affording their Society an opportunity of carefully discussing the proposed new by-laws for new streets and buildings in the borough of Sheffield, and the manner in which their suggestion, given after much attention had been devoted to the matter, had been received, and especially the request that the Society should communicate with the Local Government Board, were proofs that the Society was making its influence felt.

He had been asked to accompany the chairman of the Sheffield Highway Committee, with the town clerk and their member, Mr. W. C. Fenton, to the office of the Local Government Board in London to further discuss the by-laws. Finally, the draft by-laws had been referred back to the committee for further revision; and this had since been done, the alterations referring especially to open spaces to be left in front and rear of new property in central town sites.

In the advancement of professional education, especially amongst the junior members, valuable papers had been contributed by Mr. C. Hadfield, on "The Position and Attainments of the English Architect"; by Professor T. Roger Smith, on "Architectural Education"; and by Mr. J. D. Sedding, on "English Architecture." In the coming session papers on technical subjects would be read:—In November, on "A Proposed Improvement in Theatre Planning," by Mr. E. J. Tarver;

in December, by Mr. H. W. Brewer, on "Some of the Smaller Municipal Buildings of Germany"; in January, by Mr. J. McNery, on "Estimating"; in March, by Mr. W. Emden, on "Theatres"; and probably by Mr. H. Stannus and others. On the whole the prospects of their Society were cheering; and if they all pulled together, and did not allow interest and exertion to relax, there was no doubt of its capacity for doing useful work, and of the prospect of its becoming a permanent and very beneficial institution; and he was sure he should not appeal to them in vain to keep up interest in the work they had so well begun.

He proceeded to review the state of architectural practice in Sheffield half a century ago—about the time of his entering the profession. In those days work had to be carried on with few of the aids now available. The Royal Institute of British Architects had held its first meeting the previous year. There were no professional journals with their valuable illustrations and information, no photography; lithography was in its infancy. Facilities for study were limited, and travelling far in search of existing buildings difficult and costly. Nowadays all this was changed. But young men must remember that the men who preceded them were determined to acquire knowledge in spite of every difficulty; and if they wished to succeed nowadays they must avail themselves of every opportunity of acquiring and storing information, and make themselves competent architects ready to seize on their opportunity as it occurred. Their honorary secretary himself had got together a few drawings of architectural work in Sheffield, from about the years 1831 to 1847, which hung on the walls. They included drawings by his father, the late Wm. Flockton, the late M. E. Hadfield, and the late J. G. Weightman, and also some of his own work. Speaking of the changes in architectural fashion, he observed that the so-called fashionable Queen Anne style, which had sprung up of late years, however beautiful and picturesque where properly treated, was in indifferent hands likely to degenerate into trumpery and commonplace work.

On the motion of the vice-president, Mr. F. Fowler, a hearty vote of thanks was awarded to the President for his address.

#### THE RHIND LECTURES.

THE subject of the concluding lecture of the present course of Rhind lectures was "The Culture and Civilisation of the Early Lake-dwellers of Europe," and Dr. Munro summed up the conclusions to be derived from the preceding lectures of the course. The relics found in the lake-dwellings furnished the materials for reconstructing the history of the people who inhabited them, and Dr. Munro went on to show in this way that the earliest lake-dwellers of the Stone Age knew the arts of spinning and weaving, cultivated the cereals, had stocks of domestic cattle, paid not a little attention to ornament, and, in fact, were in possession of all the elements of a high state of civilisation. He showed how the Stone Age, after a period of transition, passed into the Bronze Age, which was characterised by a higher degree of refinement and greater knowledge of the arts of civilisation, and he discussed from the osteological remains of the lake-dwellers the probability of the Bronze Age having been brought about by the advent of a new race of settlers. Then he discussed the characteristics of the Iron Age, and from its sudden appearance in Switzerland, and the perfection to which the manufacture of iron appeared to have all at once attained, he showed how it indicated a new race of people, who had conquered the old lake-dwellers and brought about the downfall of their civilisation. He discussed the question who these new comers were, coming to the conclusion that they were a branch of the original Celts of Europe; and, finally, he dealt with the original settlement of the lake-dwellers in Europe, indicating from the distribution of remains the direction in which they had spread themselves over the face of the Continent. At the close, on the motion of Dr. Anderson, Dr. Munro was heartily thanked for his lectures.

#### THE LINE OF FRONTAGE.

ON Friday, in the Queen's Bench Division, an appeal was heard against an order of the magistrate at Wandsworth directing the demolition of a house, No. 149 Sugden Road, Clapham Common, under section 75 of the Metropolitan Management Act, 25 and 26 Vic., cap. 102, enacting that no building should, without the written consent of the Metropolitan Board of Works, be erected beyond the general line of building in the "street, place, or row" of houses; and that any building erected without such consent might be demolished. Sugden Street and Marney Street had been recently laid out on a newly-formed building estate, parallel to each other, and at right angles to Clapham Road. The superintending architect



certified, on February 13, 1888, as to what was the general line of building in Clapham Road, at which date the house now under discussion was not as yet erected. As now erected it was in line with the rest of the row in Sugden Street and faced that street, and had no means of access except from that street, but projected beyond the line in Clapham Road. The general line of building, as certified, in Clapham Road was at a greater distance than 50 feet from that road; the house in question was less than 50 feet from that road. On April 13, after hearing the complaint of the Board of Works, the magistrate ordered the house to be demolished, as being a building in the "street, place, or row" of houses in the road, and projecting beyond the general line of building in the road, and within 50 feet of the highway. Counsel relied in support of his contention upon the case of *Barlow and Another v. The Vestry of Kensington* (11, App. Cases H.L., 257). In that case the appellant (against an order directing the demolition by the vestry of his house) lived in a house at the corner of the Kensington Road and a new street, called De Vere Gardens. The site of the house, abutting on the eastern side of De Vere Gardens, projected beyond a row of houses on that side of the gardens. The superintending architect to the Metropolitan Board of Works certified that the main front of that row of houses in De Vere Gardens was the general line of building in the gardens, but did not decide that that was the general line of buildings either of the row or street in which appellant's house was situate. The House of Lords, reversing the decision of the Court of Appeal, held that no offence under section 75 had been committed, and that there was no jurisdiction for the magistrate's order directing the demolition.

Lord Coleridge said:—If appellant's contention was correct, immediate legislation would indeed be at once necessary. Here the architect had certified to the building line; this building had been found to be within the building line so ascertained. It was not denied that this building was one which, if it faced Clapham Road, would be in Clapham Road; but it was urged that it was, facing as it did to Sugden Road, not in Clapham Road but in Sugden Road; and therefore that the building was not an encroachment such as could be ordered to be removed. So to hold would practically nullify and render nugatory all the provisions of legislation upon the matter. It was found as a fact here that the building was within the building line and also that it was situate in Clapham Road; hence it was within the prohibition of section 75. On an expression in section 13 it was sought to found an argument, which was too subtle, that there was a difference between a finding that "the site of a building" was in such and such a street and a finding that a "building" was in such and such a street. This decision in no way clashed with the recent decision of the House of Lords in the *Kensington case*, "*Barlow v. The Vestry of Kensington*," by which, even if they were disposed to differ, this Court was bound, and with which he entirely and respectfully concurred. It seemed to be a decision not only sensible but obviously sound. There it was held, as might have been expected, that the house alleged to encroach on the line of De Vere Gardens was not in De Vere Gardens, nor subject to observe the general line of buildings in De Vere Gardens; and, in consequence, that no offence had been committed under section 75 by the building of the house, and that there was therefore no jurisdiction for a magistrate's order under that section directing the demolition of the projecting part. The present case differed widely from that. The architect's certificate was here distinct and final, as laid down in "*Spackman v. Plumstead Board of Works*" (10, App. Cases, 229), and the magistrate's order, based upon that certificate, unquestionably right. The appeal must therefore be dismissed with costs.

### THE STUDY OF ART.

THE third annual exhibition of the Southampton Art Society was opened last week.

Mr. G. D. Leslie, R.A., who was present, delivered an address, in the course of which he said:—I know full well of my own shortcomings and failures—how almost entirely they have been owing to my dislike of hard work, and this it is that emboldens me to advocate to you to-night the extreme importance of hard work, but I do not wish to be misunderstood about the sort of work that should be hard. Even as a pleasant by-occupation art should not be trifled with, as the humblest endeavours of the mere beginner, if rightly and conscientiously directed, always command our respect and possess a certain amount of interest and value. Sir Joshua Reynolds in his first discourse said, "If you have great talents industry will improve them; if you have but moderate abilities industry will supply their deficiency;" and Sir David Wilkie modestly took this to heart when young, saying he knew he had no genius, and so he determined to be as industrious as he possibly could,

the result being that he became one of the most celebrated artists of his day. But I do not altogether agree with Sir Joshua in his remark, and I feel sure that it was not mere industry that made Wilkie what he was. There is no greater nuisance than an industrious fool, and the mischief he does is exactly in proportion to the amount of his industry. In art the worst artists are often the most industrious, and that is why we are so overwhelmed nowadays with bad pictures. There is another story related of Sir David Wilkie, which gives the real clue of his greatness. His mother said that when he was quite a youth she frequently overheard him, whilst at work, saying to himself, "Paint it weel, Davy"—conscientiousness, the endeavour to do as well and as truly as you can. This is what, no doubt, Sir Joshua intended would supply the place of genius. There should be the feeling that you cannot allow work to leave you with bad drawing, faulty perspective, difficult bits slurred over, false exaggerations or untrue tone or colour. You may have painted a carpet in your picture very carefully and industriously, taking possibly a week to do it, but after it is all done, if you find out for yourself, or someone else points out to you, what so frequently happens, that it looks sloping down to the spectator and not lying flat, and if, feeling this to be true, you, to save yourself the trouble of rubbing it out and repainting it, allow the picture to go from you as it is, trusting that people will admire the patient way you have rendered the pattern, &c., and never notice the bad perspective, then I say you are no true workman, and can only rank yourself amongst the noble army of industrious fools. A great deal of the badness of modern art results from ignorance, but this sort of badness is not half so bad as that of the impudent and unscrupulous artist who habitually violates his conscience, who makes daubs and blotches do duty for detail, puts senseless fussiness to represent intricacy, exaggeration of effect to supply the place of true force, and weak sickliness for delicacy; or, on the other hand, fills his subject with elaborate and painstaking niggles in proportion and drawing. It is this sort of thing which makes a picture contemptible and worthless. It is far better for you and me to take it for granted, along with Sir David Wilkie, that we are not geniuses of such a high order as to produce works in which people will tolerate such wilful faults of omission and commission—such faults, for instance, as we pass over in Raphael and Phidias, in Turner or Tintoret—but first, selecting only such subjects of simplicity and originality as appeal to our hearts and are within the scope of our abilities, to strive patiently to carry out our work in an honest and straightforward manner, and make the very best job of it we are able. Everyone has some individuality, and if we work in this humble and conscientious spirit this individuality will be sure to display itself, and who knows but that sooner or later those who are true judges may accord to it the coveted name of genius? And even if this does not happen, our work will always have a certain value, as all honest and faithful attempts at the representation of nature always must. Let us choose simple subjects, and by hard conscientious work let us strive to make them interesting—that is the best advice possible. It is of not nearly so much consequence what the thing is that is painted as it is how it is painted. A white china tea-cup on a white table-cloth—there are very few people in this room who could render that simple subject satisfactorily—I am quite sure I am not one of them. It is such a capital exercise, though, to try, that I confidently recommend the subject to you. Do not despise this sort of work—honest conscientious work is the sure foundation of all true art.

### SCHOOL BUILDINGS IN BIRMINGHAM.

A REPORT from the Sites, Buildings and Repairs Committee was presented at the last meeting of the Birmingham School Board. It stated that the approval of the Educational Department had been obtained to the purchase of two additional sites for schools in Muntz Street and Garrison Lane, and in accordance with the resolution of the Board instructions had been given for the conveyances to be prepared and the purchases to be completed. The committee recommended that the architects be instructed to prepare plans for a school, to accommodate about a thousand children, to be erected on the site in Camden Street, the general arrangements to be similar to those adopted in the school in Stratford Road, and to include provision for teaching cookery. The report having been received, Mr. Kenrick proposed that the architects be instructed to prepare plans for a school to be erected in Camden Street. An amendment was proposed by Mr. Greening to the effect that the plans of the school be thrown open to competition. It was seconded by Mr. Ingall and supported by the Rev. T. J. Haworth. Mr. Kenrick, in reply, said he regretted the discussion which had taken place, because he necessarily spoke with imperfect knowledge. They had only one school erected and opened which had been built from competitive plans, and had had no opportunity of seeing how it worked. He had no fault to find with the school, but it was



not right to say it was perfect. The second school was not yet built, and it would not be opened before the middle of next year. Under these circumstances he said they had not given the experiment time to be completed, and therefore they could not be in a good position to judge whether it was successful or not. For that reason alone the committee would be justified in asking the Board to go on with the old plans before asking for new ones. The Department had put a bar to the extravagant expenditure of money by limiting the sum to 10*l.* per head. In the last school in course of erection they had to reduce something after the tender was accepted in order to bring the amount down to 10*l.* per head. If the competition was open they would have to pay 5 per cent. for the whole of the cost of building, whereas now they only paid their architects 5 per cent. up to a certain sum, and 2½ per cent. after. In reply to Mr. Greening and the Rev. W. H. Poulton, the Clerk said that they paid the architects 250*l.* a year salary for whatever work might be done. If they had work beyond 5,000*l.* they got an extra 2½ per cent. On the amendment being put 7 voted in favour and 7 against. The Chairman gave his casting vote against the amendment. On the resolution being put 7 voted for and 7 against. The Chairman voted in favour of the resolution, and the report was approved.

## Bygones.

"Antiquity after a time has the grace of novelty."—HAZLITT.

### HOW LORD ELGIN ACQUIRED THE PARTHENON SCULPTURE.

*Concluded from last week.*

DID Monsieur Choiseul take down any of the metopes and the frieze?—One piece of the metope and some of the frieze; the metope I bought at a public sale at the custom-house. It was at the time I returned from France; my things were dispersed all over the country, and my agent told me of some packages in the custom-house without direction, and I gave four or five-and-twenty pounds for them at a lumber sale.

Thinking those packages to be your lordship's?—Yes.

When your lordship heard of those cases being to be sold at a rummage sale, did your lordship make any application to the Government, stating that they had any interest in it, and that therefore you ought not to be obliged to purchase?—No, certainly not.

It was a matter of private purchase?—Yes; these things had been left at Athens during the whole of the French Revolution. Bonaparte allowed a corvette to call and bring these things for Monsieur Choiseul, who was an intimate acquaintance of Monsieur Talleyrand's: from the delay which occurred they did not get away in time to escape our cruisers. Monsieur Choiseul applied to me to make interest with Lord Nelson, and I wrote to him, and he directed them to be sent home, and applied to Lord Sidmouth and Sir Joseph Banks, wishing Government to make such a purchase as to secure the captors, but at the same time to restore the articles to Monsieur Choiseul. When I left Paris Monsieur Choiseul remained in the belief that they were still at Malta, consequently I had no clue to guess these were his at the time of the purchase in the year 1806; but I immediately wrote to him to state what these things were, as I had no doubt they were his by the metope; and in the year 1810 he wrote to me stating that his were still at Malta: when I went over to Paris last year I took a memorandum with me for him, and satisfied him they were his; but he has never yet sent about them, and I do not know what he means to do at all; but there they are, marked among my things as belonging to him.

Does your lordship know that, subsequent to your coming away, and during the time we were at war, any similar permission was applied for and obtained by the French?—I do not know anything about that; but, in point of fact, my cases were at the harbour during the whole of the war, and if the French Government had had anything they could have put afloat they would have taken them.

Did that seizure apply to the property of all English characters, or did it apply to your lordship's as a public character, and therefore the property of the country?—Besides the boxes at the harbour, Lusieri's magazines were filled in the town of Athens, and immediately after his flight they broke those open, and sent them to Yanana, and from thence to Bonaparte.

Was not Lusieri considered as an agent of your lordship's in your public character?—No, certainly not.

Your lordship had applied for him to do what he was doing, and was he not in that way considered as your lordship's agent,

and therefore subject to the same liability as your lordship was, to have whatever was in his possession seized?—He was considered as an English subject, as far as his connection with me went; but his property was stolen, in fact: his property and mine was promiscuously taken; they did not do it officially.

Was any objection made by the chief magistrate of Athens against taking away these marbles, as exceeding the authority received from Constantinople?—There was no such objection ever made.

Was ever any representation made of any kind?—None that I ever heard of.

Does your lordship believe, to the best of your judgment, that you obtained, in your character of ambassador, any authority for removing these marbles which your lordship would not have obtained in your private capacity through the intervention of the British ambassador?—I certainly consider that I obtained no authority as given to me in my official capacity (I am speaking from my own impression); the Turkish Government did not know how to express their obligation to us for the conquest of Egypt and for the liberality that followed from Government, and of course I obtained what I wanted; whether I could have obtained it otherwise or not I cannot say. Lusieri has obtained the same permission seventeen years, in the course of which time we have been at war with Turkey. Monsieur De Choiseul had permission under very different circumstances; but, in point of fact, I did stand indebted to the general goodwill we had insured by our conduct towards the Porte; most distinctly I was indebted to that; whether Monsieur Choiseul's example could be quoted or not is a matter of question.

In your lordship's opinion, if Lord Aberdeen had been at Constantinople at the time your lordship was ambassador there, could you have obtained the same permission for Lord Aberdeen as an individual that you did as ambassador obtain for yourself?—I can only speak from conjecture. The Turkish Government, in return for our services in Egypt, did offer to the British Government every public concession that could be wished. They were in a disposition that I conceive they would have granted anything that could have been asked; I entered upon the undertaking in the expectation that the result of our expedition for the relief of Egypt would furnish opportunities of this sort.

Then the result of the impression on your lordship's mind would be that other advantages granted by the Turkish Government were on the same principle as the permission to your lordship to remove these marbles, and rather out of public gratitude for the interference of England?—I believe it was entirely that, and nothing else. I was not authorised to make any application in the name of Government for this; but I wish it to be distinctly understood that I looked forward to this as that which was to enable me to execute the plan; and to that I am indebted for it. Whether under other circumstances I could have obtained the facilities Monsieur Choiseul had had before I cannot answer.

When your lordship received this, which you considered as a proof of the public gratitude of the Turkish Government to England, did your lordship mention the circumstance in any of your despatches to Government?—I should suppose not in any other despatch than that which has been alluded to.

That was upon leaving Turkey, was not it?—Yes.

If your lordship considers it as a mark of the public gratitude of the Porte to Great Britain, does not your lordship consider that mark of gratitude essentially connected with your character of representative of the Court of Great Britain at the Porte?—I did not ask it in that character, nor did I ask it as a proof of the disposition of the Porte, but I availed myself of that disposition to make the application myself.

Does your lordship suppose that if that application had been made at that particular period by any other person than the ambassador of Great Britain it would have been granted?—In my own mind I think it would, if he had had means of availing himself of it; that is to say, if he had determined to risk his whole private fortune in a pursuit of such a nature.

When your lordship mentioned that general disposition of the Turkish Government, do you mean that it was as well to individuals in their private capacity as to any demand made by the Government?—To everybody.

In short, it was a disposition of goodwill towards Englishmen?—Of cordiality towards Englishmen to an extent never known before.

In making the application to the Turkish Government for permission to remove these marbles, did your lordship state to them the objects you had in view in so removing them, whether for the purpose of collecting an assemblage of these things as matter of curiosity for yourself, or for the purpose of bringing them to this country for the improvement of the arts?—In explanation it must have been so stated; whether there was any formal application bearing upon your question I cannot undertake to say.

Was it or not stated to the Turkish Government that it was for the purpose of forming a private museum or for public uses?



—I am afraid they would not have understood me if I had attempted a distinction.

In what way did your lordship distinguish, in your applications to the Turkish Government, between your private and public capacity?—I never named myself in my public capacity, not having authority to do so; this was a personal favour, and it was granted quite extra-officially to me.

And asked as such?—Asked as such, and granted as such.

The firmans granted to your lordship were not, as the committee collect from your statement to-day, permissions to take particular pieces, one from the city and one from the citadel, and so on?—No, I had never been at Athens, and could not specify anything.

In point of fact, the firman was not so?—It was not; there could not have been an application for specific things.

Suppose the transaction had passed in this way, that your lordship was anxious to have some of these marbles, the Government were willing to grant you a limited permission to take one or two pieces?—Certainly it was not so; it must have been quite general.

Your lordship has no certain recollection how it was?—No, only that I did not know anything of the state of Athens, and consequently my application must have been general.

#### Second Day.

The Earl of ELGIN again called in and examined.

Will your lordship be pleased to state the view under which the collection was made?

[The Earl of Elgin, in answer, delivered in the following papers, which were read.]

"A letter dated London, February 14, 1816, signed Elgin, addressed to the Right Honourable Nicholas Vansittart.

"A memorandum as to his lordship's exclusive right of property in the collection, dated February 1816."

"A memorandum as to the delay in transferring the Earl of Elgin's collection to the public."

Has your lordship any account from which you can state to the committee the actual sums which your lordship has paid in obtaining these marbles, and in transporting them to this country?

[His lordship handed in a copy of a letter addressed to Mr. Long on May 6, 1811, with a postscript dated February 29, 1816, addressed to the chairman of this committee, which was read.]

Has your lordship any paper which exhibits the total?—No other than as it is stated in that letter, which I do not offer as a precise account, but it is merely to inform the committee what was the nature of the expense.

Was any specific offer as to price for obtaining those marbles for the public made to your lordship by Mr. Perceval, and in what year?—Yes; I believe it was a few days after the date of the above letter to Mr. Long, in the name of Mr. Perceval; he did intimate to me, as I understood, that Mr. Perceval would be disposed to recommend the sum of 30,000*l.* to be given for the collection as it then stood.

What passed in consequence of that offer?—I believe it is mentioned in the memorandum which I have given in accounting for the delay—paper marked No. 3—and which exactly states the grounds on which I declined the offer; it follows immediately after the extract from the Dilettanti publication, in these words:—"So that when Mr. Perceval, in 1811, proposed to purchase this collection, not by proceeding to settle the price upon a private examination into its merits and value, but by offering at once a specific sum for it, I declined the proposal as one which, under the above impressions, would be in the highest degree unsatisfactory to the public, as well as wholly inadequate either in compensation of the outlay occasioned in procuring the collection or in reference to (what has since been established beyond all doubt) the excellence of the sculpture, and its authenticity as the work of the ablest artists of the age of Pericles."

Mr. Vansittart never made any specific offer on the part of the public?—No, never except in what passed last year, which was afterwards dropped.

What further has passed relating to the transfer of those marbles to the public since 1811?—In the spring of 1815, Burlington House having been sold, Lord George Cavendish intimated a desire that I should remove the marbles from thence in consequence. I applied to the Trustees of the British Museum to take them in deposit, considering that the circumstances of the times might not make it convenient for the public to enter upon the transfer. In reply, the British Museum rejected my proposal as not being consistent with their usual mode of proceedings, and they appointed three of their members to enter into negotiation with me for the transfer, which nomination, after some discussion, led to the petition which I presented to Parliament in the month of June following.

Is there any price, in your lordship's estimation of these marbles, lower than which you would not wish to part with them?—No, there is no standard fixed in my mind at all.

Are there any persons by whom this collection has been valued?—Not any one, to my knowledge.

Are the gentlemen mentioned in the list you have delivered in designed on your lordship's part to be examined as to the value of the collection?—I gave in that list as thinking them proper persons, without consulting them on the occasion; they are the individuals best acquainted with the subject, and I fancy it would be satisfactory to the public that they should be examined.

Are there any and what additional articles now offered that were not included in the offer to Mr. Perceval in 1811?—To the best of my knowledge about eighty additional cases of architecture and sculpture have been added, and also a collection of medals.

#### GENERAL.

**Mr. Ernest Hart** has consented to deliver an address at the Parkes Museum, on December 20, on the subject of "The New Local Government Bill, especially in relation to Sanitary Administration."

**Mr. Gilbert D. Boulton**, of Kensington Studios, youngest son of Mr. R. L. Boulton, sculptor, of Cheltenham, has been successful in competition, and gained a scholarship at the Government Art Training Schools, South Kensington.

**Sir J. H. Thursby** has written to the Mayor of Burnley, offering to give a plot of ground of about 28 acres, and worth 20,000*l.*, as a public park for the town.

**Mr. Henry Tate** has signified, through Lord Derby, the president of the Liverpool University College, his intention of giving 16,000*l.* for the erection of the library block of the college. Mr. Tate's name will be associated with the new college library.

**Messrs. McDowall, Steven & Co.**, of Glasgow, have offered to the Corporation as a gift to the town the fountain they had erected in the Exhibition Grounds opposite the Museum Buildings. The Lord Provost, in accepting the offer, said the valuable gift was a good specimen of Glasgow work, of artistic beauty and finish.

**Professor Armstrong** opened the Engineering Class in Edinburgh University last week, and stated that the Senatus had decided to apply the bequest of 3,000*l.* made by the late Mr. J. Fulton for the equipment of a mechanical laboratory. In his address, the Manchester Ship Canal, the Forth Bridge, the piers of which were as high as the dome of St. Paul's, and the great engineering works throughout the world were noticed.

**Mr. Leader Williams**, engineer of the Manchester Ship Canal, and a party of English engineers and surveyors, visited Ballinasloe on Saturday, and inspected the new bridge and sluices, with the view of constructing similar works on the Manchester Ship Canal.

**The Gloucestershire Magistrates** propose that a portrait of Sir John Dorrington shall be painted and added to the series of portraits of previous chairmen of the County Quarter Sessions.

**The Industrial Exhibition** at Vienna, which closed on Friday, has cleared a sum of about 12,000*l.* net profit.

**The Promoters** of the Glasgow and Suburban Subways have, it is stated, owing to the opposition by the magistrates and Town Council of Glasgow, decided not to renew the application for it next session.

**The Theatre** which is to be erected at Buxton, for the Gardens Company, Limited, from the designs of Mr. W. R. Bryden, architect, will provide accommodation for 850 players. The gardens will be enlarged to the extent of 30 acres, as the Duke of Devonshire has offered the Serpentine Walks for the purpose.

**The Theatre Royal**, Cowcaddens, Glasgow, has been sold by auction with the adjacent buildings, comprising dwelling-houses, &c. It was knocked down to Messrs. Howard & Wyndham at the reduced upset price of 7,500*l.* The building was erected in 1867 at a cost of 30,000*l.*

**The Dundee Town Architect** estimates that 2,000*l.* will be required to restore the stone work of the town's churches.

**The Tower of All Saints' Church**, Bromsgrove, which has been built from the designs of Mr. John Cotton, of Birmingham, was dedicated on Wednesday.

**A Winter Exhibition** is to be held at Olympia, from December 1 to February 23, 1889. The main features are to be manufactures and industries, art galleries, a fair of all nations, promenade concerts, and a children's pantomime.

**Considerable additions** have been made to the hospital, Lodge Road, Birmingham, the ventilation of which has been carried out on the Boyle system, the latest improved form of the Patent Self-Acting Air Pump Ventilator being adopted for the extraction of the vitiated air.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment.

ROBERT BOYLE & SON, LD.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, NOVEMBER 9, 1888.

## THE ARCHITECT AND CONTRACT REPORTER.

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*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

### TENDERS ETC.

*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.*

*Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."*

### CONTRACTS OPEN.

BOOTH TOWN.—Nov. 16.—For Building Six Houses, Mr. Joseph F. Walsh, Architect, Waterhouse Chambers, Halifax.

BRADFORD.—Nov. 13.—For Additional Buildings at Fever Hospital. Messrs. Morley & Woodhouse, Architects, Swan Arcade, Bradford.

BRISTOL.—Nov. 9.—For Pulling Down No. 15 Clare Street, and Clearing Site. Mr. E. H. Edwards, Architect, 5 Clare Street, Bristol.

CARLISLE.—Nov. 9.—For Additional Buildings, Home and Castle Inn Farms. Messrs. J. M. Richardson & Son, 18 Bank Street, Carlisle.

CHESTERFIELD.—Nov. 14.—For Building Board School for Boys, with Fence Walls, &c., at Clown. Messrs. Robinson & Son, Architects, 13 Corporation Street, Chesterfield.

COVENTRY.—Nov. 17.—For Building Liberal Club. Mr. H. Quick, Architect, 28 Hertford Street, Coventry.

DOVER.—Nov. 13.—For Additions and Alterations to Mortuary. Mr. E. W. Klocker, Town Clerk, Castle Hill House, Dover.

DUBLIN.—Nov. 15.—For Building Labourers' Dwellings, South Dublin Union. Mr. W. M. Mitchell, Architect, 10 Leinster Street, Dublin.

ELLENBOROUGH.—Nov. 13.—For Alterations to Property. Mr. J. S. Moffat, Architect, 53 Church Street, Whitehaven.

ESKDALE.—Nov. 14.—For Building House, Boundary Walls, &c., Randall How. Mr. J. S. Moffat, Architect, 53 Church Street, Whitehaven.

FINSBURY.—Nov. 16.—For Construction of Underground Urinals, Water-closets, &c., South Place. Mr. H. Blake, Sewers' Office, Guildhall, E.C.

FULHAM.—Nov. 15.—For Building Board Room and Offices, Dispensary, Out Relief Offices, Porter's Lodge and Receiving Wards at Workhouse. Messrs. H. Saxon Snell & Son, Architects, 22 Southampton Buildings, W.C.

HALIFAX.—Nov. 12.—For Building Sanatorium, Crossley and Porter Orphan Home. Mr. John Ely, Architect, 24 Brazenose Street, Manchester.

HALIFAX.—Nov. 13.—For Reinstating Shop and Premises, Silver Street. Messrs. Horsfall & Williams, Architects, Post Office Buildings, Halifax.

HALIFAX.—Nov. 15.—For Building Eight Houses, Bruce Street. Messrs. G. Buckley & Son, Architects, Waterhouse Street, Halifax.

JESMOND.—Nov. 10.—For Building School for the Church Schools Company, Limited. Messrs. Oliver & Leeson, Architects, Bank Chambers, Newcastle-on-Tyne.

LEIGH.—Nov. 31.—For Alterations to the Town Hall, for the Leigh Local Board. Mr. J. C. Prestwich, Architect, Leigh.

LEIGH.—Nov. 31.—For Painting, Paperhanging, Decorating at the Town Hall, for the Leigh Local Board. Mr. J. C. Prestwich, Architect, Leigh.

SOUTHAMPTON.—Nov. 12.—For Partial Reconstruction and Reseating of Above Bar Congregational Church. Mr. W. H. Mitchell, Architect, 8 Portland Street, Southampton.

STARBECK.—Nov. 15.—For Building Church and Parish Room. Messrs. Hirst & Capes, Solicitors, James Street, Harrogate.

WINCHMORE HILL.—Nov. 23.—For Two Additional Pavilions and Additions, &c., to Administrative Block, Northern Hospital. Messrs. Pennington & Bridgen, Architects, 8 John Street, Adelphi, W.C.

### TENDERS.

#### AUGHIRM.

For Building Dispensary and Doctor's Residence at Aughrim, for the Rathdrum Union, Ireland.

M. Clarke, Wicklow . . . . . £468 10 2

#### BECKERMET.

For Building House, Beckermat. Mr. GEORGE BOYD, Architect, 134 Queen Street, Whitehaven.

#### Accepted Tenders.

J. Moffat, Egremont, mason	£285 0 0
I. Jenkinson, Egremont, joiner	151 10 0
W. Gilbeck, Gosforth, slater, &c.	125 0 0
W. Strathern, Whitehaven, plumber	28 0 0
T. Mossop, Egremont, painter	9 9 9
J. W. Selby, Hensingham, bell-hanger	4 18 0



## BRIGHTON.

For Supply and Fixing Patent Warm-air Ventilating Fire-grates, for the Central Board School. Mr. THOS. SIMPSON, Architect, 16 Ship Street, Brighton.  
J. GRUNDY, London (*accepted*).

## BUXTON.

For Building Theatre, St. John's Road, Buxton, for the Directors of the Gardens Company, Limited. Mr. W. R. BRYDEN, Architect, 31 Spring Gardens, Buxton.  
Brown & Sons, Salford . . . . . £3,626 0 0  
E. Dalton, Buxton . . . . . 3,540 0 0  
J. Gladwin, Buxton . . . . . 3,188 0 0  
J. SALT, Buxton (*accepted*) . . . . . 3,100 0 0

## CARDIFF.

For Street Improvement Works, Cardiff.

*Whitchurch Place, May and Minney Streets.*

W. R. Parker & Co. . . . . £772 0 10  
H. Gibbon . . . . . 613 12 2  
F. Osmond . . . . . 606 7 0  
T. Harries . . . . . 572 16 10  
J. Rich . . . . . 565 14 5  
T. REES (*accepted*) . . . . . 532 0 8

*Dalton Street.*

W. R. Parker & Co. . . . . 949 18 0  
H. Gibbon . . . . . 759 13 8  
Wild & Allen . . . . . 733 14 2  
F. Osmond . . . . . 679 11 6  
J. Rich . . . . . 641 0 4  
T. Harries . . . . . 636 2 10  
J. ALLAN (*accepted*) . . . . . 587 1 4

*Darran Lane, Darran and Llantrissant Streets.*

W. R. Parker & Co. . . . . 1,277 0 3  
F. Osmond . . . . . 1,069 12 8  
H. Gibbon . . . . . 1,012 3 9  
J. Rich . . . . . 905 7 0  
J. C. PEARSON (*accepted*) . . . . . 867 8 4

*Amherst and Ferry Lanes.*

W. R. Parker . . . . . 106 7 9  
J. C. Pearson . . . . . 81 11 0  
J. RICH (*accepted*) . . . . . 68 5 5

## COCKERMOUTH.

For Construction of Works of Sewerage for the Industrial School, Cockermouth.

Highest tender, Fisher & Co., Cockermouth . £419 13 0  
Lowest, JOHN REED, Carlisle (*accepted*) . . 294 18 2  
Seven tenders were received.

## DEVIZES.

For Building Steam Factory for the North Wilts Dairy Company, Devizes. Mr. J. A. RANDELL, M.S.A., Architect.

G. Brown, Devizes . . . . . £960 0 0  
R. B. MULLINGS, Devizes (*accepted*) . . . 955 0 0

## DEVON.

For the Erection of a Dwelling House on Little Haldon, near Teignmouth, for Captain R. Mitchell. Messrs. J. W. ROWELL & SON, Architects, Newton Abbot.

L. Bearne, Newton Abbot . . . . . £1,596 18 6  
J. H. Lamacraft, Dawlish . . . . . 1,554 0 0  
C. Francis, Teignmouth . . . . . 1,502 0 0  
F. A. Stacey, Newton Abbot . . . . . 1,445 0 0  
W. J. Hatcher, Dawlish . . . . . 1,439 0 0  
F. Barrow, Newton Abbot . . . . . 1,427 0 0  
H. Mills, Newton Abbot . . . . . 1,395 0 0  
E. ANDREWS, Teignmouth (*accepted*) . . . 1,389 0 0  
W. H. Cox, Teignmouth . . . . . 1,333 0 0  
C. Mortimore, Teignmouth . . . . . 1,308 16 0

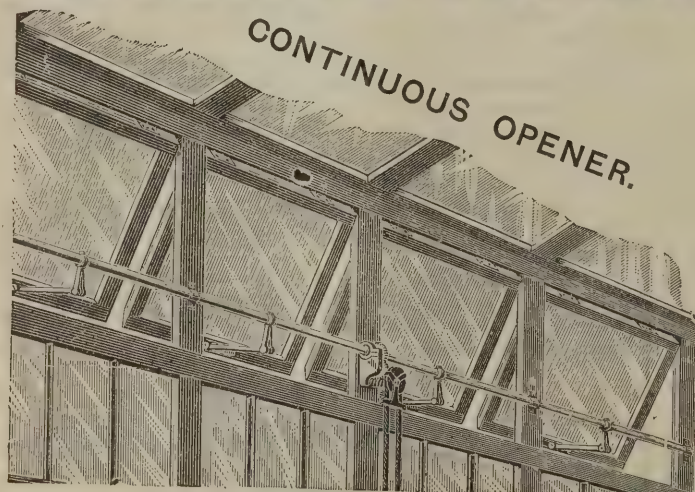
For the Erection of a Residence at Netherton, near Newton Abbot, Devon, for Mr. A. Reynell-Pack. Messrs. J. W. ROWELL & SON, Architects, Newton Abbot. Quantities by Mr. T. Mullins, Plymouth.

W. A. Goss, Torquay . . . . . £3,196 0 0  
F. Barrow, Newton Abbot . . . . . 3,172 15 0  
L. Bearne, Newton Abbot . . . . . 2,999 6 0  
F. Matthews, Babbacombe . . . . . 2,890 0 0  
J. Reed, Plymouth . . . . . 2,873 0 0  
H. Mills, Newton Abbot . . . . . 2,860 0 0  
P. Blowey, Plymouth . . . . . 2,780 0 0  
Sanders & Son, Torquay . . . . . 2,770 0 0  
E. V. Bovey, Torquay . . . . . 2,695 0 0  
F. A. STACEY, Newton Abbot (*accepted*) . . 2,680 0 0

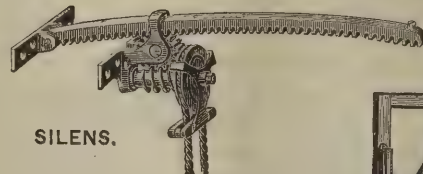
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BANGOR: N. Wales: Sept. 14, 1885.

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R. DAVIES Architect.

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**GREAT YARMOUTH.**

For Supply and Fixing Patent Warm-air Ventilating Firegrates, for the Northgate Board Schools. Messrs. BOTTLE & ALLEY, Architects, Regent Street, Yarmouth.  
JOHN GRUNDY, 30 Duncan Terrace, London, N. (*accepted*).

**HARROGATE.**

For Additions to Day-schools, Cheltenham Mount, Harrogate. Mr. T. BUTLER-WILSON, Architect, Leeds and Harrogate.

*Accepted Tenders.*

J. Dickenson, mason.  
W. Wilcock, joiner.  
J. Tyson, plasterer.  
D. Richmond, plumber.  
J. Shepherd, slater.  
A. Knowles & Son, painter.

**KIDDERMINSTER.**

For Supply and Fixing Patent Warm-air Ventilating Firegrates, for the Wesleyan Schools, for Mr. G. Holdsworth, ex-Mayor of Kidderminster.  
JOHN GRUNDY, 30 Duncan Terrace, London, N. (*accepted*).

**LONDON.**

For Supply &c. for Hanover School, Oxford Street, W. Mr. W. D. CAROC, M.A., Architect, 10 Portman Place, London, W.  
J. GARRETT & SON, Clapham (*accepted*).

For Road and Paving Works, Fulham. Mr. J. P. NORRINGTON, Surveyor, Vestry Hall, Walham Green.

*Cassidy Road.*

Neave & Son, Paddington . . . . .	£262	12	9
Turner & Sons, Chelsea . . . . .	275	0	0
Tomes & Wimpey, Hammersmith . . . . .	250	0	0
Nowell & Robson, Kensington . . . . .	225	0	0
Coat, Bridge Road, Hammersmith . . . . .	208	0	0

*Sandilands Road.*

Neave & Son . . . . .	759	1	5
Nowell & Robson . . . . .	686	0	0
Tomes & Wimpey . . . . .	680	0	0
Coat . . . . .	654	0	0
Turner & Sons . . . . .	635	0	0

**LONDON—continued.**

For Works at 11 Buckingham Palace Road, S.W., for Mr. J. H. Read. Mr. ARTHUR W. SAVILLE, Architect, 86 and 87 Strand, W.C.

*Alterations and Repairs.*

Drew & Cadman . . . . .	£291	0	0
Ward & Lambie . . . . .	238	0	0
Spencer & Co. . . . .	224	0	0
S. YARDLEY & SONS ( <i>accepted</i> ) . . . . .	224	0	0

*Fittings.*

Bowling & Govier . . . . .	235	0	0
S. Howlett . . . . .	205	0	0
S. YARDLEY & SONS ( <i>accepted</i> ) . . . . .	170	0	0

For Building Central Library, Lavender Hill, S.W., for the Commissioners of the Battersea Public Libraries. Mr. EDWARD W. MOUNTFORD, Architect, A.R.I.B.A., 22 Buckingham Street, Strand.

Shillitoe & Son, Bury St. Edmunds . . . . .	£6,199	0	0
M. Marsland, Wandsworth . . . . .	6,180	0	0
Longly & Co., Crawley . . . . .	6,166	0	0
Turtle & Appleton, Wandsworth . . . . .	6,144	0	0
Stimpson & Co., Brompton . . . . .	6,080	0	0
J. & J. Greenwood, Dockhead . . . . .	5,998	0	0
Scharien & Co., Chelsea . . . . .	5,997	0	0
King & Sons, Westminster . . . . .	5,995	0	0
W. Smith, Harleyford Road . . . . .	5,990	0	0
Perry & Co., Bow . . . . .	5,989	0	0
J. Allen & Sons, Kilburn . . . . .	5,958	0	0
W. Downs, Walworth . . . . .	5,954	0	0
A. Brickell, West Kensington . . . . .	5,936	0	0
J. T. Chapple, Piccadilly . . . . .	5,920	0	0
B. E. Nightingale, Albert Embankment . . . . .	5,870	0	0
Holloway Bros., Battersea . . . . .	5,852	0	0
C. Wall, Chelsea . . . . .	5,830	0	0
F. & H. F. Higgs, Loughborough Junction . . . . .	5,780	0	0
Hart Bros., Dover Street . . . . .	5,739	0	0
W. Johnson, Wandsworth . . . . .	5,700	0	0
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C. Kynock & Co., Clapham . . . . .	5,645	0	0
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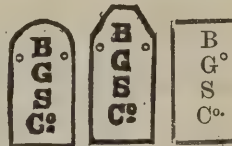
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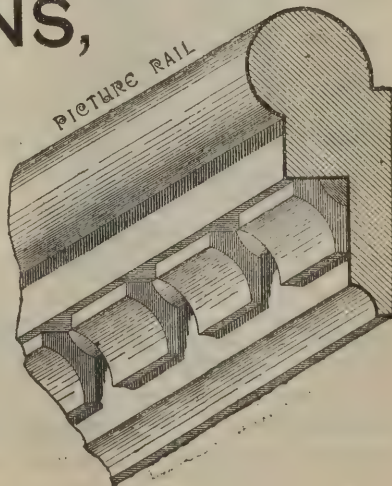
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## LONDON—continued.

For Alterations and Repairs at The Robin Hood, Holborn, for Messrs. Deakin & Crimmen. Mr. ARTHUR W. SAVILLE, Architect, 86 and 87 Strand, W.C. Quantities supplied.

## Builder's Work.

S. Goodall . . . . .	£372	0	0
W. A. Rhodes . . . . .	347	0	0
S. Yardley & Sons . . . . .	331	0	0
Spencer & Co. . . . .	325	0	0
WALKER (accepted) . . . . .	300	0	0

## Pewterer's Work.

F. J. Ruse . . . . .	49	7	6
WATTS & CO. (accepted) . . . . .	46	14	0

For Alterations and Additions to the Royal Standard Music Hall, Pimlico, S.W., for Mr. Richard Wake. Mr. H. J. NEWTON, Architect, 17 Queen Anne's Gate. Quantities by the Architect.

H. & E. Lea, Regent Street . . . . .	£3,887	0	0
Kirk & Randall, Woolwich . . . . .	3,820	0	0
Perry & Co., Bow . . . . .	3,450	0	0
S. Godden, Bryanston-Square . . . . .	3,420	0	0
Smith, Son & Fletcher, Belgravia . . . . .	3,383	0	0
J. Walker, Poplar . . . . .	3,357	0	0
H. Burman & Son, Kennington Park . . . . .	3,333	0	0
Jackson & Todd, Hackney . . . . .	3,300	0	0
J. Beale, Westminster . . . . .	3,184	0	0

For Building Public Library, Clapham. Mr. E. B. LANSLOW, Architect. Quantities by Messrs. Northcroft, Son, & Neighbour.

L. Whitehead & Co., Clapham Road . . . . .	£4,495	0	0
Stephens, Bastow & Co., Clapham . . . . .	4,372	0	0
B. E. Nightingale, Lambeth . . . . .	4,296	0	0
J. Garrett & Son, Clapham . . . . .	4,239	0	0
J. Tyerman, Walworth Road . . . . .	4,223	0	0
Kirk & Randall, Woolwich . . . . .	4,219	0	0
J. Miller, Clapham . . . . .	4,175	0	0
F. & H. Higgs, Loughborough Junction . . . . .	4,173	0	0
J. W. Sawyer, Clapham . . . . .	4,150	0	0
D. Charteris, Westminster . . . . .	4,048	0	0
Lathey Bros., Battersea Park . . . . .	3,990	0	0
J. Holloway, Lavender Hill . . . . .	3,949	0	0
Balaam Bros., Old Kent Road . . . . .	3,878	0	0
C. Kynoch & Co., Clapham . . . . .	3,865	0	0

## LONDON—continued.

For the Supply, &c., for Hampstead, N., New Conservatoire. Mr. ROWLAND PLUMB, Architect, 13 Fitzroy Square, W. J. GARRETT & SON, Clapham (accepted).

For Completing Four Houses, Colfe Road, Forest Hill.

T. Hillier, Thornton Heath . . . . .	£680	15	0
E. Sealy, Forest Hill . . . . .	551	0	0
H. Lupson, East Dulwich . . . . .	460	0	0
H. Norris, Forest Hill . . . . .	368	0	0
T. FREEMAN, Camberwell, S.E. (accepted) . . . . .	350	0	0

## NEWPORT.

For Building New Schools, Spring Gardens, accommodating 1,000 Children—Boys, Girls, and Infants—for the United District School Board. Mr. E. A. LANSLOWNE, Architect, Newport, Mon.

H. Parfitt, Cwmbran . . . . .	£5,900	0	0
I. Inwood, Malvern . . . . .	5,703	0	0
Gradwell, Barrow-in-Furness . . . . .	5,631	3	6
J. Linton, Newport . . . . .	5,485	0	0
G. Martin, Newport . . . . .	5,476	0	0
Moulton & Brownscombe . . . . .	5,448	0	0
G. Wilkins, Newport . . . . .	5,398	0	0
G. H. Bailey, Pontnewynydd . . . . .	5,300	0	0
H. A. Forse, Bristol . . . . .	5,260	0	0
W. PRICE, Newport (accepted) . . . . .	5,073	0	0

For Alterations and Additions to House, Maindee, for Messrs. Davis Bros. Mr. E. A. LANSLOWNE, Architect, Newport, Mon.

H. C. Parfitt, Maindee . . . . .	£130	0	0
Chas. Lock, Newport . . . . .	118	10	0
Fifoot & Son, Maindee . . . . .	115	10	0
A. Hazael, Newport . . . . .	115	0	0
P. CHAPMAN, Maindee (accepted) . . . . .	115	0	0

For Alterations and Additions to Endowed Schools, Caerleon, Mon., for Governors. Mr. E. A. LANSLOWNE, Architect, Newport, Mon.

CHAS. LOCK, Newport (accepted) . . . . .	£118	0	0
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For Alterations and Additions to Schools (Endowed), Blaenavon, for the Governors. Mr. E. A. LANSLOWNE, Architect, Newport, Mon.

John Burgoyne, Blaenavon . . . . .	£1,099	0	0
Thos. Foster, Abergavenny . . . . .	1,050	0	0

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C. T. Dennis, King's Lynn	£1,110	0	0
S. Hepwell, Grefield	1,081	2	7
R. Malabar, Liverpool	1,948	0	0
M. Hickling, Syston	960	0	0
J. Dickson, St. Albans	950	0	0
S. E. Hayne, Birmingham	918	15	10
Hughes & Son, Dudley	890	1	4
Lyon & Emmerson, Stamford	880	0	0
Nicholls Bros., Oakham	877	7	0
Gidman, Whissendine	854	0	0
C. Barnes, Melton Mowbray	849	0	0
Heatherley Bros., Coventry	849	0	0
T. BARLOW, Rothwell (accepted)	830	0	0
Clarke & Sons, Melton Mowbray	784	13	0

WORTHING.

For Restoration of Colonnade House, Worthing. Mr. ALFRED BROAD, Architect, A.R.I.B.A., 27 Dingwell Road, Croydon.

Saunders, Croydon	£559	0	0
W. Holt, Croydon	450	0	0
A. M. Deacon & Co., Norwood	393	0	0
Smith, Worthing	391	0	0
Sawle, Worthing	378	0	0
Smith & Bulled, Croydon	360	0	0
J. O. Richardson, Peckham	354	0	0
F. R. Docking, Croydon	350	0	0
A. CROUCH, Worthing (accepted)	325	17	0

SHIPLEY.

For Building Board School, Shipley. Messrs. W. & J. BAILEY, Architects, Bradford and Keighley.

Accepted Tenders.

J. Bairstow, mason	£3,359	0	0
Cryer Bros., joiner	863	12	0
S. Rushworth & Sons, plumber	429	0	0
E. Thornton, slater	345	0	0
J. Fitzsimons, plasterer	161	0	0

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For New Shop Front, No. 16 Victoria Street, Swindon, for Mr. Hemmins. Mr. WILLIAM DREW, Architect, Swindon.

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J. Walker, Rawdon, near Leeds, joiner.  
F. W. Greaves, Rawdon, near Leeds, plumber.  
A. Firth, Yeadon, plasterer and concreter.  
M. Edwards, Rawdon, painter.  
R. Hartley, Idle, slater.

TRADE NOTES.

WE have received from Mr. Wilson Hartnel, electrical engineer, Park Row, Leeds, a small catalogue in which most of the installations he has conducted are enumerated. Amongst them we notice the following clients:—Yorkshire College, Leeds; Barnsley Co-operative Society, Limited; Leeds Forge Company, Leeds; Thwaites Bros., Bradford; Marshall, Sons & Co., Gainsborough—out of a list of no less than a hundred installations for residences, manufactories, &c. This is very flattering to the efficiency with which Mr. Hartnel conducts his work.

THE scaffolding for the rebuilding of Lynn Church tower has been fixed and the work started.

THE parish church of St. Peter, Widmerpool, has been reopened. In the work of restoration a stained-glass window, by Messrs. Heaton, Butler & Bayne, has been placed in the west wall. The building is lighted by thirteenth-century lamps, supplied by Messrs. de Wilde, of Archer Street.

A PAINTED window is to be placed in the south transept window of the parish church at Cheltenham as a memorial of Mr. Brooksmith, M.A.

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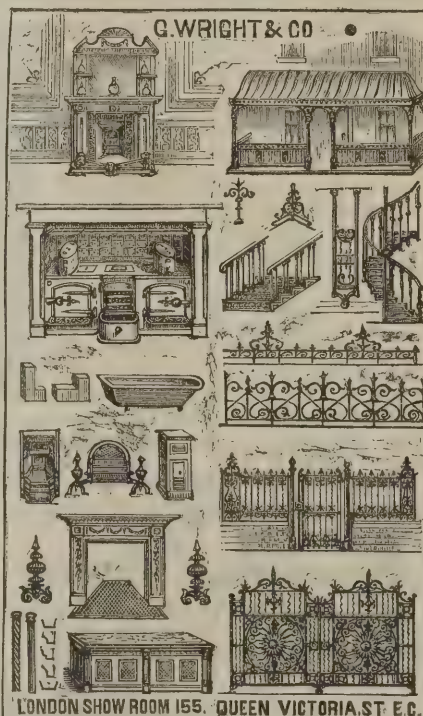
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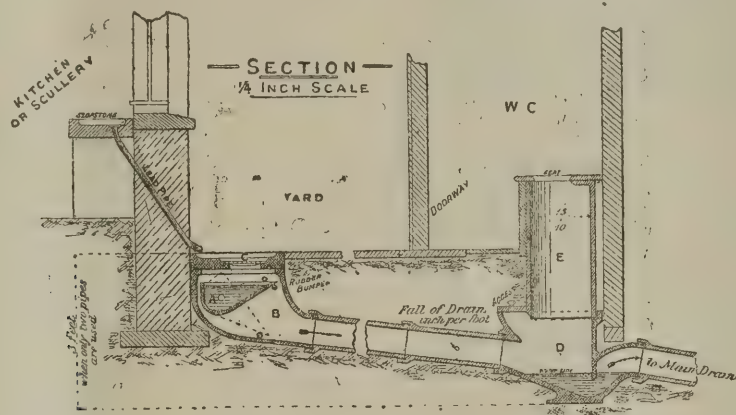
white lead used is ground on the premises, and, judging by the great demand made for the paint, it has special qualities. Mr. Ireland carries on several other industries on the same works—in whiting, plaster of Paris—putty, and has a large demand for Portland cement.

### NOTES ON NOVELTIES.

**Patent Water-closet for Cottages flushed with Slop-water.**—This apparatus, patented by Messrs. Duckett & Son, of Burnley, Lancashire, seems to us very ingenious, and well

with inlet and outlet in various positions to suit drains. The apparatus is simple, and, being made from salt-glazed earthenware, will be durable. We understand that it is now being adopted in Burnley, Brierfield, Nelson, Colne, Accrington, Rishton, Blackburn, and other places, and that it is highly appreciated by the property owners and the town officials. The application of slop-water for this purpose is very desirable, as it saves the town's water, which in many towns is an important consideration.

**Mouldings.**—In a recent visit to Leeds, we had the pleasure of inspecting the saw-mills of Messrs. W. Scupham & Sons—a firm whose reputation is not confined to the locality, but extends to



worth the attention of builders, architects, and property owners. Referring to our illustration—A is self-acting tilting vessel, of salt-glazed earthenware. It flushes 3½ gallons, and is supported with brass steps and axles to prevent corrosion. It tilts when nearly full, and discharges with great force through the closet trap. It is provided with rubber bumper to prevent liability to breakage. B is a salt-glazed earthenware box to receive the tilting vessel. C is a salt-glazed earthenware dish-brick, 20 inches by 18 inches by 4 inches, entirely covering tipper box. Grating, 7 inches square, secured with brass bolts to prevent children from removing it. D is closet trap made

every part of the country—and were extremely interested in looking over the numerous departments, for the evidence of unusual enterprise is seen in everything. In the first place, the firm import their own timber and season it. There are departments for making furniture, picture frames, every description of door furniture, railings, balusters, and particularly mouldings. They are the manufacturers also of Longbottom's patent adjustable lock furniture, in ebony, oak, partridge, walnut, and other woods. Messrs. Scupham & Sons claim a special advantage in manufacturing entirely from well-seasoned timber, and guarantee the durability of their work. We should certainly

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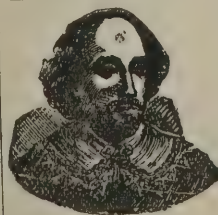
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say, from an inspection, that it would be difficult to excel the firm either in quality or price.

#### BUILDING IN GREENOCK.

At the last meeting of the Greenock Dean of Guild Court Dean Jameson gave an account of the business done during the twelve months ended 1st November. The number of processes for formation and levelling of streets and the construction of sewers was 38, a decrease of 9 as compared with last year. Petitions for new buildings and alteration of buildings 182, an increase of 53. Petitions for street openings for water supply, service drains, &c., 509, an increase of 360. Petitions for hoards for buildings 32, an increase of 8. The total increase on the number of the various petitions was 412. The Court sat 28 times, and there was only one appeal, in which case decision was reversed by the Court of Session. Amongst the buildings for which plans were passed were ten tenements, a hall and school, 20 for miscellaneous business purposes, and 57 for sanitary improvements. Accommodation has been provided in the plans passed for 53 families. The number of buildings in course of construction or undergoing alteration at the present time is 25, including 8 tenements. Owing to the decision of the Board of Police for dispensing with the Dean of Guild inspector of buildings, the additional work done in the Master of Works' department, exclusive of examination and reporting on plans, &c., has been very great, involving no fewer than 3,016 visits of inspection, while the notices sent out numbered 549. Although the cases had increased, the value of the properties passed was 29,000*l.* less than last year. It was explained, however, by Mr. Turnbull, master of works, that there had actually been a great deal more work going on than during the previous year. The value of the work which had been going on was 34,200*l.*, while in 1886-87 the value of the work carried out was only 32,600*l.*

#### SOCIETY OF ENGINEERS.

At a meeting of the Society of Engineers, held at Westminster Town Hall, on Monday evening, November 5, Mr. A. T. Walmisley, president, in the chair, a paper was read on "The Practice of Foundry Work," by Mr. H. Ross-Hooper.

The paper briefly compared the particular qualities and properties of pig-iron, with the view of determining the varieties

which are best adapted to the requirements of the different kinds of castings made; and showing how the nature of cast-iron depended not only upon the amount of carbon that it contained, but upon the conditions under which that carbon existed. The author then proceeded to illustrate how the failing of portions of a cast-iron structure may be traced to a want of knowledge in the way the lines of crystallisation flow on the cooling of the metal, and mentioning the weak points to be guarded against in the designing of cast-iron work. Moulding or the production of a hollow mould to receive the metal was next considered; for to mould melted iron into any required shape or form two things are necessary, (i) a pattern of the article to be produced, (ii) a substance which will retain the impressions of the pattern made upon it and resist the violence of the metal when poured therein. To make a pattern a man requires to be thoroughly conversant with the principles of moulding, to so construct it that it may give a minimum of trouble to the moulder; the materials used for pattern making and the general essential points of this branch being touched upon. The differences between green and dry sand moulding, the requisites of a good foundry sand, and the mode of preparing a mould for a small girder bed-plate were entered into in detail, noticing those particulars which should be observed in the construction of sand moulding, and showing the uses of cores and the method employed in their formation, both large and small.

The author next proceeded to describe the features of loam moulding, illustrating (by means of a working model) the process of constructing a mould for a drum capable of holding 200 feet of 1-inch wire rope used in the erection of the Sukkur Bridge, India.

After explaining the operations of chill casting, malleable cast-iron, and the system of moulding known as "Jobson's Blocks," whereby sand moulds of thin delicate patterns can be made by ordinary labourers, the author mentioned the different modes adopted for casting according to the forms and requirements of the various articles to be produced, and how sound results can only be obtained by a careful attention paid to the feeding of the metal to supply the shrinkage and drawing away which must inevitably occur on the cooling of the metal. The cupola, its construction, and advantages over other types of furnaces, and the manner of charging it, together with the appliances necessary to a foundry in the shape of drying stoves, laddles, cranes, &c., and a "fettling shop" for the ultimate cleaning and dressing of castings were duly considered.

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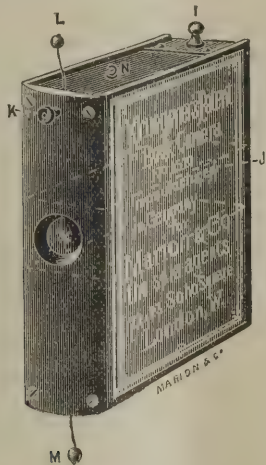


The author then treated on the examination of cast-iron work and the care that should be observed in all inspection of the same, and finally discussed the tests usually applied and the general strength of cast-iron.

### DR. KRUGENER'S PATENT BOOK CAMERA.

THERE has arisen such a large demand for a small camera of convenient and portable size that much attention has been paid to improving this useful invention, and we believe it has been patented in Dr. Krugener's patent book camera.

This camera, as its name implies, is like a book, and, with nothing to denote its purpose, can be used secretly, and is therefore a real detective camera.



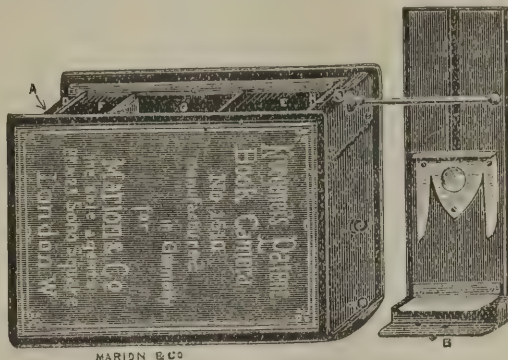
It holds twenty-four plates—size 4 ct., or 1½ inches, which are exposed in rotation.

The plates are held in metal sheaths—Samuel's patent.

#### Preliminary Explanation.

To open the camera you turn back the catch A, slightly raise the end of the lid B, and pull it out towards you. It will

require rather a smart pull, for the other end of the lid fits somewhat tightly beneath the cross-piece C. To close the



camera, push the lid well underneath the cross-piece G, then bring down the other end, and fasten the catch A.

The dry plates must not be exposed to ordinary light; the insertion must therefore take place in a dark room, or at night time in any room, but only using a lamp with ruby glass or fabric specially made for the purpose. The sensitive plate is inserted into the sheath film side uppermost. Handle the edges and back—fingers on the film side would leave marks. The sheaths are numbered, and should be arranged on the left hand, No. 1 uppermost. Take a sheath by the edge with the thumb and middle finger, and with the forefinger press the bulge of the sheath flat, then with the other hand insert the dry plate, holding it only by its edges, film side uppermost. The bulge in back of sheath acts like a spring, and keeps the plate in its place. When all the sheaths are filled they may then be inserted into the camera. No. 24 is now on top. Slip the sheaths, metal side uppermost, underneath the bar D; the edges fit the metal sides of camera, and slide easily forward to the compartment E, where the metal spring platform should be slightly depressed to allow the sheath to slide over it and under the clamp H. In inserting the sheaths see that the figures on the backs are upright, not upside down. This operation is repeated till all the twenty-four sheaths are in the compartment E. No. 1, however, is not pressed home, but remains in the middle space G, opposite the lens.

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As stated above, No. 1 sheath is placed over the middle space G, opposite the lens; No. 2 is the top sheath on the platform of compartment E. After the exposure of No. 1, the pusher, I, is pulled out as far as it will go, and then pushed in again close up. By this action the projections or teeth underneath each side of the pusher catch the sheath on spring platform, causing it to move forward, and to push the sheath, previously in position, on to the spring platform of compartment F. This compartment receives all the exposed plates. In order to see that each sheath is pushed forward, there is a little window at J; move aside the cover and the number on back of sheath may be seen. As each bears a consecutive number, it is easy to see if the change has been properly made. Should any sheath not move forward easily, tap the sides or bottom of camera; and if it still resists, pull the knob K, which causes the spring platform to become depressed at one end. Such obstruction will arise from not pulling out and pushing in the pusher the full distance. Empty sheaths must never be inserted in the camera, for they will also cause obstruction.

In setting the shutter pull out gently the string fastened to bead L till a spring is felt to catch—the shutter is now set; then, to fire the shutter, pull out the string of bead M at the bottom of the camera, and when this is fully out it causes the shutter to be released and to descend swiftly past the lens. L is connected with the real shutter; M merely with a safety slide which closes the aperture before the lens. The safety slide is a great advantage, as it allows the shutter to be set previous to exposure without danger of light getting into the camera, so that when the opportunity of taking a picture occurs the exposure can be effected without delay.

The above is the operation for instantaneous exposures. But when a longer exposure is necessary, fasten back the bead L to the eye N; this keeps the shutter open before the lens. It now only remains to pull down the safety slide, when an exposure can be made as long as the string is held. By releasing it the safety slide closes automatically by a spring.

The lens is designed especially for the book camera by one of the best opticians in Europe, and is composed of the achromatic system of lenses (*i.e.* of four lenses) made from the new Jena optical glass. It will be found to give very sharp pictures and correct perspective. Occasionally the front and back outer glasses should be cleaned. For this purpose a small stick covered with leather at one end is supplied. In using, move it with a rotatory movement over the faces of the glasses, and do not apply much pressure. The front glass is got at by

setting the shutter as if for a long exposure, and the back glass through the middle compartment G.

#### Exposure.

To expose, or make the picture:—The apparatus being filled with plates, and No. 1 sheath being above the middle compartment opposite the lens, the shutter should be adjusted as described before, namely, the string of L pulled up, the camera being held under the arm, and when the opportunity for a picture offers, the string of M must be pulled down; this causes the exposure. During the exposure the camera should be held firm and steady against the body.

Things necessary to secure correct exposures and perfect photographs comprise:—1. To practise holding the camera. 2. Position of camera relative to size and nearness of object. 3. Light.

As regards the first, in holding the camera during exposure it is necessary that it should be held upright and held steadily. It would be well for the beginner to practise this a little with the camera empty. A good position is under the arm, pressed firmly against the body, and at the moment of exposure standing quite firm and steady. The camera can be used in other positions—against the chest, or held level with the eyes, &c., but for long exposures it should be placed on some support.

As to the second, the position of camera relative to size and nearness of object:—When the person, group, or object to be photographed is at a distance of five to six paces, the camera should be held the height of the waist. If at ten or twelve paces, then as high as the chest. If at greater distances, then it should be held level with the eye, and the object sighted over the top of the book. In taking full-length portraits of children two to six years old the camera should not be more than a foot from the ground. With the book camera under the arm and the lens pointing behind it is possible to take the portrait of a person walking behind us. This may also be done if a person be quite close to the operator. The apparatus may be held in the hand, and the shutter (see previous description) left off when the person is, say, within four paces; in this manner very fine bust portraits can be taken, which are remarkable for sharpness and natural expression. With a little practice distances can easily be estimated, and then satisfactory pictures can always be obtained. We again repeat, whilst the picture is being taken the camera must be held very steady.

Thirdly, on light:—The book camera is principally intended for use in the open air and in a bright light; that is to

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say, it should not be used in narrow dark streets, or at objects under the shade of trees or buildings, and, of course, not in interiors unless a long exposure is given. But when the camera is set for long exposure (as described before under setting the shutter) and resting on some firm support, such as a table or a wall, then it may be used anywhere, sufficient time being given for the exposure. This will vary according to the amount of light—for instance, in a well-lighted interior about eighty seconds, in a badly-lighted interior say from five to eight minutes. A little practice will soon give the user the power of judging. The lens is some distance in the camera, therefore it is not necessary that the sun should be always behind one's back unless very low down in the sky.

The following rules are important :—1. Whenever a picture has been taken another sheath must be immediately pushed forward in its place, and the number of the displaced sheath should be noted. There will then be no doubt that the sheath in position behind the lens has never been exposed.

2. If only a certain number of the twenty-four sheaths containing the sensitive plates has been exposed, and it is desired to develop them, the one over the middle compartment must remain, and only those in compartment F removed for the purpose of development.

3. When a sheath with the sensitive plate is being shifted, the cover of the window J must not be left open. It should only be opened before or after. The window is only opened to make sure that the consecutive number is really in its place.

4. The camera should not be exposed unnecessarily to the sun; however, in diffused light it may be carried under the arm.

Dr. Krugener notes that, in order to spare disappointment to those who wish to use the pocket-book camera in the autumn or winter, and who are but little acquainted with the nature of photography, it should be mentioned that the action of the light on the photographic plate is much feebler from October to March than during the summer months. In the winter months, therefore, the picture should be taken only about mid-day, say from 12 to 2 P.M. at the latest, and then only in very clear weather, except when snow has fallen, and then good pictures may be obtained in less clear weather, if the distance is of no importance. At the commencement of spring the action of the light increases very rapidly and attains its greatest intensity in the months of May, June, July, and August, and diminishes quickly towards the end of September. The apparatus then must not be found fault with if a successful

picture cannot be obtained at four o'clock of an October afternoon, but by carefully following the instructions a good result will certainly be obtained.

#### *Development of Plates.*

The pictures taken with the pocket-book camera should never be developed with the ferro-oxalate developing solution, as the deposit with the same is not sufficiently delicate, and this detracts greatly from the sharpness. The developing solution made with pyrogallic acid is the best, as very sharp and detailed small negatives can be obtained with it, and owing to its great strength and its being easily manipulated, it should always be employed for instantaneous photographs. The following formula has proved very serviceable for developing the plates supplied with the pocket-book camera :—

1. Dissolve 1 oz. 6 drachms of crystallised pure carbonate of soda, and 1 oz. 12 drachms of pure crystallised sulphite of soda in  $1\frac{3}{4}$  pints of spring water, and let the solution be filtered, or allowed to settle until it is clear. Also :

2. Dissolve 1 oz. 1 drachm of sulphite of soda in  $3\frac{1}{2}$  oz. of water, and add diluted sulphuric acid (1:10) until blue litmus paper is slightly reddened by it; 154 grains of pyrogallic acid are then added.

In order to develop six pictures, take 7 drachms of Solution 1, 51 minims of Solution 2.

Those who prefer not to trouble themselves with preparing the developing solution can obtain it ready mixed from the firms which sell Krugener's pocket-book camera, and instructions for use are supplied at the same time. In order to carry out the developing process conveniently, and since the plates, owing to their small size, cannot well be held between the fingers, each plate should be secured in a small holder specially constructed for the purpose, so that it is turned upwards, and therefore stands above the developing tray.



Six plates should be placed with their respective holders in a suitable tray, which is so arranged that 7 drachms of fluid will be sufficient for developing. When the plates have been developed, they are placed for a minute in a thin alum bath (1 part

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THE ABOVE VARNISHES ARE TESTED BY PRACTICAL PERSONS BEFORE BEING SENT OUT AND THE QUALITY IS WARRANTED.

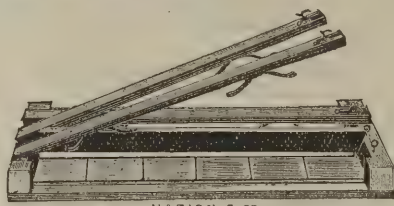
SAMPLES AND LIST FREE ON APPLICATION.



to 10 of water), and afterwards in the fixing hyposulphite of soda bath (1 part to 4 of water). After the plates are fixed they are placed upright in the washing vessel, which is effected by laying the holder on its side. When the plates have been thoroughly washed they are set to dry, but still remaining between the holders, from which they must not be removed until they are completely dry. It will be readily perceived how convenient this manner of preparing the plates must be, since the fingers do not come at all in contact with the baths. As the holders are very cheap, a stock should be bought, so that they may never run short. These holders and the developing trays are also to be obtained from the above-named firms.

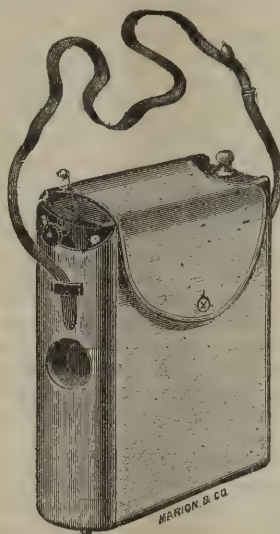
#### Printing the Pictures.

In order to print the negatives, a specially constructed printing frame must be employed in which ten pictures can be printed at the same time. These printing-frames do not cost more than others, and can be obtained from the firms which supply the cameras. Those who wish to enlarge the negatives afterwards with Marion's enlarging apparatus must take care to



keep them thin while developing; that is, they must not be over-developed. The addition of bromide of potassium is not necessary for this purpose, since it is only a question of the details in shade. Keeping the negatives thin is advantageous in two ways, since they then serve for producing a good enlargement and also for printing on "Aristo" paper. For printing these delicate negatives the chloride of silver collodion paper, known as "Aristo" paper, is the most suitable. This paper reproduces all the details so truthfully that the small pictures appear larger than they really are. This paper can also be handled easily and safely, which is worth the consideration of amateurs. Precise instructions for use will be found contained in each packet, so that they need not be repeated here. Moreover, it is not intended to convey precise instruc-

tions here respecting the whole process, but merely to give hints which may lead to satisfactory results. The wonderfully brilliant pictures produced by Krugener's pocket-book camera



result from the combination of favourable conditions, such as glass plates, a very sharp objective, a developing solution which gives a very fine deposit, and printing on "Aristo" paper. The first two conditions are inherent in the camera, and whoever attends to the last two cannot fail to obtain highly satisfactory results.

Messrs. Marion & Co., of Soho Square, London, W., are selling these cameras at a price which is within the means of the youngest student, viz. 65s., including twenty-four metal sheaths.

#### EDINBURGH WATER-SUPPLY.

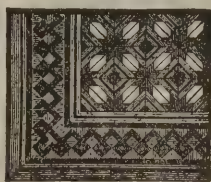
THE opening address of the East of Scotland Engineering Association was delivered by Mr. J. B. Bennett, C.E., president of the Association, who chose for his subject "An Historical Sketch of the Edinburgh Water-Supply." It was stated that

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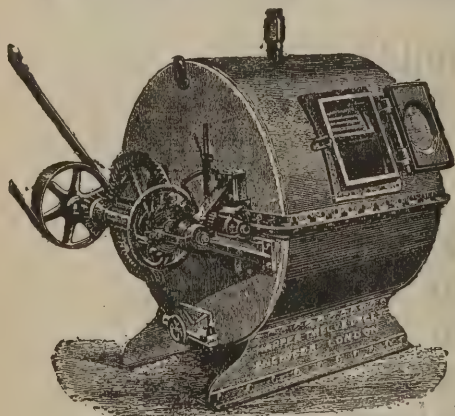
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**METAL KEYS,**  
And by an  
Adhesive & Preservative Mastic  
Speciality: OAK AND DARKENED OAK.



the first Act of Parliament authorising the introduction of a water-supply to the city was obtained in 1621, though no steps were taken to carry out the scheme till 1674, when Peter Bruschi, a German, was employed to bring in water from springs at Comiston by means of a lead pipe 3 inches in diameter to a cistern on the Castlehill, at a cost of 2,950*l*. The quantity of water thus supplied was equal to 4½ gallons per head per day, and at first five public wells were considered to be sufficient for the wants of the inhabitants, though this number was soon doubled. A further Act was obtained in 1755, and in 1791 the water of springs at Bonaly was led into the city by means of cast-iron pipes. Up to the end of last century no special water-rate had been imposed, but further supplies being necessary, the Edinburgh Water Company was incorporated in 1819, and took over the existing works, and in 1822 introduced the Crawley water-supply, which raised the quantity provided to twenty gallons per head per day to the combined populations of Edinburgh and Leith, though the supply was not extended to the latter place till 1826. The various sources of supply acquired by the water company and the works executed under the superintendence of its engineers—Mr. Jardine and Mr. James Leslie—down to the time of their transfer to the Water Trust in 1870 were described, and reference was made to the Parliamentary struggles connected with the creation of the Water Trust and the St. Mary's Loch Scheme of 1870 promoted by that body, the Bill for which was rejected by the House of Lords Committee after having been passed by the Committee of the House of Commons. The Moorfoots works executed by the Water Trust and the present proposals for an increased supply were considered.

#### THE BRITISH DEPARTMENT IN INTERNATIONAL EXHIBITIONS.

THE absence of interest by the Government in the British section of foreign exhibitions has drawn from Mr. G. Collins Lesley the following remarks:—

It is not too much to assert that the position occupied by this country at every continental exhibition since that held at Paris in 1878 has been the reverse of creditable. Our Government has jumped from one extreme to the other. After being generous, perhaps lavish, in its expenditure at Paris in 1867 and 1878, at Vienna in 1873, and at Philadelphia in 1876, it

made a *volteface* and rushed to the other extreme. The British court at the Melbourne Exhibition of 1880-81 was only prevented from failing, so far as decoration was concerned, through the personal popularity of Sir Herbert Sandford, who was the representative of the Royal British Commission, and the good feeling of the local commissioners, who fitted up the British court out of their own funds, so that it was enabled to compete successfully with its neighbours—France, Germany, Italy, and Austria.

Again, at Amsterdam in 1883 and at Antwerp in 1885 the representative of the British exhibitors had to do his best without any official countenance or support to make his court look presentable, while those of France and Germany had the advantage of a large expenditure by their respective Governments.

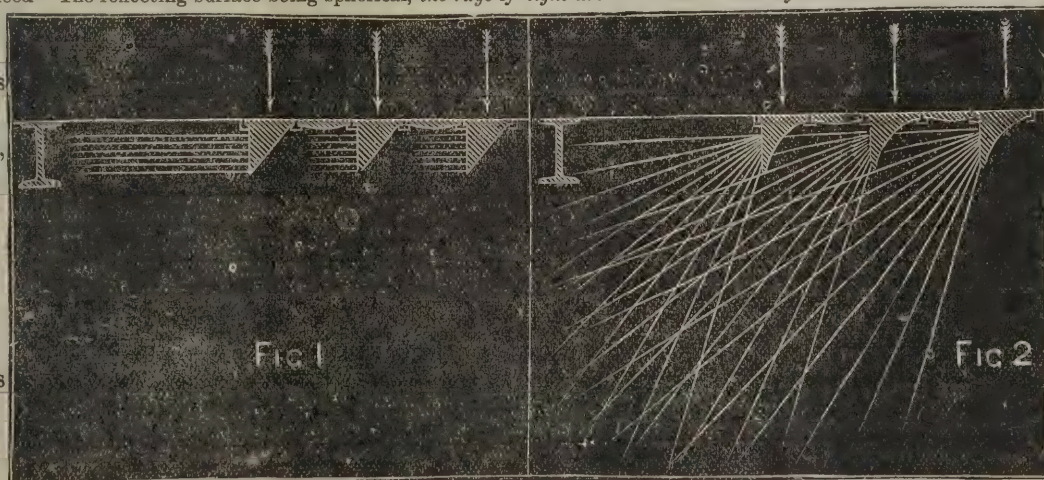
A small vote was indeed granted for the Adelaide Exhibition of last year, and this country had the advantage of being represented by Sir Herbert Sandford. But the Melbourne papers are loud in their complaints about the parsimony of the British Government at the exhibition now being held at the capital of Victoria, and contrast with no advantage to this country the difference presented by the appearance of the British and the German courts. The truth is that the Royal Commission appointed by this country for the Melbourne Exhibition contented itself with getting together a large collection of loan paintings, intrusted the representation of British interests to a local banker, Sir George Verdon, and endeavoured to throw the cost of decorating their court, as in 1880, upon the colonial commissioners.

I am afraid that the poverty of the British court at Barcelona is the fault of the Spanish officials who organised the exhibition and made two blunders in its management—the first being that they postponed the date for holding it from 1887 to 1888; the second, that they confided their interests in this country to something like a score of gentlemen, myself included, without telling any of us very clearly what we had to do, paying very much heed to our recommendations, or making it worth our while to take much interest in the Exhibition. I do not think that the Exhibition at Copenhagen was ever brought very prominently before the British public, and the court at Brussels is wonderfully good considering that Mr. Lee Bapty had no assistance from either Government or committee, and it had the merit of being the only portion of the Brussels Exhibition which was ready at anything like the date appointed for the opening.

## Wilson's Patent Dioptrical Pavement Lights.

WILSON & CO. beg to call the attention of Architects and others to the superiority of Wilson's Patent Dioptrical Lenses for pavement and floor lights. These Lenses are constructed on strictly scientific principles, and have been approved by some of the highest authorities on Light. They are made of the Best English White Flint Glass of high refractive power, and transmit more light than any other form of Lens yet introduced. The reflecting surface being spherical, the rays of light are distributed in every direction.

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Fig. 1 shows how the ordinary prism or semi-prism, by receiving the rays on a plane reflecting surface, throws them forward at one angle only, in parallel lines close to the ceiling.

Fig. 2 represents the Patent Dioptrical Lens, and shows by comparison how the rays of light, striking on the curved inner surface, are reflected forward through the face of the lens in every direction, filling the whole angle of 90°, thus illuminating the apartment from floor to ceiling and from wall to wall.

From the above diagram it will be seen wherein consists the advantages claimed for Wilson's Patent Lenses. The objection to the semi-prism is that it reflects the light, as shown in Fig. 1, at such an angle as to be of little use, and more especially if the line of the ceiling in below the line of the pavement; then the value of the semi-prism as a light projector is entirely lost.

It will be seen also, on reference to the above diagrams, in Fig. 1 that the first row of semi-prisms obstructs the rays of light from each succeeding row, whereas in Fig. 2 the bulk of the rays of light are projected at such angles as to pass unobstructed into the room.

The correctness of these illustrations can be practically demonstrated to any architect desirous of testing them.

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In conclusion, I can only hope that the appearance which Great Britain will present next year at Paris will warrant felicitations. Rumour has it that the large fees for space which the Mansion House Committee were compelled to charge has had a very depressing effect upon the number of the exhibitors, and that at least one important industry will be conspicuous by its absence. It seems quite certain that, at any rate in the area of space which it will occupy, the British court at Paris in 1889 will compare very unfavourably with the magnificent display organised by Sir P. Cunliffe Owen under the direction of the Prince of Wales in 1878.

#### A SPANISH RAILWAY.

THE Anglo-Spanish line from Zafra to Huelva has been opened, and, according to the *Times*, it has special importance for those interested in the success of English enterprise in Spain. It is an important trunk line, which has not merely been built by English capitalists, but which in part for some time past and now in its entirety will be worked on English principles. The undertaking is one of the first magnitude. The difficulties overcome in traversing at right angles the Sierra Aracena, a spur of the Sierra Morena, have been immense. Instead of traversing the Sierra superficially, the promoters have pierced it with tunnels, and deep precipitous cuttings have been made through the solid rock, of which six million cubic metres have been removed. Aerial bridges and viaducts span the rivers and the deep chasms, and a lofty embankment forms no inconsiderable section of the line. This railway, in the most unexpected manner, after crossing the inhospitable Sierra, opens up smiling, fertile valleys, whose fruits and wines have hitherto been shut out from the world. The owners of the mines of copper, silver, nickel, and lead, and quarries of marbles, rivalling those of Carrara for white and those of Algeria for coloured stone, will also now find an outlet for their productions, and these mines are already being developed in a manner more American than Spanish. The railway further places the province of Estremadura, the cereal granary of Spain, in direct communication with the heart of the Peninsula.

The line has taken seven years to construct, the work being carried on without any interruption, and in the tunnels

by day and night. Sixty-seven kilomètres on this side of the Sierra have been open for two years, and already yield for the traffic per kilomètre nearly double the average of that on other Spanish railways, the result being partly due to the cheap rates and frequent trains. Facilities for traffic are entirely ignored on other lines, and their mismanagement is a public scandal, which the present energetic Minister of Public Works is attempting to remove. Ten millions sterling of British capital are invested in this district. The Zafra railway has cost two and a-half millions, raising the total to twelve and a-half millions. Señor Canovas del Castillo in his inaugural speech did full justice to the good work accomplished by English enterprise, and his declaration that foreign capital in Spain was well employed, and that its employment deserved and would receive protection, elicited hearty applause from the large assembly which he addressed. The inauguration passed off without hitch or accident of any kind.

#### THE CARDIFF EXHIBITION.

HAVING spent a few days at the Cardiff Exhibition, we must say that few Exhibitions have struck us so forcibly for good arrangement, compactness, and variety of interest. The great part of the exhibits are local, and it reflects great credit on Cardiff that it can contribute so largely. The visitors so far have numbered about 150,000, and seem to have entered keenly into the merits of the various improvements, inventions, &c. We do not propose to go into details as to the exhibits in the present issue, but we may enumerate a few of the most prominent firms. Mr. Robert Adams exhibits his reversible safety securing window sashes, his unexcelled door springs, &c., under the supervision of his energetic manager, who is so well known to the frequenters of exhibitions. Messrs. Corfield & Morgan, Cardiff, have a splendid collection of marble mantelpieces, and a novelty in marble overmantels, which has an excellent effect; indeed, we have seen nothing to excel their exhibit. In bricks, the Cattybrook Brick Company, Limited, Bristol, exhibit every variety, the noticeable feature of which is their splendid terra-cotta colour and their peculiar smoothness. Mr. R. Scholefield of Leeds, has erected quite a brickmaking plant, illustrating the merits of his patent machinery, which insures both economy and efficiency. Messrs. Kotyra, Jouki & Co. have

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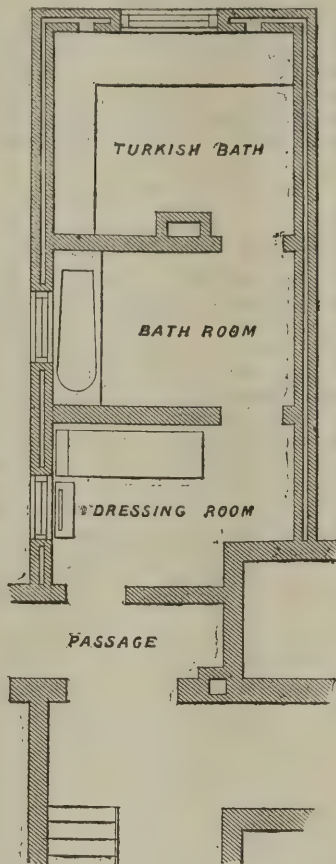


an interesting exhibit of electric bells. Messrs. Barstow & Sons, of Pontefract, filters which have recently been awarded the highest medal at the Brussels Exhibition. There is a local firm represented doing a good business in driving tube wells, viz., Messrs. H. H. Raynard & Co. We understand that the specimens here are capable of delivering 1,000 gallons of water per hour, but we shall refer more in detail to them in a subsequent notice. Mr. C. E. Gurnsey, of Bristol, sends an excellent variety of lamps and lanterns for street lighting, that are equal to anything we have seen in this way. The Cardiff Granite Company exhibit their improvements in this industry, which we shall refer to in a subsequent notice. Messrs. Cotterill Bros., Bristol, the well-known paperhangings manufacturers, are well represented by some very novel artistic designs. Messrs. F. Jones & Co., patentees of the silicate cotton, show its various applications as a fire preventative. Messrs. Thos. Baillie & Co. exhibit translucent enamelled glass, particulars of which we will reserve for a special notice. Messrs. Cameron, Amberg & Co., of London, have an excellent variety of their patent system of cabinet letter-files, &c. Messrs. King & Smith, Weedon, Northamptonshire, are *en evidence* with their well-known patent honeycomb wine-bin, which possesses advantages so obvious as to command success. That excellent stove, the "Nautilus," the patent of Mr. J. B. Petter, of Yeovil, is shown in different sizes. The mail-clad stove, adapted for churches, &c., is coated with mail, which retains the heat longer and distributes it more evenly. This is a recent patent of Mr. Petter's, and promises to be as well known as the "Nautilus."

# PRIVATE TURKISH BATH, WOLVERHAMPTON.

THE plan and description of Mr. S. T. Mander's private Turkish bath at Wightwick Manor, Wolverhampton, Messrs. Grayson & Ould, architects, Liverpool, will be of interest to many of our readers. The building, which is of brick, consists of three rooms—two hot-rooms and a cooling-room. The centre one answers as "tepidarium" and shampooing-room. Three rooms are sufficient, and answer all purposes for a private bath. The cavity in the walls is made use of for ventilating the bath, and is useful as a non-conductor from the colder air outside. The inside walls are of glazed bricks in various colours, designed in good taste. These walls form the best surface for hot-rooms; they are easily washed. The ceilings

are concrete, and the floor neatly tiled. The bath is effectually heated by Messrs. J. Constantine & Son's (Manchester) convoluted stove. The size of warm-air flue is 2 feet 9 inches.



The air to be heated is drawn from outside through flues of equal dimensions. With such provision for ventilation a rapid and constant change of air takes place, and all vitiated air and

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"In my estimation Sharpe's Pattern, known as the 'Flushing Rim' is the best."—*Building News*, December 23, 1881, page 822. Also PRACTICAL NOTES ON PLUMBING, by F. J. DAVIES, Esq., H.M., A.S.P., &c.



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the effluvia thrown off by the bather is speedily carried away, and one of the chief desiderata of bathers secured much to their satisfaction. The English people are supposed to be rather slow to change habits or adopt those of other nations; but we seem to have jumped at and taken to the Turkish bath in a remarkably short time. We have not only taken to the system, but have used it freely, and we may take credit for having materially improved it in construction, and also developed a system of heating and ventilating it, which, based on sound scientific principles, can be relied upon to act with certainty.

#### THE INFLUENCE OF SUNLIGHT ON TREES.

IN the latest report of the head of the Forestry Department of the United States reference is made to the effect of light on the growth of various trees. It is well known, says Professor Fernow, that light is necessary for the development of chlorophyll, and, therefore, for the life of all green plants, and especially for that of trees. The heat alone which accompanies the light is not sufficient, although the relative influence of the light and the heat on the growth is still an open question, as well as the relative requirements in light of different species of trees. In the case of forest weeds, which in forestry serve as an indication of the amount of shade which the trees exert, and with that their capacity of impeding evaporation, some require full sunlight for their development, others are averse to a high degree of light. To this must be due the change in the plants of a district when its forests are removed. Then the amount of light or shade needed is modified by site. Where the sunlight is strong, in higher altitudes, drier climates, or where the growing season is longer, or there are more sunny days, some species will endure more shade. The flora of high altitudes in general requires light. Trees nearly always develop best, in other words make most wood, in the full enjoyment of light, but their capacity of developing under shade varies greatly. The yew will thrive in the densest shade, while a few years overtopping kills the larch; the beech will grow with considerable energy under partial shade, where the oak would only just keep alive, and the birch would die. When planted in moist places all species are less sensitive to the withdrawal of light. In the open, maples, elms, sycamores, and others grow well and make good shade trees; in a dense forest they thin-out and have but scanty foliage. Conifers,

such as spruces and firs, which preserve the foliage of several years, have perhaps the greatest capacity of growing under shade, and preserving their foliage in spite of the withdrawal of light. In America sufficient data to group the forest trees according to the amount of light required by them have not yet been collected, but rules based on experience have long been formed in Germany, where the behaviour of trees under different conditions of light has been carefully studied. It has been found, for instance, that on the same branch those leaves which are developed under the full influence of sunlight are not only larger and often tougher in texture and thicker, but that they have a larger number of stomata or breathing pores than those less exposed to light. The whole subject is one of the utmost importance in forestry, and observations and experiments are to be carried out in regard to it in the United States.

#### REGISTRATION OF PLUMBERS.

ON occasion of the opening of the New College, Newcastle-on-Tyne, by the Princess Louise, an inspection was made of the specimens of work by apprenticed plumbers. Mr. George Robson and Mr. T. S. Brown were presented to the Princess. The Master of the Plumbers Company, Mr. W. H. Bishop, explained to her Royal Highness the work which the company was undertaking in connection with the technical education of plumbers. Relative to the Worshipful Company of Plumbers and the special work in which it is engaged, he said the interest is owing to the survival of the principle of its laws, which date from its ordinances, Edward III., which virtually guide the action of the present company. The ordinances required that the skilled men of the craft should give close attention to the young men entering it, and that their ability should be duly certified. The only satisfactory security is that attaching to the employment of properly trained and certificated men. Efficient training is now dependent upon the system of technical education. The company is prominently identified with the practical development of that educational system by its co-operation in the formation of technical classes, where its principles and the practice of the trade were taught. The master desires by his presence to represent the union effected by the use of a common system between the plumbers of the north of England, the chief educational establishment of the district, the Durham College of Science, and the company

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Having received complaints alleging the failure in certain cases of the Self-acting Air-Pump Ventilator, upon examination being made it was found in every instance that the Contractor had substituted, to secure a greater profit to himself, a cheap and inferior Ventilator resembling in outward appearance the Self-acting Air-Pump Ventilator, which had been specified to be used.

In one case, a Workhouse, as many as Forty Ventilators were found to have thus been fraudulently substituted, and which had to be replaced at the Contractor's cost by the Air-Pump Ventilator.

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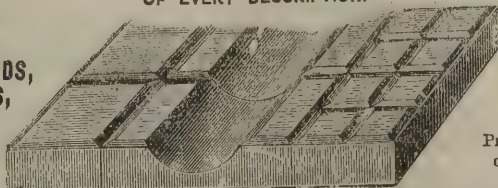
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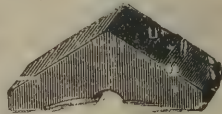
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whose centuries of existence are as full of tradition as they are of promise for the future. The development of the system will increase the demand for technical classes, therefore the opening of the College is happy in time as in other circumstances. The Corporations of Newcastle and Gateshead, as well as the plumbers of those towns, were among the first supporters of the movement for the registration of competent plumbers; and by the joint action of those bodies practical classes have been carried on during the past two years under the personal direction of a committee of plumbers and the gifted principal of the college. In historical interest this present occasion is exactly 200 years subsequent to the date of the coat-of-arms granted to the company in 1588 by Queen Elizabeth. Your Royal Highness will see the coat of arms in this frame, and there is a peculiar tie existing on this occasion, as the Recorder of Newcastle, W. Digby Seymour, Q.C., is one of the Wardens of the Worshipful Company of Plumbers, and upon his motion many of its most important steps have been taken.

### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

- 15398. Henry George Planner, for "A disinfecting apparatus for waterclosets, urinals, drains, &c." October 26, 1888.
- 15420. Frederick Lamacraft, for "The self-hanging and fastening and easily removable window-sashes." October 26, 1888.
- 15441. Frederick Ransome, for "Improvements in furnaces for burning cement and like materials." October 26, 1888.
- 15461. David Burns and James Blyth Cairns, for "Improvements in apparatus for regulating and fixing fanlights, ventilators, casements, mirrors, and other articles of furniture moving on pivots or hinges." October 27, 1888.
- 15478. August Wittgeroth, for "Improvements in heating and ventilating apparatus." (Complete specification.) October 27, 1888.
- 15503. William Cussans, for "An improved safety bolt or

fastener for windows, doors, casements, &c." October 27, 1888.

15505. Joseph Harrison and John Edward Linsey, for "Improvements in drawing pens." October 27, 1888.

15568. Benjamin Richardson and Edward Dickinson, for "Improvements in guards for brickmaking machines." October 29, 1888.

15583. John Herbert Bewick, for "A draught or dust-stopper for the top and bottom of house-doors." October 30, 1888.

15586. Robert Bearpark Lyon, for "A machine for moulding bricks." October 30, 1888.

15601. Charles James Harcourt, for "Improvements in the manufacture of electric bell-push fittings." October 30, 1888.

15610. John Rothwell, for "A new or improved apparatus for ventilating and other purposes." October 30, 1888.

15620. William Phillips Thompson, for "Improvements in or relating to cocks, valves, taps, and the like." (Jean Cortella, Belgium.) October 30, 1888.

15650. Alfred James Clark, for "Improvements in fire-grates and stoves." October 30, 1888.

15668. William Smith, for "Improvements in, or connected with, wood-planing machines." October 31, 1888.

15725. Samuel Worsencroft, for "An improvement in cowls or ventilators." November 1, 1888.

15745. John Porter, for "Improvements in contrivances for effecting the escapement of smoke and preventing draughts in chimneys." November 1, 1888.

15754. Catherine Hubbocks, for "A drawing square, called the 'Paragon Square.'" November 1, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

12489. William Robert Gunn, for "An improved automatic arrangement for preventing draught and dust entering under or at the top of doors." August 30, 1888.

12491. Alfred Maconochie, for "An improved sheet or covering for water or other closets." August 30, 1888.

12540. John Mason, for "Improvements in skylights, ventilators and sidelights, by means of reversible weather bars." August 31, 1888.

13319. Arthur Greg (of the firm of James Chadwick & Brother), for "A new or improved self-acting machine for sawing timber and the like." September 15, 1888.

13393. Richard Hocking, for "Improved self-flushing apparatus for cleansing privies, sewers, and drains." September 17, 1888.

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13448. Archibald Caldwell, for "Improvements in apparatus for controlling or regulating the flow of water or liquids in dwelling-houses, factories and other buildings." September 18, 1888.

13451. Henry Charles Risborough Sharman, for "Improved window sash-fasteners." September 19, 1888.

13540. Samuel de la Grange Williams, for "New or improved burners for heating lime-kilns, brick-kilns, and other kilns, by the combustion of gas and other like purposes." September 19, 1888.

13605. Henry Perceval Monckton, for "A combined movable and adjustable lavatory basin and bath." September 20, 1888.

13700. Robert Middleton, for "An improved mode of securing windows, shutters, doors, and the like, such as slide in grooves, and appliances connected therewith." September 22, 1888.

13743. John Howie, for "Improvements in water-closet basins." September 24, 1888.

13839. William Dickson and Robert Burns Barr, for "Improvements in stoves and cooking-ranges." September 25, 1888.

13844. George Samson, for "Improvements in and relating to boxes or vessels for lowering and depositing concrete and such-like material for the foundations of sea-walls, or breakwaters, or other harbour or dock works." September 25, 1888.

14138. Henry Vincent White, for "Repairing and forming the surface of roads and streets." October 2, 1888.

14286. John Wilmer Ransome, for "Improvements in the manufacture of artificial stone and concrete blocks." October 4, 1888.

14422. John William Bernard Wright, of the firm of Wright & Butler, for "Improvements in the construction of stoves and tile-hearths for stoves." October 8, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

14184. James George Waters Fairbairn and Robert Jones, for "Improvements in the construction of fasteners to secure doors and windows." October 19, 1887.

16814. George Frederick Parkinson and George Charles Wickham, for "Improvements in syphon-flushing tanks or cisterns." December 7, 1887.

16891. Edward William Ives, for "Improvements in bridges, part or parts of which are also applicable for caissons for closing or opening entrances to docks or in other analogous positions." December 8, 1887.

17733. Joseph Breeden, for "Improvements in apparatus for flushing water-closets and urinals, and for other like purposes, and for regulating the supply of water for flushing." December 24, 1887.

17919. Daniel Sutcliffe Heys, for "Improvements in the shape of balancing weights, for balancing windows, doors, shutters." December 30, 1887.

1062. George Francis Verini, for "Improvements in or appertaining to chimneypots and other exit terminals for chimneys, ventilating shafts, and the like." January 24, 1888.

6143. Edward Albert Davies, for "Improvements in or relating to the manufacture and construction of galvanised cisterns and tanks." April 25, 1888.

#### PATENTS SEALED, NOVEMBER 2, 1888.

12379. James Duckett and Alfred Duckett, for "Improvements in and relating to water-closets using waste or slop water." September 13, 1887.

13180. John Hargreaves, for "Improvements in the manufacture of cement." September 29, 1887.

13193. John Martin Stanley and Thomas Blakemoor Stanley, for "Improvements in the structural means for extinguishing and preventing the spread of fires in theatres and other buildings." September 29, 1887.

14098. David Hall and Archibald Hall, for "Improvements in stone-sawing machinery." October 18, 1887.

14431. John Walter Gibbs, for "Improvements in exit ventilators for rooms and other places where down-draughts are to be avoided and noiselessness is a desideratum." October 24, 1888.

7815. John Knight Champion, for "Lock bricks." May 29, 1888.

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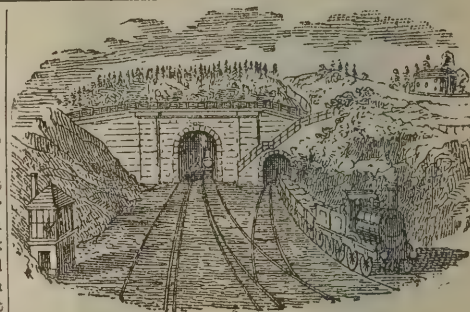
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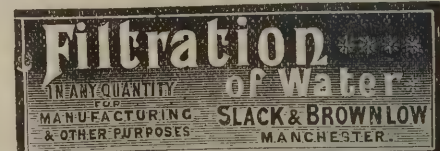
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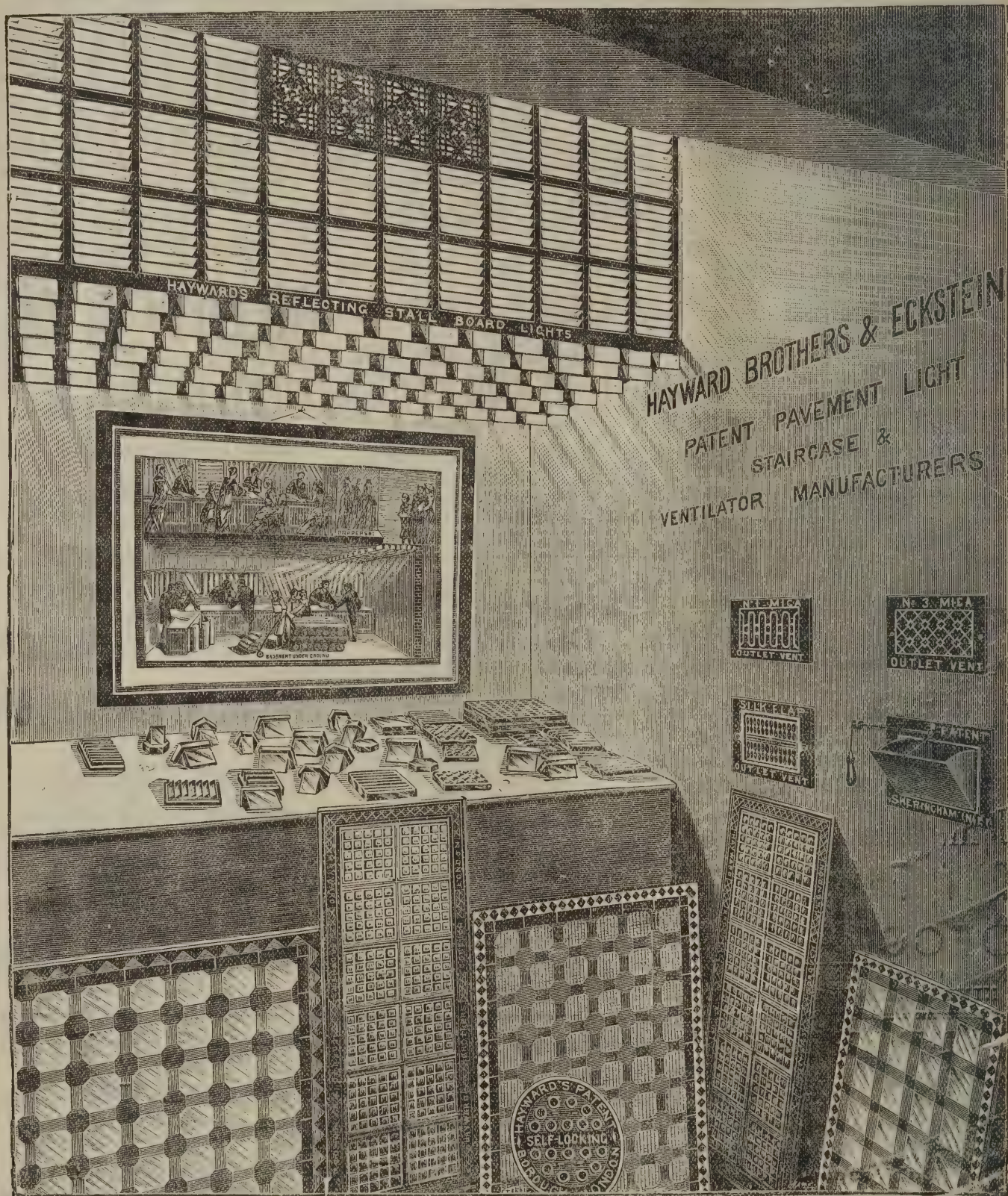
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 Friday, November 9, 1888.



# The Architect.

## THE WEEK.

THE depth of the gratitude towards architects who have helped to bring about success was displayed in the ceremony at the closing of the Glasgow Exhibition on Monday. The President appeared to be generous in recognising all quarters from whence help came, but not a word was said about the man who designed the building in a way that enabled every object to appear in the most satisfactory manner, and who did not live to see the final triumph of the Exhibition for which he so loyally laboured. Nor were the exhibitors more grateful. We hope atonement may be offered by founding a professorship of architecture in Glasgow out of the weighty surplus, estimated at 40,000*l.* The receipts for admission amounted to 118,938*l.* 9*s.* In addition, the season tickets brought 43,716*l.* 4*s.* 6*d.*, making a total of 162,654*l.* 13*s.* 6*d.* The number of people who passed through the turnstiles was 5,748,379, being in excess of the Colonial Exhibition, which was 5,550,749, and of the Manchester Exhibition, which was 4,765,137.

A RULE ought to be made by architectural societies prohibiting the delivery of an address at a conversazione. The galleries of the Arts and Crafts Exhibition were used as a scene for a meeting of that kind on Tuesday by the Society of Architects; but when so much was to be seen, how could sufficient attention be given to Mr. SETH SMITH's address? With all its good sense, it helped to tantalise a great many who would have preferred to be elsewhere, although compelled by courtesy to serve as listeners. When the address was composed the place of delivery was probably unknown, otherwise there would be some relation between it and the contents of the Exhibition. The education of architects' pupils, compulsory examinations, improvements in construction, leaseholds, the rise in the price of materials, are all very important topics, but they could be treated with equal benefit in a different place, without oppressing ladies with "shop." There is a great want of brightness about architectural assemblies, and the Society of Architects would do well to depart from the jog-trot mode of combining business and pleasure. LORD WINCHILSEA returned the compliment for the visit he received at Kirby Hall by proposing a vote of thanks to the President.

MR. JUSTICE GRANTHAM's decision, in the case of *HARDING v. Guardians of the City of London Union*, has settled the question of the right of a building owner to pay a quantity surveyor out of the money due to a builder. Henceforth it will be useless, under such circumstances, for a builder and his representatives to demand money so paid. In the case before the Court the Official Receiver in the bankruptcy of a builder sought to get back a sum of 52*l.* 7*s.*, which had been paid by the Guardians to a surveyor for his bills of quantities. The case was complicated by the builder making over his rights to a third party who laid claim to the money. Afterwards the Official Receiver was made plaintiff in the proceedings, but as the judgment was in favour of the Guardians the estate will have to bear the costs.

THE inquiry into the causes of the collapse of the houses in Great Titchfield Street is exciting much interest among architects, engineers, and builders. There is nothing remarkable about the buildings, and as there was no difficulty to be overcome, the accident is more mysterious. The walls were of brick, and appear to be of good quality, and, indeed, accidents can rarely be ascribed entirely to bricks. The strength and quality of the ironwork will obtain necessarily much attention before the coroner, and the evidence of experts will be required to satisfy the public. When the house fell in the Haymarket it was supposed by some experts that the ground beneath the foundations must have slipped or shifted. Whether a similar explanation can be offered in this case remains to be

seen. At present there is only one certainty, that the men who have most at stake in the issue of the inquiry are in the dark about the cause of the collapse.

THE Society of Arts has never put forth a better programme than the one for the coming session. The meetings commence on the 28th inst., and for the first the Society has been fortunate in securing Colonel GOURAUD to explain the new phonograph, about which everybody is talking. At the second meeting the no less interesting "Graphophone" will be the subject. "Explosives" and "Standards of Light" will be the subjects of the remaining lectures before Christmas. Among the lectures for next year will be the following:—"Manufacture of Sèvres Porcelain," by M. GARNIER, of the Sèvres factory, and one of the authors of the South Kensington Handbook on French pottery. Mr. B. BAKER will describe the Forth Bridge, of which he is one of the engineers; and Colonel HOZIER's paper will give a chance to discuss the *pros* and *cons* of the Channel Tunnel. The meetings of the Applied Art Section will not begin until January 22. The Cantor lectures will consist of six courses. Captain ABNEY will take "Light and Colour"; Mr. A. S. COLE, "Egyptian Tapestry"; Mr. WALTER CRANE, "The Decoration and Illustration of Books"; Mr. W. J. LINTON, who at one time held the first place in his art, will lecture on "Wood Engraving." The scientific subjects treated will be "Instruments for the Measurement of Heat," by Mr. C. V. BOYS, and "Heat Engines," by Mr. GRAHAM HARRIS.

A MEETING of the Royal Scottish Academy was held on Wednesday, when Mr. GEORGE OGILVIE REID (Edinburgh), Mr. THOMAS SCOTT (Edinburgh), and Mr. JAMES GUTHRIE (Glasgow) were elected Associates of the Academy.

LORD ARMSTRONG has shown his interest in the Benevolent Fund of the Institution of Civil Engineers by offering to contribute any sum not exceeding 5,000*l.*, provided the members will raise a similar amount. It is to be regretted that nobody is in a position to render a corresponding service to the Architects' Benevolent Society.

It is intended to amalgamate the various architectural societies of the United States with the New York Society known as the American Institute of Architects, each, however, preserving its independence. There are to be three great sections comprising all the States, and these are to be divided into State Associations, or chapters, which may be subdivided into lodges, according to circumstances. All divisions and subdivisions are to be free to make laws and regulations for their own government, excepting only that the standard of admission to membership must be at least as high as that fixed by the constitution of the Institute.

DURING the reign of the late Emperor of the FRENCH there were only two salons in Paris where men of letters were likely to be met. One belonged to the Princess MATHILDE, to whom arts and letters were indebted in those days; and over the second, which was in a wonderful house in the Champs Elysées, "LA PAÏVA" presided. There was jealousy between the two patronesses, and it is upon record that on one occasion the Princess expressed her anger openly, when it was said that M. HÉBERT accepted a commission from the "drôlesse," who believed that everything was gainable by a strong will, and that failures could be settled by an overdose of chloroform. The PAÏVA mansion did not display refined taste, but in furnishing and decoration it was the most expensive in all Paris. Everything was heavy and ostentatious. Some of the best painters in Paris gave their help to make the walls and ceilings a town talk. The salon and smoking-room were undertaken by M. LOUIS REY, and the former became a "vision of fair women," with LA PAÏVA as a sort of climax. PAUL BAUDRY undertook the ceiling, and represented VENUS looking down on her worshippers. M. LOUIS REY has just died in Paris, and the mention of his name will recall the strange story of the house where was his principal work. He painted several buildings in addition, but of late years his style was out of fashion.



## THE ARTS AND CRAFTS EXHIBITION.—II.

THE first work which will obtain the attention of the visitor in the Exhibition is likely to be the "Brass and copper fountain" designed by Mr. BENSON. That copper is coming into fashion will be evident from the windows of the large ironmongers' shops in London. There is no reason why it should not be utilised for part of a fountain. Mr. BENSON has adopted a form that is simple—a basin with good mouldings, and without any of the heaviness which is common with fountains. It would be well adapted for a hall. The parts of the large iron gates, by Messrs. ROBINSON & ROBSON, which are most successful are the constructive pieces, the curved lines being graceful. The larger leaves are stiff and characterless, whilst the roses in the central openings appear unconnected with the general design. In the font cover carved by Mr. KNOX from a design by Mr. SOMERS CLARKE, the error is avoided of giving detail in the crockets, and the figures in the interior forming a complex group are well rendered. A drawing and a panel of the pulpit in St. Martin's Church, Brighton, designed by Mr. CLARKE and Mr. MICKLETHWAITE, suggest an important work which recalls the Sakramentshäuschen of Nuremberg. The two works represent Gothic art in the Exhibition, and somehow the contrast offered by them to the remainder of the objects suggests that Mediævalism and freedom have little in common.

If there are manufacturers who conceal the existence of the men who aid them, it cannot be said that the practice is general. Of late years several firms appear to consider that one of the best ways of success is to announce the names of their designers. Messrs. MINTON have three cases of pottery, with about thirty examples, on a scale which admits of delicacy of touch, and anyone who is curious can see the names of the artists who painted or decorated the vases and plates. French influence is visible, and the collection would sustain a comparison with the best French work. Every specimen merits attention. The *pâte sur pâte* of A. MORGAN, as seen in No. 346, the Parian ewer, No. 358, and the china vases by JESSIE POPE, the dessert-plates by L. BIRKS, the vases by A. BOULLEMIER, may be cited as especially successful. The *Amazon*, by HENRY ASTON, is a well-known statuette, one of the many compositions derived from the group of KISS. M. SOLON's name is associated with the firm, but he has before now surpassed his two slabs. Can anyone suppose that it would be possible to produce pottery of the class shown in the three cases without the resources which can only be found in an establishment like Messrs. MINTON'S? In other trades there is a similar necessity for an organisation on a large scale, if even small works are to be satisfactory. That being so, it seems unwise to induce men to imagine that they can be successful if they work single-handed. Messrs. MINTON, and the other manufacturers who exhibit, are representatives of "the modern industrial system" which is so obnoxious to the Arts and Crafts Society, yet such work as theirs is obtainable in no other way. Tiles and some lustre pottery are the works which Messrs. MAW & Co. exhibit, and they also need the modern industrial system. The designer has an important share in their preparation, but much depends on men who must remain unrecorded in catalogues. Nine or ten designers' work is to be seen in Messrs. MAW'S stands, and there is a variety of styles. Mr. WALTER CRANE has tiles with figure subjects, which are as simple in design as if the drawings were intended to illustrate a child's book, and the treatment corresponds with the subject. Mr. DAY is elaborate, but recognises the virtue of flatness. Mr. TEMPLE, Mr. JOHNSON, Mr. LODGE, and others, represent different styles, for whatever may be the defects of the manufacturing system, a lack of variety is not one of them.

The formation of a company to work the "cloisonné mosaic" is evidence of the necessity of the co-operation of many if some kinds of work are to be developed. The large jars which are covered with the material are rather commonplace in form, and it would be easier to obtain better patterns; but there can be no question of the excellence of the new cloisonné mosaic, or of its applicability to curved as well as to flat surfaces. It appears in the Exhibition in several forms. An example of "opus sectile

and mosaic"—a figure of *St. Gabriel*, with pink wings designed by Mr. J. W. BROWN, and exhibited by Messrs. POWELL & SONS—is very brilliant in colour, and the execution is adapted for a panel that will be fixed close to the eye.

There are many examples of metalwork in the entrance hall. The most important, according to the money standard, is the waist-belt of wrought gold, designed by Mr. CARTER for Messrs. HUNT & ROSKELL. It consists of a series of panels filled with a number of small figures in relief; but the artist seems to have had some old engravings before him when designing them. At first sight the belt would not be taken for an original, and to some that quality will be its highest praise. The two nude figures of women which form the handles of Mr. SIMONDS'S "loving cup" are well-modelled; but surely it is false art to introduce the figure in that way. Again, what connection can exist between them with the serpents which retain them with a feast? The "dance name and number holder," by Mr. REYNOLDS-STEPHENS, with figures in low relief—a Greek boy playing while a girl dances—is evidence of what can be made out of a commonplace thing by an artist. Many ambitious pieces of sculpture in relief have less spirit than this small plate of metal. Delicate work of an ornamental kind will be found in finger-plates and lock furniture by Mr. T. R. SPENCE, who displays versatility as well as skill in designing for works in different materials. The Toynbee Hall School and Guild of Handicraft send several examples of *repoussé* brass, some of them rather ambitious in design. It is only a master who should attempt to represent the features of a face by the process. Mr. WALTER CRANE is an able artist, but he completely failed when, in No. 295, he attempted to represent the face of PHŒBUS. In the dish, which is ornamented with fish, he is successful, and the work suggests the limitations for men who are less expert. The specimens by Mr. STEBBINGS, of Renaissance ornament, have more freedom of treatment than the majority of the experiments in *repoussé*. In wrought-iron the bracket for gas and the large bracket for lamps of floral type, designed by Mr. SEDDING, take first place. It is gratifying to find a piece of work which does not depend upon spirals for its effect. The altar cross, by the same designer, is of plain brass, the arms and top ending in crowns. Messrs. GODFREY & SON'S brasswork, if original, has at least the characteristics of German work. Messrs. ELGOOD introduce the artichoke for the decoration of one of their *repoussé* plates, which is novel. There are several lamps in brass and copper. Mr. CRANE, it is needless to say, has one, and another is by Mr. HARDY.

The copy in tapestry of Mr. BONE'S design, *Alfred in the Danish Camp*, will suggest that the failure of the Windsor Tapestry Works did not arise from defects in the weaving. The original is closely followed (the hands, as is not uncommon, being the weak parts), and the colours are kept low. The care of the workmen is unquestionable. Many fine pieces of embroidery are in the hall. The border of an alb in Limerick lace, although only on a net body, is interesting; but the wonderful cherubs' heads recall Mr. RUSKIN'S description of the Irish scribe who contrived to leave out the mouth when he was drawing a face. Here, we suppose, the lines are intended for a mouth, but they are in the wrong place. No one will wonder at divagations among the lace-makers, since they are under the instruction of the South Kensington authorities, who take a good deal of credit for their success.

The next gallery contains examples of pottery, wall-papers, embroidery, furniture, and bookbinding. Mr. DE MORGAN has not had before such an opportunity for the display of his successes as a potter. A chimney-piece designed by Mr. RICARDO serves not only as a support for vases and plates, but also allows the tiles to be shown around the grate and as a hearth. Mr. DE MORGAN'S success was at first in his lustres, but now his skill is seen in most branches of the potter's art. The large framed panel of tiles stretching from ground to ceiling, in which a symmetrical arrangement of peacocks is the chief feature, would be considered a *chef-d'œuvre* by the Persians. The big vase is a fine piece of throwing, but the handles might have been copied from an example in metal. When it is remembered that Mr. DE MORGAN'S experiments began a few years ago, his collection is most remarkable, and



should be a lesson to people who are fainthearted about the prospects of industrialism.

The committee of the Exhibition announce "that some leading firms in the supply of decoration have shown no disposition to exhibit under the condition that the names of the actual executants of any work shall be published." From an accusation of that kind Messrs. WOOLLAMS & Co. and Messrs. JEFFREY & Co. are free. Both firms give prominence to the names of their designers, and endeavour to associate them with the titles given to the patterns. The specimens shown in the Exhibition exemplify the perfection which is now reached in wall-papers, owing to the liberality of the manufacturers and the emulation which must arise when several artists are engaged in a common purpose. It can be said without exaggeration that out of England it would be impossible to see equal merit in this class of work. If, therefore, the industrial system can be successful and satisfactory to artists as it is carried out by Messrs. JEFFREYS and Messrs. WOOLLAMS, may it not be equally successful whenever similar enterprise and love of art are brought together?

Near the papers are pieces of cretonnes, designed by Mr. DAY, in simple patterns that are suggestive of brushwork. A cotton hanging with birds, designed by Mr. LATTIMER, is clever and inexpensive. Mr. WARDLE has several textiles in cretonnes, silks, velvets, &c., but chief among this class of work is the silk damask exhibited by Messrs. MORRIS & Co. The patterns by Mr. WILLIAM MORRIS have the largeness of style that is seen in Venetian work, and are very different from the "sprigs" and stripes which are supposed to be most suitable for textiles of all kinds. They illustrate Mr. MORRIS's principle, that large patterns if properly designed are more restful to the eye than small ones. The Arras tapestry is also successful, and the design, *The Wise Men's Offering*, by Mr. BURNE-JONES, for reproduction, is worth notice as a new version of the event. It must be said that the furniture is not the most satisfactory part of Messrs. MORRIS's collection. There is no fault apparent in the workmanship, but the designer would seem to have been hampered in his efforts at novelty by the necessity of preserving an eighteenth-century character for the pieces.

The examples of bookbinding are interesting. The Celtic ornament which Mr. COFFEY introduces on the covers of the two volumes of FERGUSSON's poems are appropriate, and well arranged, but what fitness can the ornament have for a book containing Sir JOHN MILLAIS's attempts to illustrate the Parables? Mr. MOYR SMITH makes a very pleasing cover by depending mainly on gilt lines, and it is the only example of the artist's work in the Exhibition. ROSSETTI's plan of massing gold ornament on a part of the cover has been followed by Mr. DAY. But it is useless to expend much trouble on cloth covers, when the material itself not only fades, but through the chemical covering acts upon the gilding. Any of the books published by CHARLES KNIGHT, which were the first to be covered with cloth, still keep their colour, while modern books after a year or two become shabby. One case contains several illuminated manuscripts in which Mr. MORRIS, Mr. BURNE-JONES, and other artists, exemplify the advantages of a division of labour in a manner that would gratify the most rigid opponents of the principle.

This gallery is rich in decorative needlework, but as a rule the designs are supplied to the ladies. If that sort of decoration is needed, we need not go abroad to find a supply. Shops are now displaying gaudy Japanese embroidery in screens and hangings which, to the majority of people, are perfection. Happily there is no sign of imitation of the fashion in the needlework of the Exhibition.

The Century Guild of Artists furnish a variety of their works in metal, wood, painting, &c., to this gallery. The cottage piano, designed by Mr. MACKMURDO, of which the back is visible, is a departure from the cumbersome model so esteemed throughout the world. The stencilling designed by Mr. A. HEATON is also worth imitation. The photographs and drawings of metalwork at Haileybury College, by Mr. REGINALD BLOMFIELD, show an original sort of treatment, and equal vigour and spirit can be seen in the grate, lantern, and other works, by the architect, which are in the gallery. Metalwork needs the utmost attention in

England at the present time, for the Germans have taken it up with great energy.

The question of price is always suggested in an exhibition, but in this case it is better to be ignored. The patrons of the Society will not, we hope, ever ask whether it is possible to obtain equal perfection in form for less money. Everyone knows that individual handiwork is more expensive than what is produced by the combined action of hands and machinery. As regards price, a man can never hope to succeed in competition with a machine. A manufacturer who seeks to obtain the support of the public in the ordinary way need not therefore feel any jealousy when he visits the Exhibition, for he will at once recognise that the objects before him must be produced and purchased under conditions which cannot exist in his works or shop. He may even be doubtful whether many of the exhibits were not produced solely for the gratification of the "craftsmen," and without any thought of sale.

But if questions of price are not to be considered, we may at least be allowed to ask (assuming, for the moment, that the makers are genuine representatives of trade in every case) whether the Exhibition realises what is, or rather was, meant by craftsmanship? The artificers who lived long ago, and to whom we apply the title of craftsmen, were expected to be competent to design the things which were to be made by their own hands, with the aid of their assistants and apprentices. It was the creation in the mind before the material was taken in hand which distinguished the craftsman from the mechanic:—

Den schlechten Mann muss man verachten,  
Der nie bedacht, was er vollbringt.  
Das ist's ja, was den Menschen zieret,  
Und dazu ward ihm der Verstand,  
Dass er im innern Herzen spüret,  
Was er erschafft mit seiner Hand.

To be received as a member of a craft, it was necessary for a candidate to produce a piece of work which was entirely his own. He was not given a drawing and told to follow it, as would be the case now in so many trades. Occasionally a painter or a sculptor might supply a design for a work in gold or silver; but, as a rule, each craft tried to be independent of external help. Indeed, the jealousy of trades would be an obstacle to much co-operation between them. The limits for action were prescribed by law, and it is known that a sculptor was not allowed to meddle with the constructive part of a work, such as a tabernacle or an altar in a church, for which he obtained a commission, but was restricted to the ornamentation. If, therefore, the existing system of production is to be abandoned, why should we not return to the practice of the veritable craftsmen? There are no precedents of any account which justify such a combination of artist and workman as is seen in the Exhibition now held in Regent Street. It is a departure from the old ways in common with division of labour, of which, indeed, it is an example. If the workman is not his own designer, what security can we have that he is satisfied with his work? Where is the chance for any individuality with such precise drawings as those which are seen in the Exhibition, and which in some cases appear to be displayed in order to show the fidelity of the copy, and therefore to assert the claims of the designer for the credit of the work? There is no difficulty with drawings of that class in obtaining copies by means of division of labour and machinery, and he would be a brave man who would say they had less correspondence with the design than the copies made solely by hand. The fact is this reform, like all which preceded it, bears the stamp of the reformers. It is a project of artists who are not craftsmen, rather than of craftsmen who are artists. It can be taken as no more than an intermediate step in the movement. If we must have craftsmen, it will be impossible to withhold the power of creation from them. Mere copying, such as is seen throughout the Exhibition, can be as well done under the present system. If, therefore, the artists of the Society are eager to bring about a revival of craftsmanship, they will have to be self-sacrificing, and enable the workman to be independent of designers, if they cannot emancipate him from the capitalists. If, however, the Exhibition simply represents an agreeable co-operation between artists and amateur metal-workers, carvers, embroiderers, &c., it is not then necessary to go back to the practice of the veritable craftsmen.



## THE ARCHITECTURAL ASSOCIATION.

A PAPER on "Victoria and Elizabeth" was read by Mr. J. A. Gotch at the last meeting of the Association, as follows:—

In traversing this beautiful country of England with a view to examine its architectural remains, the two objects that we look for wherever we go are the Gothic church and the Elizabethan manor-house. I am not altogether sure, indeed, that with many of us the Elizabethan manor-house does not attract more attention than the Gothic church. How far this would have pleased or shocked our fathers in the profession it would be useless to inquire. Fashion sways our clients as it sways the hatter's customers. These will accept a wider or a narrower brim even as they are persuaded thereto by the young man behind the counter, and as his choice agrees with what they can recollect seeing in fashionable places. Those will accept a pointed or a round arch according to the dictum of their architect, so long as it is not at variance with what their neighbours are accepting on all sides. But each and all desire the cheapest of its kind, and are highly gratified at obtaining much show for little money.

Twenty or thirty years ago the pointed arch and its accompanying features were the only acceptable wares. Accordingly, to look at work less ancient than the thirteenth century was a grievous waste of time, not to say the mark of a dissolute mind. Now, however, the partakers of our annual excursion, though quite prepared to accord its full archaeological value to the thirteenth century, seek their inspiration for the nineteenth from work dating about half-way between the two, namely, from the times of Elizabeth and James. The reason of this is not far to seek. We are gradually awakening to the fact that forms and features which satisfied the equations that the Middle Ages had to solve do not satisfy those presented to us five or six centuries later. In ecclesiastical architecture, it is true, those forms and features are still not out of place. But ecclesiastical architecture is demanded by a select few. Domestic architecture is sought for by the million; and in the domestic architecture of Elizabeth and James is to be found much that offers clues and hints towards solving the problems of to-day. Apart from this practical reason for the change of taste, there is what we may call the historical reason. The sixteenth century marks sharply and decisively a complete change in men's habits of thought. With the Cecils and the Hattons, and the innumerable builders of mansions under Elizabeth, we have much in common; their ways are, many of them, our ways, and their thoughts our thoughts. But what have you and I to do with the celestial hierarchy that adorns the west front of Wells Cathedral, or with St. Edmund, king and martyr, whose severed head was miraculously joined to his body after death, and whose corpse thus supernaturally "restored" was the sole and sufficient cause of the erection of the enormous Abbey at Bury St. Edmunds? Or what with the sacred thorn that for centuries was the mainstay and support of the magnificent Abbey of Glastonbury? You and I, at any rate, are architects, and we love to know of these things, and some of us from loving to know of them come to love the things themselves, and even perhaps to feel towards the celestial hierarchy, and St. Edmund king and martyr, and the sacred thorn, some of the reverence which filled the minds of men six centuries ago. But then we are architects, and our sympathies are largely with the past. How is it with the pushing men of business with whom the world is peopled? Like Gallio, they care for none of these things.

But they do care for comfortable homes, for handsome houses, for labour-saving appliances, and for all the conveniences which modern progress affords; and from their architects they expect, first of all, these material things, and they sympathise but little with any desire that their architects may have to work in some particular style which prevailed when the fortress still left its trace upon the dwelling-house, when security was preferred to light and cleanliness, and when the quantity of the meat was of more importance than the quality of the cooking or the convenience in cooking it. It is not surprising, therefore, that the taste for Gothic houses was shortlived. Their pointed windows, however successful on the outside, were failures on the inside, obstructing the light where it was most wanted, and putting the upholsterer at his wit's end how to fix his blinds and curtains. Their wide-open fires were liable to smoke, were costly to feed, and warmed the chimneys where the family did not sit, in preference to the rooms where they did. The stained and varnished woodwork and the indecorous display of naked construction produced a feeling of chilliness and discomfort. After all, the most blameless life will not bear to have the whole of its motives exposed; the most beautiful bones are better for a covering of flesh. And so the desire for bare Gothic declined, and attention was diverted, with better prospect of success, to the great house-building epoch of Elizabeth. That period and the one in which we ourselves live are unrivalled for the amount of building which marks them. The building trade at the present time is one of

the largest interests in the country. The ever-increasing numbers of our own Association are themselves a proof of the amount of work that is being done in bricks and mortar. The innumerable illustrations which appear week by week in our excellent building journals, faintly suggest the amount and the variety of the work undertaken by the architects of Victoria's time. But we have to go back to Elizabeth's days to find anything like the same amount of general activity, though even then it was but as a placid lake compared to the stormy ocean. There was, however, hardly a squire then who did not either rebuild his house or materially modify it, while most of the nobles and nearly all the high functionaries of the Court erected mansions which to this day are, such as remain to us, models of stately design and magnificent taste.

To name only a few. There was the great Lord Burghley, who built Burghley House and Theobalds; there was Sir Christopher Hatton, who built Holdenby and enlarged Kirby; the Earl of Dorset, Lord High Treasurer, who built Buckhurst; the Earl of Suffolk, another Lord Treasurer, who built Audley End; Lord Robert Cecil, who built Hatfield; Sir Thomas Heneage, Treasurer of the Queen's Chamber, who lived at Copt Hall; Sir Percival Hart, Chief Sewer and Knight Harbinger to Queen Elizabeth; Sir Thos. Lake; and Sir George Coppin, Clerk of the Crown to James I. Besides these, who were in some way attached to the Court, and probably made the money there which enabled them to erect such noble houses—which were always, in their letters to each other, built solely in order to entertain Her Majesty in a suitable manner; besides these there were great noblemen like the Duke of Buckingham, who built Burley-on-the-Hill, and wealthy gentlemen like Sir Francis Willoughby, who built Wollaton, and Sir Walter Covert, who built Slangham Place, in Sussex. These are only a few of the great building owners of the time, only a small selection from the army of clients who were willing to spend half their fortunes in obtaining houses with all the stately apartments and the conveniences which the change of manners then rendered necessary. These men it was who inaugurated a new era in architecture, whose habits led them to require a new type of dwelling, and whose tastes demanded magnificence and display. They are sharply marked off from their predecessors, who were content to lurk in dark places, if sufficiently strong, and it is because they were men of so much wider ideas that we find it worth while to study their houses closely to-day. But though Elizabeth's days are more suitable sources of inspiration to us than the earlier times of unalloyed Gothic, far be it from me to advocate blind copyism for the architect, or to recommend a client to build himself a house strictly after the fashion of those built—as Evelyn phrased it of Kirby in the middle of the seventeenth century—*à la moderne*. Not at all. Mere copyism is the resource of the feeble; but, on the other hand, there is every reason why we should profit by the ideas, the successes, and more especially the failures of those who have gone before us. And for that reason it seems to me that an examination of the work of Elizabeth's time in the light of these days of Victoria will not be out of place.

Now, to begin with, of all the thirteen houses which have just been named, how many have come down to us? Only Burghley and Kirby, Audley End and Hatfield and Wollaton. Theobalds is gone completely, and so are the houses of Sir Thomas Heneage, Sir Percival Hart, Sir Thomas Lake, and Sir George Coppin. Of Holdenby, little but the memory remains. Slangham Place is reduced to a few columns and arches, and the grass-grown foundations of its extensive walls. Burley-on-the-Hill has been replaced by a great Palladian structure. So far as we know, they have not been destroyed by fire, or by any hostile agency, but they have gone to decay because no one was found to preserve them. And what of those which have survived? Kirby has been deserted for more comfortable houses; Audley End has been shorn of two-thirds of its extent; Burghley and Hatfield and Wollaton retain little of their original arrangement beyond the shell. The dwellings which suited our forefathers of Elizabeth's time do not suit us in Victoria's.

It is the same wherever we go. If we find an Elizabethan house occupied, either some radical alteration has been made, to the detriment of the architectural harmony, or else the inhabitants put up with manifold inconveniences rather than disturb the ancient order of things, which has served many generations of their predecessors. One of the most obvious drawbacks of the Elizabethan plan is the number of thoroughfare rooms. Burghley House has been helped by building a corridor round the courtyard. At Canon's Ashby, for want of some such addition, you have, from a considerable number of bedrooms, the choice of two ways to get to the breakfast-room. One is through the drawing-room, and down the main staircase; the other is down a subsidiary staircase and across the open courtyard. At Kirby the same difficulty was present, and before that house can be inhabited again that difficulty must be surmounted. A corridor here would be ruin to the beauty of the courtyard; while to roof the courtyard in, and to exclude



the sunshine from playing amid the badges of the Staffords and the long lines of swelling fruit, and to prevent the shadows from creeping across the grey and golden walls, marking from day to day "Time's thievish progress to eternity"—this might make Kirby habitable, but it would be a Kirby with half its poetry gone.

The fact is, these large houses were built for entertaining guests rather than as homes for their owners. The long rows of small rooms arranged round a courtyard were separate groups of apartments, self-contained, and designed to accommodate visitors and their servants in the same way that each undergraduate has his separate establishment at college. One of these groups is designed to include a bedroom, a reception-room, a servants' room, and a room for "wood, coal, and privy." There were certain larger rooms where the guests assembled together, such as the hall or the gallery, and to reach these the courtyard probably had to be traversed, just as to-day it has to be traversed by undergraduates for the sacred ceremony of dining. But in Elizabeth's days people seem to have cared less for the weather than we do; though, as rain would wet as much then as it does now, the gay gallants must have grudged exposing their finery to a sharp shower; and if they did get damp there would have been amid the brilliant assembly much the same kind of stuffy odour as pervades in our own times an omnibus on a wet day.

In the present day our habits are different. We do not entertain on the same sumptuous scale; a separate suite of rooms for every guest is not expected; people like to get to their rooms under cover, and would as soon thank you to put them up at a neighbouring inn as to ask them to walk across a wet court in evening dress. We find in these days that it tends to the easier and better work of the house to get all the bedrooms upstairs and the reception-rooms on the ground floor. There would therefore be no room for Lord Burghley's commendation of Holdenby, in that it had so fine an ascent from the hall to the great chamber. One of the governing features of an Elizabethan house we entirely omit from our designs—the long gallery. Almost all the old ceremonial is gone. Along with the gorgeous dresses went the stately manners, and the necessity for the stage whereon to display stately manners and gorgeous dresses. We look for large and lofty rooms now, because in themselves they are handsome and imposing, and not because they are picturesque backgrounds to our noble selves. We seek for comfort, not pageantry. And for that reason we no longer hanker after brilliant processions from the hall to the great chamber, winding up the broad staircase, where rows of quaint animals in all the attenuation and lissomeness of thorough heraldic "condition" gaze proudly over the heads of the guests, unmindful of all but the sacred family arms which they support. Not at all: we care for nothing of this; we prefer going up in a lift.

But the smaller houses, such as were designed for Sir George Coppin, or Sir Percival Hart, or Sir Thomas Lake, in London, were much more compact, and were tolerably convenient. But it is obvious even in them that expense was but little studied. If there was less money to spend, the house was made smaller, but no pains seem to have been taken to contrive economical plans. All those ancient buildings must have cubed out at a terrible figure. Everybody concerned seems to have agreed that one of the first things to be secured was a handsome building. The idea of getting the house comfortable inside, and leaving the outside to take care of itself, with strict orders to spend no money on show, which is a not infrequent instruction to us, does not seem to have occurred to clients in those days. They were quite content to let the architect have his way, and he went on the principle of making his clients adapt their wants to his architecture, rather than that of adapting his architecture to their wants. There is no doubt that his method was the easiest, and produced the most stately buildings, but our way is the best, and it is for us to solve the problem how to combine attention to all modern requirements with a handling of materials that shall produce fine architecture. Our task is by far the more difficult, and the time given to do it is generally of the shortest; so let not these things be forgotten when critics abuse the architecture of the nineteenth century. The method of the Elizabethan architect was simple enough. He ascertained approximately the accommodation required by his client; he found that he wanted a certain type of house, and away he went. The plan, perhaps, worked out so that there was a room or two more than the number asked for. A very simple matter; he just labelled them "waste," and the client had to pay for their erection; and the client's grandchildren, probably, paid for their pulling down.

Symmetry was another great solvent of those days: it simplified matters wonderfully, since it was accepted by all alike as indispensable. There was no need to adjust the sizes of the rooms to their various purposes, or to study the best positions for the windows and fireplaces. A start was made probably with the hall and the adjacent rooms; the position of the kitchen in relation to these was usually carefully considered, provision was made for the longest possible gallery, and the

rest was left to take care of itself. If it did not happen to work out quite happily for the best arrangement of some of the rooms, if the doors and windows quarrelled with the fireplace, or if the larder found itself possessed of a great bay window, nobody minded, for symmetry demanded it, and this excuse satisfied everybody. In the present day it is otherwise. Not only do we have to be very careful how we plan our buildings—so that not only our client and his wife are satisfied, but also his ox and his ass, and everything that is his—but as every foot of material is reckoned up beforehand, we have to be particular not to put in too many of them. Our predecessors had a freer hand; the masses of masonry in some of their chimneys would almost suffice to concrete the whole of the foundations; and yet amid those masses are generally to be found very delightful cupboards, the absence of which is the despair of the modern housewife. The wasteful planning of those times, at all events, carried some compensation with it.

Then, again, the great question of sanitation had not yet arisen. To-day we are slaves of the soil-pipe. That unsightly talisman has to be hidden as far as may be; and in the effort to hide it we make the whole house revolve round the small apartment which it safeguards. Not so the architect of Elizabeth's days. He was lavish in his supply of such apartments. Generally each suite of rooms had one. If it could conveniently be placed next to an outer wall, it was. If not, any other place was suitable. Sometimes it led directly out of the winter parlour, sometimes it was in a passage, sometimes in the middle of the house. Sometimes, but not often, it projected from the side in a manner almost modern, but, as a rule, the situations chosen for it are truly astonishing; and it is a matter of wonder whether our ancestors had any noses to offend or any blood to poison.

It has already been pointed out that particular care was bestowed upon the position of the kitchen; indeed, this is done to the exclusion of the consideration whether the servants overlooked the precincts devoted more especially to the family. This is a factor which played no part in designing a house in Elizabeth's days. A room was a room, no matter what its destination. Its windows ranged with the others, and were as good; so that, to look at the house from the outside, it appeared equally imposing from all points of view. This does not suit modern views at all. They demand that the servants' department shall be quite separate from the family's; and, as money must be saved somewhere, it had better be in the servants' offices, which need not be nearly so expensively finished outside as the rest of the house. At once, therefore, we have a back to the house—a large part of the building which has to be subordinated to the rest, which must be differently treated. This necessity alone is a factor which widely divides our ways from those of Elizabeth's time.

So, too, in the treatment of the elevation. In the old days they thought nothing of putting in numberless sham windows. The most picturesque side of Cobham Hall is riddled with sham windows, put there for effect merely, glazed to resemble their *bond-fide* neighbours, but built up at the back from the time of their erection. At Kirby, too, on one side of the entrance are the noble windows of the lofty hall, 20 feet high or more; on the other are a like number of noble windows, 20 feet high or more, but a close inspection shows that a floor goes right across the middle of them. In so far as their noble height is concerned they are shams. We cannot do that now, nor anything like it. Nor need we be anxious to make our chimneys look like coupled columns, nor to set great heraldic creatures climbing about the stonework, nor to do many other of the things which our ancestors did, but which, being done, we do not wish to see undone. These things, from which our sober judgment revolts, we can avoid, and yet find much to help us in the manner in which stone and brick and wood were wrought in those days.

But who was responsible for these buildings? That is a question not yet satisfactorily settled. That there was anything like the autocratic and all-accomplished architect of our times I do not believe, who to-day designs his client a sideboard, to-morrow arranges his drains, and next week commences a stained-glass window to his memory. Things were much simpler in those days, and the various branches of the business of housebuilding were under the special care of separate men who may—indeed must—have been amenable to a central authority, but who certainly did not look to him for every morsel of design and instruction.

In the building of Cobham Hall, for instance, we find that one R. Williams, who was probably the clerk of the works, writes to Lord Cobham as follows:—"We have bargained with Giles de Whitt for making two chimneypieces for the two chambers next to your new chapel. He demands 65*l.* for both. I will not give above 50*l.*, and he will accept it in the end rather than fail." And later we find the same correspondent urging his lordship to "resolve what and how much you are pleased to have done by Giles de Whitt, either upon some new chimneypiece, or upon my lord your father's tomb, that the poor man have some work to get wherewithal to maintain and



sustain himself." No doubt Giles de Whitt designed these chimneypieces as well as made them, and, to judge from the different character of design in stone and plaster and wood, no doubt the masons designed their own carving and the plasterers their own ceilings and the joiners their own panelling, for the hand was not yet divorced from the mind. To read the letters relating to the building of Hatfield gives one the same impression. The only agents who appear are the clerk of the works and the foremen, or the surveyors who are sent down to ascertain in what state the buildings are, and why the cost so much exceeds the estimate. There is no architect mentioned, nor any one to whom all matters are referred, as they are in our days. The correspondence is carried on between the clerk of the works and the building owner, from whom instructions issue direct. Sometimes, however, a surveyor is employed to superintend, as was the case at Holdenby, for on one occasion when Lord Burghley was going thither and Sir Christopher Hatton was unable to receive him in person, the latter wrote a letter of welcome to his "singular good Lord, the Lord High Treasurer of England, at Holdenby," in which he begged his guest to give "his opinion to the surveyor of such lacks and faults as should appear to him in this rude building," which he averred was built "in direct observation" of Lord Burghley's house at Theobalds, and which he hoped might become really like it by means of Lord Burghley's corrections. How would an eminent architect in the present day like to have a high and mighty friend of his client's come down for the purpose of dictating alterations and corrections in a design practically completed? Perhaps, however, the request was merely a compliment on the part of Sir Christopher; at any rate Lord Burghley was charmed with Holdenby, praised its façade, ascent from the hall to the great chamber, and the largeness and lightness of the rooms. As for its being an imitation of Theobalds, truly the latter place he liked as his own, but it was only a foil to Holdenby. There was a certain amount of truth in this, for Holdenby was considerably larger, and was an improvement in many respects upon the older building. But they were both fine palaces. Holdenby, indeed, was a vast and stately edifice, suitable to an age which delighted in magnificent displays; and Sir Thomas Heneage declared it would hold the pre-eminence of all the modern houses he had known or heard of in England.

Most of the large houses of the time were thus superintended by a surveyor—or architect, as we should now call him—of whom the best known is John Thorpe. But his functions were far different from those that we have to fulfil. The hundreds of drawings that now go to the erection of any considerable building were wholly unknown. Plans and elevations were supplied, but, so far as can be gathered, the details were left to be arranged on the spot. A very much simpler method than ours, but one not compatible with the system of contracting, which demands that everything must be foreseen and tabulated, from a staircase to a chamfer stop, and that every variation from the pencil-and-paper arrangement shall be duly noted and valued. Gentlemen, the existence of the quantity surveyor is a marvellous tribute to the ingenuity of the human mind, and he is also one of the most noticeable barriers that divide the times of Elizabeth from those of Victoria.

But, gentlemen, it is not for us to deplore the fact that times have changed. They always have and they always will. It is for us to recognise that they have changed, and that we are expected to solve our own problems in our own way, instead of vainly seeking problems that may be solved by the old methods. The difficulties of Elizabeth's days are not exactly those of ours. The way in which the men of Elizabeth's days overcame their difficulties cannot be exactly our way. But we can recognise how well those difficulties were met, and if we are content to study the two things together, the questions and the answers, and to refrain from playing at cross-questions and crooked answers, we shall find great help in answering our own questions in our turn.

We have dwelt somewhat on the shortcomings of the architecture of Elizabeth's days to-night, but it must not, therefore, be supposed that we are blind to its excellences. The plans may be crude, but they are simple and stately in disposition, and the wants they had to meet were also crude. The elevations are to us always effective, partly from association but partly also from the quality of the means used. The mullioned windows give scale to the mass, the bay windows afford a simple method of avoiding monotony, the long lines of string-courses and the pierced parapets impart breadth to the design, while the gables and the tall chimneys produce a picturesque sky-line in a natural and easy manner. There is, undoubtedly, much in the detail of the time that is ill-considered and coarse, but we live in the light of the Victorian age, with all knowledge accessible and with better means for correcting our judgments and improving our tastes than were ever yet offered to mankind; and we may, if we will, find much in the architecture of Elizabeth which, purged of its coarseness and refined in the crucible of our minds, may go far to ennoble the architecture of Victoria.

The PRESIDENT, in inviting a discussion, alluded to Mr. Gotch as being engaged on a work illustrative of Renaissance work in England. He hoped its scope would be similar to that of the splendid work produced on the German Renaissance. Points in Mr. Gotch's address had recalled to his mind Bacon's description of the perfect palace. The study of it would be a good exercise for the imagination in the development of ideas of dignity, &c., which restricted sites did not afford. The treatment and unconventional use made of foreign forms gave these Renaissance buildings half their interest, and was one of the features which would repay study. Also the beautiful work in mantelpieces showed that the architects were masters of their art. Nothing, however, he thought could be more ghastly than some of the Elizabethan revivals, early in the century, carried out in Portland cement. What they had to consider was how to study the Elizabethan style with profit, and to select the best examples of the style for the purpose.

Mr. F. G. HOOPER proposed a vote of thanks to Mr. Gotch. The subject, he said, seemed a most appropriate one to bring before a body of students, as it dealt with a period when new demands were made on English architects and the opportunity was given of seeing how these demands were met. The time of Elizabeth was one of peace, and the system of fortified residences could be abandoned. The Church was being despoiled of its wealth to the enrichment of the nobles, who were anxious to show what could be done with the money, and the architects employed went abroad for their inspiration in Palatial style, the styles previously prevalent in this country being no longer suited to their wants. It would not fall to the lot of many to build a palace, but, in carrying out their more modest commissions, they could aim at some of the dignity for which the Elizabethan architects sacrificed everything. They need not sacrifice the comfort of the inmates of their buildings, but the designers could sacrifice their time in learning from the Elizabethan architects of England and of France. French architects held English architecture in great estimation, but they complained that it was too often wanting in dignity and simplicity.

Mr. H. O. CRESSWELL, in seconding the vote, said that perhaps the greatest blemish of Elizabethan architecture was slavish adherence to symmetry. As students they were taught the contrary to that, and to have a reason for each feature. As to the study of Elizabethan style one difficulty occurred, because it was a Renaissance carried out by men who believed they were reproducing Classic work, whereas an examination of the cornices, capitals, and other ornamental features, showed how great a difference there was between Elizabethan and Classic detail.

Mr. KERSHAW, M.A., said the special feature of interest that commended itself to their attention in the Elizabethan period was the originality displayed by the architects, who made their work a labour of love. He also expressed great admiration for the German Renaissance work.

Mr. L. A. SHUFFREY said that most of the charm of Kirby was the absence of that excessive symmetry found in the other Elizabethan buildings. They should be studied with caution, or they might get into difficulties. It must be remembered also that the buildings had gained much in picturesqueness by the softening hand of time, and being overgrown with moss. The effect of the architecture rising direct from the ground or the lawn seemed to him unsatisfactory. He also referred to the difference in building where time had not to be taken into account, and the system of the present day, when the whole building must be put on paper, and specifications drawn up for the quantity surveyor before a stone was laid.

Mr. BRODIE asked whether an architect in his design for a 20-foot street frontage should not pay some respect to the design of the next-door neighbour's house, by consulting to some extent the spirit of that design, instead of aiming at something quite different. The designs should not clash one with another.

The PRESIDENT put the vote, and it was carried by acclamation.

Mr. GOTCH, in replying, observed that he might say in confidence that he was engaged on a work on the English Renaissance on the lines of the German work mentioned by the President, and he hoped that in the forthcoming year some of the parts would appear. The President, he continued, had drawn attention to the terrible revivals in Elizabethan work. Those were failures because their authors had not gone the right way to work. If architects attacked their problems with common sense, they could go to Elizabethan times for hints, and by doing so obtain good results. But they must attack their problems in their own way, and while no styles of the past should be made their aim, they should be studied to learn how the architects of those days solved their problems. Mr. Aitchison had on a previous occasion suggested that the Association should give prizes not for any particular buildings, but for designs which embodied special ideas in architecture, that of dignity for one, as suggested by the President. Slavish



symmetry he condemned, but there was a line to be drawn between that and the extreme Gothic idea that every feature must have a distinct mission. If every window had to be varied according to the size of the room, the design would lose all rhythm. The English architects had not reproduced Classic styles. They had reproduced their recollections of Italian work, in other words, made reproductions of the imitations they had seen abroad. The effect of Burghley House was extremely marred by its rising from the ground without terraces, but originally he believed that the terraces existed. The builders of those days were more favoured, for they had not to build at railway speed as was now the case. The idea of assimilating designs of neighbouring houses, he thought, would not accord with the wishes of the owners, who desired to have no connection between their next-door neighbours or the man over the way.

The proceedings then terminated.

### MANCHESTER SHIP CANAL.

IT is just twelve months, says the *Manchester Guardian*, since the first sod of the canal was cut. On November 11 last year a number of the directors went over to Eastham and inaugurated the great work. Nothing could have been more simple than the ceremony. There was not a flag, not a note of music, not two words of a speech, not even a cheer. A spade which had seen some service, and had neither an ebony handle nor a silver blade, was handed to Lord Egerton by Mr. Walker, the contractor, and with this honest implement the chairman of the company, without more ado, delivered the first sod from its mother earth. The spade passed in turn to the directors, and each cut a sod. Mr. Leader Williams, the engineer, tipped a barrow containing the product of these labours, and the ceremony was at an end. The minute recording the proceedings states that the directors afterwards discussed "ordinary business." The necessary rudeness and bareness of all this is relieved by a single touch of sentiment. The spade with which the first sods were cut finished its work that morning, and now hangs, we believe, in Tatton Hall. Mr. Walker lost no time in buckling to his work. For some time he had been getting materials together, and within a week of the inauguration ceremony he had two thousand men on the ground. As the operations opened out, the forces were gradually increased, and at present the number of men is over 10,000. The men, however, represent but a small portion of the force brought to bear in this great digging enterprise. The bulk of the excavation is being done by the steam-digger, and of these mighty workers eighty-five have been pressed into service. Three of them are of German make, two come from France, and the rest are of English construction. In addition to these, 100 locomotives and 5,000 waggons are constantly at work, and the lines of rails put down for temporary purposes cover about 200 miles. So much effective strength has never before been brought to bear upon a contract of this kind, and as a matter of course the amount of work done has been enormous. The whole course of the canal is now in outline, and in some places the excavation is in a rough way complete. The progress made during the year is, we believe, regarded as eminently satisfactory, and there is every reason to believe the work will be finished to time. Mr. Walker has a name for getting done within the limit of his contract, and in the present undertaking his reputation is involved as it never was before.

It was on the site of the entrance locks that the directors cut the first sods. The particular spot has long since disappeared, and the whole look of the place has changed. The excavation in the great lock has been carried down to the invert level, a depth of about 50 feet. Further excavation will be necessary for foundation purposes, but the work is so far forward that the construction of the lock gates is in progress. It is difficult to give readers an idea of the great red gulf the steam digger has made here. The width of it is about 400 feet, and the average depth 35 or 40 feet. Its width of 400 feet it keeps for a distance of about 600 feet—the length of the largest of the three locks—and then tapers off into the ordinary width of the canal. In constructing locks of different sizes the engineer is, of course, not open to the charge made against the man who drove a large hole in his kitchen door for the cat and a smaller one for the kittens. Vessels of small tonnage could of course enter by the great lock, but it would be at an unnecessary expense of water. The great red gulf we speak of is a scene of enormous activity, and in face of the blinding smoke of locomotives and steam diggers it is not easy to grasp the details. At the lowest level the new red sandstone has been reached, and the final excavation will have to be done by blasting. But as a great deal of stone will be needed here for building purposes, it is no doubt convenient to have it at hand. Most of the marl and stone now coming out of this vast quarry goes towards Pool Hall, where the canal has to be taken across

a deep bight in the coast line. Some progress has been made with this work, but the embankment is not yet above high-water level. The number of men on the Eastham section is about 1,000, and for their accommodation a village of wooden houses has sprung up under the shelter of the hill. A new chapel, on much more handsome lines than the first hasty erection, has been built, and under the auspices of Mr. Morris, one of the contractor's agents, a reading-room has now been provided.

Between Ellesmere Port and Holpool Gutter the excavation has in various places been taken out to the full depth of the canal. Between Holpool Gutter and Weston Point the German steam digger has done good work, and is to have the assistance presently of one on the French system. The sluices at the river Weaver are to be started soon, and at the lock at Weston Marsh the work is so far forward that the concreting of the walls is now going on. On the Runcorn section progress is most noticeable at No Man's Land. Between Randle's Sluices and Latchford a great deal of blasting has been done, the rock coming nearer the surface here than at some other points. The diversion of the Mersey at Latchford Locks has been finished, and a start has been made with the railway deviation, which begins at a point near Warrington and ends at Thelwall station. Section No. 7 was the last section to begin work, but in the four months much has been done, especially in the excavation of the Irlam locks and the work connected with the deviation of the Cheshire Lines Railway.

The docks at Salford are in a forward state. As readers know, they are to consist of three branches opening out of the canal, which at this point is much wider than usual. The excavation of the mid branch is nearly complete, and on the Trafford Road side the concreting of the wall is in progress. The other branches are not so far advanced. The river will give some trouble at this point, and extensive works are in progress to take it out of the way for a time. The material dug out at Salford is mainly gravel, with clay and rock at the bottom. The gravel and rock will be used in making the concrete walls. The rest of the spoil is in part deposited on land near the racecourse, and in part sent down towards Stickins Island, where the diversion of the river is now complete. To a wonderful extent the various sections have so far turned out, as one might say, self-contained, each able to use up and dispose of its own spoil; and in a work extending over so many miles this is, of course, a matter of no small consequence.

### THE LIGHTING OF THE BURG THEATRE, VIENNA.

THE lighting of the new Burg Theatre in Vienna is on a scale that corresponds with the remaining work in a building which has taken fourteen years to erect, and has cost about a million sterling. The installation of the electric lighting was entrusted to two engineers from Geneva—MM. Emile Secheyay and Auguste Gardy. The plans were by M. Turrettini, and the general contract for the lighting was taken by the Imperial Continental Gas Association. The central station contains eight steam-engines, which act upon the dynamos, and through them transmit the currents underground by cables to the three batteries of coupled accumulators in the basement of the theatre. Owing to the strength of the batteries, from four to five thousand lamps can be kept alight during a performance without the aid of the engines. Two batteries are reserved for the illumination of the theatre in general, while the third is assigned for the stage exclusively. The connections are so arranged that each circuit can be put on either of the batteries, and in that way an equal and regular discharge is insured. The wires and cables have a length of nearly seventy miles. There are 5,300 lamps, varying from 10 to 40 candle-power each; the salle has 720, of which 370 are in the central lustre; the foyers, corridors, and staircases have 1,800; the rooms for performers, the ateliers, &c., have 800, and the stage alone has 1,970 lamps, being equivalent to 50,000 candle-power. An apparatus is employed to produce effects of dawn, night, lightning, and other combinations on the stage. The appliances have been specially designed, and are excellent examples of bronzework. An experience of fifteen months in the Vienna Opera House with 7,000 lamps has demonstrated that by the aid of accumulators illumination can be obtained which is equable and agreeable to the eyes, and that extinction becomes an impossibility.

A New Public Hall has been erected at Victoria Park, the ventilation of which has been carried out on the Boyle system, the latest improved form of the patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.



## NOTES AND COMMENTS.

It will be strange if we allow the Americans to anticipate us in the creation of a committee of taste, with powers to prevent the creation of eyesores in public places. The district of Columbia was able to pioneer a Bill through the Senate with that object—and similar Bills would be sure to follow from the remaining parts of the United States—but the excitement of presidential and other elections impeded its progress to the final stage. The project is, however, suggestive. The Art Commission was to consist of four eminent sculptors, four eminent painters, three eminent architects, and three to be selected "from other employments for their knowledge and good taste in art," all being nominated by the President. Four of the first batch were to hold office for one year, five for two years, and five for three years. Their successors were to be in office for three years. The architect of the Capitol was to be secretary and an *ex officio* member of the Commission. All the members were expected to serve without receiving more than their travelling expenses, which were to be audited by the secretary. The meetings were to be held at least once a year. The duty of the Commission was to "report upon the character and value of such plans of public buildings, monuments, or works of art as shall be referred to them by either House of Congress or the Joint Committee on the Library, and, when authorised by Congress, to select from designs offered by competitors for works of art ordered by Congress, and to render such other service as may from time to time be required of them by Congress." It is a pity so desirable a measure has not become law, but there may still be a chance for it.

It is proposed to fill the great west window of Gloucester Cathedral with stained-glass, as a memorial of the late Mr. GAMBIER PARRY. There could hardly be a better form of memorial, for Mr. GAMBIER PARRY was at one time almost as strong an enthusiast as Mr. WINSTON about stained-glass. Gloucester should respond generously to the appeal for the necessary funds, for Mr. PARRY rendered many services to the city and county. Besides, his distinction in the arts was reflected on that part of England. Mr. PARRY could talk and write well about art, but he could also paint better than most amateurs. His discovery of an enduring medium for use in wall-painting also merits recognition. The memorial-window should be entrusted to capable hands. We make this suggestion as it is proposed to make over the surplus funds to a child's hospital in which Mr. PARRY took much interest, and there is a temptation to stint the expenses on the window in order to enrich the hospital.

On Thursday in last week M. DE BAUDOT, the Inspector-General of Diocesan Works, began his course of lectures in the Galleries of Comparative Sculpture in the Trocadéro, Paris. The lectures will treat of French architecture from the thirteenth to the sixteenth century, and will explain the æsthetics of the style, the systems of construction and of ornamentation. The relation of the architecture of that period to the Renaissance will be discussed, and finally the advantages of a study of French architecture of the Mediæval and Renaissance periods will be impressed upon the auditory.

VASARI does not mention either the time when the elder PALMA was born or in what place. The painter is simply called a Venetian. Later researches established that his birthplace was in Serinalta, near Bergamo. Some critics have argued for PALMA's Venetian origin on account of the similarity between his works and those by GIORGIONE and TITIAN—indeed, in galleries his pictures often bear the names of those artists. A Bergamese influence is also discovered in his works by critics of a different class. An inquiry into the history of PALMA was lately undertaken by Signor FORNONI, of Milan. He has ascertained that the painter was a native of Serinalta, but the most remarkable discovery is that the true name of the artist was not PALMA but NIGRETTI. Whether writers on Italian art and the curators of galleries will take advantage of the discovery remains to be seen, but for the present generation at least the painter must be known as PALMA VECCHIO.

THE conversazione of the Birmingham Architectural Association, which was held in the Edgbaston Assembly Rooms, attracted about 300 members and friends. The proceedings commenced with a reception of the guests by the President and committee, after which a few selections of instrumental music were given in the ball-room. In the drawing-rooms were arranged a large collection of sketches and photographs, with some specimens of local art manufactures. The dancing began at 9.0 P.M., and was carried on for several hours. The conversazione was enjoyed by all who were present.

At the meeting of the Leeds and Yorkshire Architectural Society on Monday, the prizes were distributed after the delivery of the President's address. Mr. J. E. PRESTON obtained the President's prize of five guineas, with an extra two guineas for measured drawings of Harewood Church. The prize for members of the Associates' Sketching Club was awarded to Mr. CARBY HALL, with one for an essay. Mr. A. E. KIRK gained the prize for design.

At the present time there are 280 musées (picture-galleries and museums) in the provinces of France, to which the State contributes 300,000 francs a year. But that sum is supplemented by valuable gifts from private persons. The musées are divided into four classes. In the first class are such musées as the one in Lille, which is worthy of a metropolis. One great advantage of the provincial galleries is that they afford opportunities for the purchase of works by local artists who have made a name in Paris. The conservators of the local museums will be able to render valuable aid to the exhibition of retrospective art which is to be held next year in connection with the International Exhibition.

THE Irish mathematicians were at one time among the most zealous adherents of science in its "pure" form. But of late they have followed the example of mathematicians elsewhere, and have become adherents of the graphic method of solving difficulties. On Monday last Professor HAUGHTON, speaking as president of the Royal Irish Academy, said:—"The whole tendency of modern science is to substitute graphic methods for elaborate calculations. The figures are drawn by geometry, simple figures as conic sections *à fortiori*, simple figures as circles. When you want extreme accuracy you make your drawing on a larger scale, and by rapid drawing of a very wide kind you get approximate to the exact result. This is an enormous advantage, because you take the first results of the graphic method, and you see where the critical points of the calculation are, and, instead of going through the frightful labour of an arithmetical calculation of the whole, your attention is concentrated on the critical points of this graphic method. In application to physics the graphic method does not dispense with calculation, but diminishes the labour and concentrates the attention into the most minute details of the calculation." The President was probably thinking of results of a more or less general kind, but his words are almost as applicable as a description of the saving of time and the certainty of conclusions which are derived by the graphic method in constructive problems.

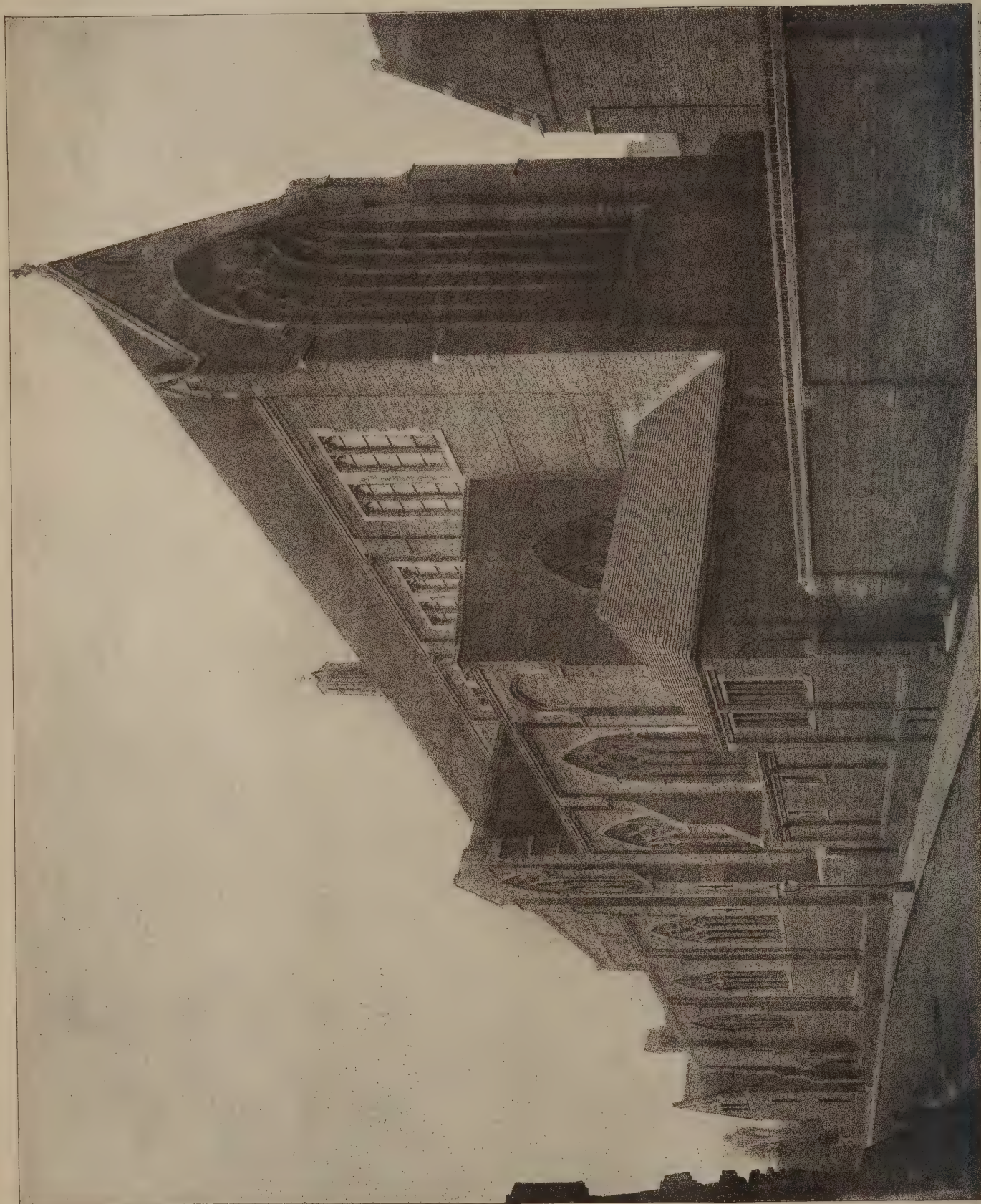
THE advantage of a clerk of works is not generally recognised in America. The following resolution on the subject was passed at the last Convention of Architects:—"The American Institute of Architects recommends as proper and desirable, the employment of a clerk of works in the erection of all buildings of importance as a means of obtaining the best results. He should be paid by the owner, but should be appointed by and under the direct control of the architect. The architect's supervision of and responsibility for the work should be in all cases insisted upon as vital to the vast interests of the owner, but such constant oversight as can be exercised by a competent clerk of works is an invaluable adjunct to the labours of the architect in securing uniformly good and honest work." The resolution is plain, and contains no statement which is not borne out by practice.







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S. AGNES CHURCH, KENNINGTON PARK.

GEORGE GILBERT SCOTT, Architect

PHOTOGRAPH BY J. J. WOOD, 15, LITTLE CHURCH STREET, LONDON E.C. 4.









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 ARCHITECTS



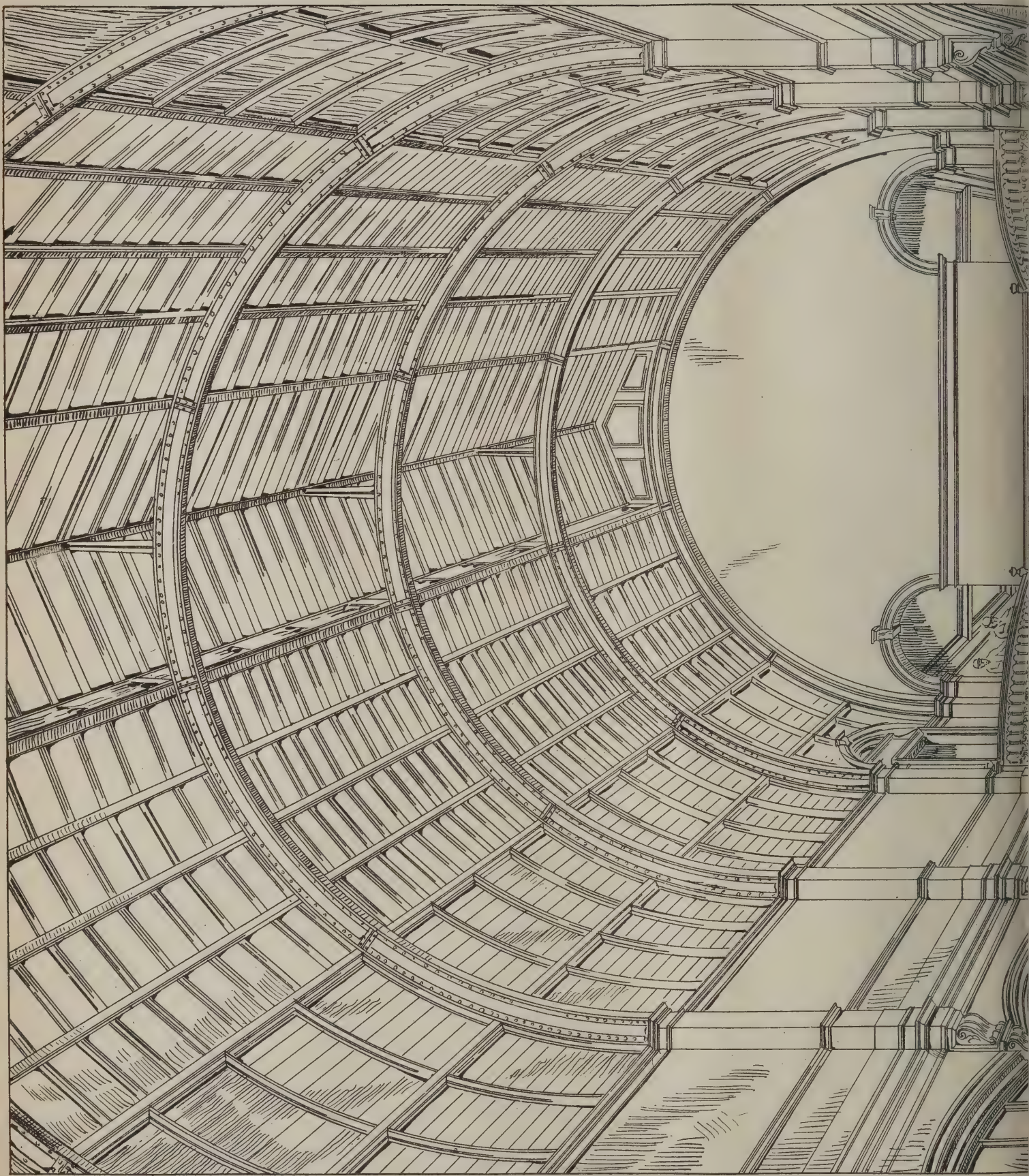






















The Architect. Nov<sup>r</sup> 16<sup>th</sup> 1888.



S. AGNES CHURCH, KENNINGTON PARK.

Geo. Gilbert Scott, Architect

THE PHOTOGRAPH BY SPRAGUE & CO., 22, MARTIN LANE, LONDON E.C.







# ILLUSTRATIONS.

## ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NOS. 40, 41.—ST. AGNES CHURCH, KENNINGTON PARK.  
[G. GILBERT SCOTT.]

### THE HUT, PINNER.

THE Hut, Pinner, now in course of erection for Lady WATKIN WILLIAMS, and of which we give illustrations in this number, is from the designs of Mr. JAMES RANSOME, architect, 26 The Boltons, S.W. It has been the architect's object, while keeping a practically square plan, with a view to minimising the cost, to obtain at the same time a picturesque exterior, and this he has achieved in spite of the total absence of unnecessary ornamentation about the structure by treating it in a simple English manner. The ground floor is in red brick, the first floor in half-timber construction, the posts being tarred, with distempered rough cast between, while the roof and gable over porch are hung with red tiles. The building contains three reception-rooms, all approached from the hall, and opening on to the loggia; seven bedrooms, a small boudoir, and the usual offices, bath-room, &c. Mr. BATCHELOR, of High Street, Harrow, is the contractor.

### LEEDS FINE ART GALLERY.

THE Leeds Fine Art Gallery forms an annexe to the large block of municipal offices which adjoins the Town-hall in Victoria Square. The art gallery portion of the building, erected at a total cost of from 10,000*l.* to 11,000*l.*, from the designs of Mr. WILLIAM H. THORP, A.R.I.B.A., was opened on October 3 last by the Mayor, Alderman A. W. SCARR, in the presence of the Marquis of RIPON, the Bishop of RIPON, Sir CUNLIFFE OWEN, the Lord Mayor of YORK, and the mayors of fifteen Yorkshire towns, Professor HERKOMER, A.R.A., and others. The following description appeared in one of the local papers and is fairly accurate:—

Mr. Thorp's building is in the Italian-Renaissance style of architecture, designed to agree with the adjoining municipal offices. The elevation to Centenary Street is faced with the best Bolton Wood stone; also the return ends to Alexander Street; the rest of the elevation to Alexander Street is faced with the best hand-pressed bricks neatly pointed. The architect has been guided largely in the leading features of the arrangements of his design by those of the Walker Art Gallery, in Liverpool, which is justly considered in these respects one of the finest provincial galleries in the kingdom. From the vestibule adjoining the sculpture-gallery, the new reading-room 100 feet by 32 feet is directly entered, while to the left the vestibule leads to three picture-galleries, two of 20 feet by 21 feet, and one now called "The Queen's Room," in size 42 feet by 36 feet. The centre of the site is occupied by the lofty, glass-covered central court, from which, as well as from Centenary Street, the reading-room obtains light. A conspicuous object in the centre is a fountain of glazed Burmantofts faience. This court is 60 feet by 36 feet, and is used for museum purposes, another museum court at the side being 60 feet by 25 feet, and another fronting to Alexander Street is 65 feet by 26 feet. The picture-galleries and central court are all throughout lighted from the roof. From the vestibule a fine staircase of ample dimensions ascends to the upper floor, where the space around the central court is utilised for picture-galleries, two fronting to Centenary Street measuring respectively 41 feet 6 inches by 30 feet, and 87 feet by 32 feet; the one on the opposite side of the court area being 60 feet by 24 feet, and the one across the Alexander Street end 64 feet by 25 feet. A small balcony completes the quadrangle; and there is also over the vestibule a gallery 41 feet 6 inches by 36 feet. The central court of the museum is approached from the staircase hall by means of an archway 13 feet in height underneath the centre of the staircase. An additional entrance to the reading-room is provided at the corner of Centenary Street and Alexander Street. The new reading-room coincides exactly in area with the old one. A new large picture hoist is provided with communications on each floor, and a large packing-room in the basement, with access to the open yard. The galleries are divided one from another by fireproof doors sliding into recesses in the walls. The walls of the galleries are lined with match-

boarding for convenience of picture-hanging, and the ceilings under the lanterns coved in plasterwork. The floors in all cases are fireproof, of iron joists and concrete. The roof over the central court is arched with wrought-iron ribs and glazed with Rendle's patent glazing. The columns in the vestibule and staircase wall and the staircase balustrades are carried out in polished Hopton Wood limestone. In "The Queen's Room" is a fine frieze, designed by Mr. Thorp, and carried out by Mr. J. W. Appleyard, which is relieved by panels bearing the names of Hogarth, Reynolds, Gainsborough, and Turner. The building is heated with hot-water pipes and well ventilated. It is lighted by electricity.

The work has been well carried out by the contractors, MESSRS. CRAVEN & UMPLEBY, of Hartley Hill, Leeds, Mr. J. T. BROWN being clerk of works.

### THE CHURCH OF ST. MARY-LE-STRAND.

THE rector and churchwardens have issued an appeal for funds to restore the church of St. Mary-le-Strand to its original state. To effect this it will be absolutely necessary to remove all the fractured stones and to cut out from the wall the iron chain bonds and cramps which have oxidised and split the stones, and which, unless removed, will continue to injure the building. The cost of thoroughly restoring the church and making it safe for public worship has been estimated by an architect of experience at about 3,000*l.* The parishioners are quite unable to defray the cost. The population of the parish is nearly 2,000, and those living behind the Strand are for the most part very poor people. The church in the Strand is the only place of worship which they can attend. It is, therefore, urgently necessary to solicit those who have the means to come forward as speedily as possible to save this beautiful building. The Bishop of London recently wrote as follows:—

"It is one of the most beautiful churches of its style that we possess, and the very greatest ornament to the spot where it stands. As it needs repair, I think you would not find an appeal to the public in vain. I beg of you to do your part to prevent so beautiful a structure from being defaced or destroyed. It will be a discredit to us in the eyes of all Europe if we show ourselves careless of such a work of art, long ago dedicated to God, and still serving the great purpose of uniting religious feeling with love of what is beautiful."

### THE LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

ON Monday evening the thirteenth session of this Society commenced, when Mr. Henry Perkin delivered the following address:—

As President it devolves upon me to open the session with an address from this chair, and having been a member of the Society since its formation in 1876, I have had an opportunity of watching and assisting its progress.

I can with pleasure congratulate you upon the sound condition of the Society, which I may do with reason, considering the conflicting interests which necessarily arise in a profession on such an unsettled basis as ours. Bearing this in mind, let me press upon you all the desirability of keeping up the spirit of good-will and mutual respect which distinguished our Society at its outset, and let me invite you (as I do with all cordiality) to assist me in endeavouring to maintain the dignity of the chair, and to promote the welfare of the Society during my term of office as your president.

The subjects which are appropriate for mention in an address of this kind are too numerous to treat fully. I have therefore made a selection of some items upon which I will say a few words.

The chief subject that has engaged the attention of our profession during the last year or more has been the question of "The proposed federation of Provincial Architectural Societies of British Architects," and I would point out to you that a copy of the "draft by-laws under supplemental charter," together with an invitation to become affiliated, has been received for our consideration. The proposed by-laws are arranged on a wider basis than those now in use, as in the following instances:—1. A seat on the Council of the Institute for the president of an affiliated Society (provided he is a member of the R.I.B.A.). 2. The substitution of voting by proxy for the expensive system which necessitates the attendance of country members in London. 3. A reduction in members' subscriptions of Societies affiliated to the Institute, and other minor matters which I need not enumerate.

There is one other point in connection with the business of the Institute which is perhaps of more importance than even



the federation question, I refer to the desirability of a diploma to practise architecture. This burning question has been shelved, although on this matter a predecessor in this chair, in 1885, said, "The Council of the Institute is in one respect entitled to unstinted praise. They have at last boldly determined to grapple with the diploma question in such a manner as to settle it permanently and effectually." From what I can gather (and in this I am corroborated by Mr. Waterhouse in his presidential address at the Institute last Monday), the Council of the Institute now considers that membership of its ancient body is a sufficient guarantee to the public of an architect's efficiency. With this conclusion we do not agree, and therefore cannot consistently be seen lodged in the same camp. Hence the logical necessity for our Society, and others who agree with us, to hold aloof from the Institute until it shall declare itself able to see eye to eye with us. Compulsory examination for membership of the R.I.B.A. will not meet the case, as hundreds of practitioners will remain outside and continue to practise as now, and the public will not have the advantage of a guarantee where most needed. Lapse of time has shown that the R.I.B.A., with its limited influence, is powerless to do much to protect our profession from empirics.

With a diploma to practise, I see the possibility of meeting the two chief disabilities from which we now suffer. In the first place, the average character of our architectural works is considerably below what it should be; because the public, being for the most part ignorant of architectural art and the proper procedure in regard to building matters, has been unable to discern who would be its best advisers; whereas, with the diploma it would have a guarantee that it had retained at least a man with practical and scientific knowledge, if not possessed of artistic ability, and this latter quality is not always required in every class of building. In the second place, with a diploma we should be able to regulate our numbers with more certainty than at present, and so prevent that overcrowding which brings about such lamentable results, and which acts with more keenness because, in the practice of architecture, the amount of work increases and decreases with greater uncertainty than in any other profession; besides, the necessity for passing examinations would draw into our body a better educated class of youths than those who now, in a haphazard sort of manner, scramble into it under the present ill-regulated system. I call to mind the case of a youth who not having completed his articles, commenced practice in a rapidly increasing neighbourhood, and secured considerable patronage. I need hardly point out to you that, under such circumstances, the property he erected is worth considerably less than would have been the case had a competent architect been employed.

If action could be taken by provincial societies to bring pressure to bear upon the Institute towards the attainment of the diploma, I am sure we should willingly lend our aid; therefore let us, in the meantime, maintain an independent position, until our united effort should induce the Institute to make an effort to band together the irregular troop of practitioners who now, according to their very diverse abilities, regulate building for an innocent public.

Up to the present, provincial societies have supported the prestige of the R.I.B.A., being of opinion that it would be better able to secure a diploma for the profession if only it could be induced to cast aside its old traditions and keep up with the spirit of the times. It is grievous to find that, after all the years of agitation in favour of the diploma, we should have to do the work again. I trust we shall not let the question rest, but renew our efforts with all energy, and I have no doubt they will eventually be crowned with success, and the practice of architecture take its legitimate position as one of the learned bodies.

There is another matter which has been referred to more than once by previous presidents of our Society: I mean the methods of conducting architectural competitions. As far as we architects are concerned, the great evil from which we have always suffered is the fact that we have no voice in the terms on which the transactions are conducted. We are individually compelled to compete and accept conditions offered us because we have no organisation strong enough to protect our interests. If the promoters of large competitions would advertise in the first instance for architects willing to compete, and then confer with them on the terms of the transaction, a great step in advance would be taken. It is certain if we do not arrange for fair terms on a legal basis before the competition takes place, we are not likely to obtain them afterwards. There should be a distinct contract between the promoters on the one hand, and the competitors on the other. It seems extraordinary that architects are so little able to protect themselves in a matter where so much expense is involved, experience having shown that we annually throw away thousands of pounds on ill-regulated competitions.

The problem before us is to reduce the waste of expenditure on competitions, and this may be accomplished in more ways than one without detriment to the public. It may be done by

limiting the competition to a selection of architects who are known to be more or less qualified for the work. Where it is found imperative to have open competitions (as in public and national buildings), care should be taken that the style of drawing and class of draughtsmanship be definitely fixed, otherwise the expenditure involved in elaborate water-colour drawings, mounts, and gold frames has no limit. Many a competition has been won solely by unstinted expenditure in this direction.

In the case of limited competitions, the money usually offered as premiums should be equally divided amongst the unsuccessful competitors, and the execution of the work entrusted to the author of the selected design. In public, open competitions, the premiums should be of equal value and more numerous than the first, second, and third prizes generally offered, and the first of which is one in name only, as it merges into the commission in case the work is placed in the hands of its author; thus the promoters get all the designs for the amount of the second and third premiums, the first being put forward as a bait, and the bulk of the expense falls upon the competitors, many of whom from inexperience are only too willing to compete upon any terms. It is not to an architect's advantage to work for the amount of the prize money, but it is for the execution and profit of carrying out the buildings that he competes.

If architects would take up this question and refuse to compete except under conditions to be agreed on, a large amount of unnecessary labour and cost would be saved to competitors, and men of high ability, who now refrain from entering the lists, would be induced to do so, and the public would have greater respect for us, if able to protect our own interests.

I do not propose following the custom of giving a list of buildings erected in this district during the past year, but I wish to mention the new Municipal Art Gallery. I am sure you will all agree that our friend Mr. Thorpe, in spite of the limited sum at his disposal, has produced a building admirable in every respect; and Colonel Harding, and other promoters, have earned the thanks of lovers of art, for providing a means of elevating the taste of the public on a question in which we, as artists, are so deeply interested.

I may also state that improvements are being effected in Briggate, where another arcade is in course of erection, and I hear a third will shortly make its appearance on the east side of the same thoroughfare. It is satisfactory to find that a large quantity of tumble-down property will be effaced from the heart of the town by these undertakings.

The chief extension of trade in this borough has lately been in the manufacture of wholesale clothing, in fact, the headquarters of this most enterprising branch of our commerce are now firmly established here, and large factories (in addition to those already erected) are being built to meet the growing demands of the trade. I note also the great increase of dwellings for the artisan class, which are springing up like mushrooms on every side of the borough.

We shall regret that the negotiations for the purchase of the Coloured Cloth Hall, and the buildings on the Quebec Estate by our Corporation, have, up to now, proved an utter failure, resulting from the exceeding care with which the authorities employ the borough funds. So much has been said upon this question, that I merely make a passing allusion to it, and put upon record our views, that the Council should not delay the purchase, with its consequent advantages to the town, for the sake of the amount in dispute, and so lose the opportunity for carrying out a long-wanted improvement. There can only be one opinion, that the approaches to the railway stations are quite inadequate, and an alteration permitting the erection of a new post-office would be a boon.

And now let me just for a moment refer you to the fine old abbey which stands almost at our door, and is in danger of destruction, or even worse. You will, I am sure, not think it out of place that as your representative I should urge upon the municipal authorities the desirability of acquiring and protecting from future damage this national monument, a valuable example of our ancient architecture. About fifteen years ago, you will remember, an attempt was made by a committee of gentlemen to purchase the abbey, with a view of restoring it to use as a church and clergy college. The late Sir Gilbert Scott reported favourably upon the feasibility of the scheme. It seems to my mind undesirable to utilise the building for modern purposes, which would necessarily involve alterations lowering the value of it as an historical record. At any rate, let us hope that negotiations for acquiring the abbey and grounds may meet with success, and that they may be preserved with care and veneration for the pleasure and education of ourselves and those who come after.

And now a few words upon the subject of County Boards, the formation of which will shortly take place, and no doubt will be of some interest to us as architects. In many cases existing buildings will (with partial alterations) be made available for the requirements of the Councils; but probably some new buildings will be required, and it will be interesting to observe



if the works will be placed in the hands of qualified architects. Much will depend upon the social standing of those elected to the County Boards. Up to the present, it is gratifying to find that the candidates who have signified their willingness to stand for election are of a high class, and we may augur from this that our profession will receive more encouragement than it usually does from municipal authorities.

An occasion of this kind gives us an opportunity of coming in touch with the public, and of showing the advantage of our services to them upon those points which at present they seem unable to appreciate, and which the following examples will illustrate. A city corporation being about to enlarge its ancient guildhall, has instructed its surveyor to carry out the works, with the assistance of an architectural draughtsman whose salary is not to exceed three pounds per week. No doubt this is a very economical arrangement so far as professional payment is concerned; but on the other side, what is to be said of the treatment the ancient edifice will receive, or of the probable extravagant cost that may accrue from the fact of the work being placed in incompetent hands?

Take another case. A large pile of buildings has recently been erected under the direction of a county surveyor, who for his extra services was paid about one-third the commission usually paid to architects. The authorities by this arrangement have saved a considerable sum in architect's fees; but if the works had been placed in the hands of an experienced architect, it is highly probable that the amount saved in the outlay upon the buildings would have been very much more than the commission, as the structure would no doubt have been constructed in a less extravagant (but equally substantial) manner by an architect than by an engineer accustomed to works of a more ponderous nature, and the gain from an artistic point of view would have been considerable.

In spite of the words of warning and encouragement given by my predecessor from this chair to our students, it is lamentable to find there has again only been one aspirant for the silver medal of the Society. And the Associates' Sketching Club has not maintained the reputation which it earned since its formation. This, I believe, has partly arisen from the removal of its two most prominent members from the town, who took great interest in the management of the club. One of them has returned, and I have reason to hope that the club will be placed on its former footing. I am most anxious to draw the attention of the students to the classes at the Yorkshire College—those on "Building Construction" being held under the direction of Professor Barr—and also to classes for the "higher forms of draughtsmanship," organised by Mr. Stephenson, who has recently been appointed head of the art department. Surely it is not too much to expect that our young men will supplement their studies by these means; for, depend upon it, the time is not far distant when the only entry into the profession will be by examination for a diploma. Unfortunately, there are some who act in matters relating to architecture and its subservient arts as though everything has been accomplished, and that nothing remains for us but to mix together the productions of our ancestors, and then dignify them with the title of designs. Opposed to this retrograde state of art, experience has shown that a skilled artist may produce new combinations of form with as much ease as a musician can produce changes of sound; we cannot make progress in any branch of our art by a slavish adherence to mere precedent. Every one views with admiration the richly elaborated windows of "airy tracery," whose fragile forms would almost seem to contradict their antiquity, and the intricate network on the towers of continental churches. Why, I ask, should not we inherit the spirit which prompted their designs? There is no mystery about the matter, for all forms are founded upon simple geometric laws, quite as palpable now as of old. Shall we make use of those laws? Shall our designs stand on their own merits, side by side with those of our forefathers? Let us extend our knowledge by utilising their experience, and try as far as we can to grasp the spirit of their work; but whilst admiring their charms, let us avoid mere copyism, so fatal to the progress of true art, and thereby rendering the would-be artist essentially a mechanic. Painters would not permit themselves to reduce their art to this degraded state; neither do sculptors rise as mere adapters of earlier works. Why then should the architect be chained to slavish imitation of the works of his ancestors? Let us, therefore, strive to render our art in its very best forms and worthy of the acceptance of our patrons.

And now, before concluding, let me on your behalf offer a tribute to the memory of our talented brethren who have passed away, notably, Edward PAnson, president of the R.I.B.A.; Sir Horace Jones, architect to the City of London; George Godwin, Royal Gold Medallist; and A. J. Beresford Hope, past president of R.I.B.A., and who, as an amateur, devoted much of his leisure in furthering the cause of art. The provinces have lost Cornelius Sherlock, Liverpool; James Salmon, Glasgow; and very recently James Sellars, Glasgow, who died at the early age of forty-five—all (with the exception of Mr.

Beresford Hope), I believe, men who have by their talents as designers, or as upright practitioners, contributed to the honour of our calling.

Gentlemen, I have to thank you for the forbearance with which you have listened to my observations, and which have been of a dry nature; nevertheless, at the risk of tasking your patience for a single moment, I would add that our list of papers for this session will be of a most instructive and entertaining character, three of them being of a popular kind. One will be delivered by Miss Garrett, of London, the subject of which is "Interior Decoration and Furniture." I sincerely hope that you will all as often as you can attend the lectures, so that those who read the papers for our instruction and amusement (each of whom comes from a distance) may receive a hearty welcome and due acknowledgment for their kindness.

#### COVERED WINDOWS AS ANCIENT LIGHTS.

ON Saturday an important judgment was given by Mr. Justice Kay in the case of *Cooper v. Straker*, which determines the question of how far windows which are almost continuously closed by shutters can be considered as ancient lights. The plaintiffs are the owners of a warehouse 80 feet high, which is used as a wool store. Most of the windows have iron shutters which, as a rule, are kept closed, but are opened when required. In 1887 the defendants removed some cottages and stables which stood opposite the north-west front of the wool store, and began to erect premises of far greater height upon the ground. An action was brought by the plaintiffs for an injunction, and the trial lasted three days. Judgment was reserved until Saturday.

Mr. Justice Kay said:—This case raises the question which has often been discussed in actions concerning light and air, namely, what amount of user is requisite to entitle the owner of a building at the end of twenty years to the right of receiving the light which passes over his neighbour's land to the windows of that building. The building now in question is a wool warehouse situate near Bishopsgate Street, in the City of London. The whole of this warehouse, except the top storey, was built in 1864. The windows which are now in question are—one upon the ground floor and the windows upon the first and second floors immediately above it, and also two adjoining windows on the last two mentioned floors, all of which, so far as the window openings are concerned, have existed in their present condition since 1864. The warehouse has been used all that period for the storage and sale of wool. There are, in all, six storeys above the basement, including the ground floor. The topmost storey is lighted by numerous side windows and also by skylights. The storey next below is lighted to some extent by the same skylights, by means of trap-doors underneath them in the floor of the topmost storey. Four or five times in a year there are public sales of wool in this warehouse, which last for six weeks at one period of the year, and shorter periods at the other sales, the shortest being about a fortnight. The windows in question, and most of the other windows in the building, have shutters of sheet-iron, like folding doors, hinged to the outside of the window openings, which when closed would completely exclude the access of light to the windows, and these shutters on the three lower floors were kept shut except when the business of the warehouse required them to be opened. Each floor had loop-holed doors for taking in bales by the aid of cranes, and in these doors were glass windows, considerably smaller than the proper windows of the building, but they were not closed, as I understand, by shutters. Bales were usually stored on the ground, first and second floors of this building by piling them up in every available place, including the space in front of the window openings, inside the rooms; but they were continually being moved for the purpose of the sales, and when they had happened not to be in front of a window, the shutters of that window would be opened to admit light for any work that might be going on near it. I have positive evidence of persons employed in the building that this was the case as to all the five windows now in question, and I think the true result of that evidence is that the shutters of all these windows were occasionally opened for the purpose of admitting light to the several rooms; that this occurred very seldom to the window on the ground floor, more frequently on the first floor, and still more often on the second floor. With respect to all these five windows I think that the shutters were more generally closed than opened. The claim of the plaintiffs is rested on section 3 of 2 and 3 Will. IV., cap. 71, which enacts "that when the access and use of light to and for any dwelling-house, workshop, or other building shall have been actually enjoyed therewith for the full period of twenty years without interruption, the right thereto shall be deemed absolute and indefeasible." The section requires that two things shall have been enjoyed—"access," which I think means over the neighbour's land, and "use," which must be the use of light so coming by the person who claims the right conferred by



the statute. Both that access and use must have been actually enjoyed with the house, and for the full period of twenty years without interruption. It was decided in *Flight v. Thomas* (8 "Cl. and F." 231) that the interruption there meant is explained by section 4 to be an interruption by the owner of the neighbouring land acquiesced in for a year. No such interruption has occurred in this case. It is not suggested that the plaintiffs have abandoned their right, as in *Moore v. Rawson* (3 "B. and C." 332), where the owner of the house, it was held, had done so by pulling the house down and building on its site a stable having a blank wall, which existed about fourteen years without any window. But the argument is that the plaintiffs have not enjoyed the use of light to these windows, or, at any rate, to the ground-floor window, within the meaning of the statute. That depends upon the signification of the words "actually enjoyed." Enjoying the use cannot mean shall have continuously used. If that had been the intention of the statute some such word as "continuously" should be found in this section, and it might then be necessary to show that the plaintiffs had never closed their shutters for a day during twenty years next before the action. I take "enjoyed" to mean, "having had the amenity or advantage of using" the access of light. That is nearly equivalent to "having had the use," the intention being that the owner of a house may acquire the right to have the access of light over adjoining land to an opening which he has used in such manner as suited his convenience for the passage of light during twenty years. One of the cases which touch this question most nearly seems to be *Yates v. Jack* (1 "Ch. App." 295), in which Lord Cranworth decided that the right conferred by the statute is an absolute indefeasible right to the enjoyment of the light without reference to the purpose for which it has been used. This was concurred in by Lord Chelmsford in *Calcraft v. Thompson* (15 "W. R." 387). In *Courtauld v. Legh* ("L. R." 4, Ex. 126) it was decided that the right was acquired for a house which was completely built and had windows in it, though it was not internally finished, and had not been inhabited except for a portion of the twenty years before action brought. It was held that this was an enjoyment by the owner of the use of the light, one of the learned Judges saying that this view met the justice of the case, because the intention to use the windows was unmistakably indicated. Baron Cleasby says that the fallacy of the defendants' arguments was "in assuming that for actual enjoyment of light the party having it must take all the benefit which he could derive from its use." Baron Channell intimates that there might be an exception in the case of windows with iron shutters fixed behind them, but the essential word in that sentence is "fixed," which obviously means either shutters that will not open, or shutters that are never, in fact, opened during the twenty years. It was argued that such a use as was made of the windows in this case would not intimate to the owner of the adjoining land that light was being enjoyed. I do not agree with this argument. If it be essential that the light should be so enjoyed as to give him notice, the window openings in this case were formed in 1864. The shutters were movable; they were opened from time to time; and he must have been extraordinarily negligent or indifferent if he did not from these facts understand that a right might be gained. I asked counsel how often the shutters must be opened during the twenty years to gain the right conferred by the statute. The answer was, a reasonable number of times. That would be to determine an uncertain thing by something still more uncertain. The owner of the dominant tenement might well say, "My use has been reasonable; this is my mode of enjoying the light; you might have stopped it if you pleased at any time within twenty years." I am of opinion that, in the case of windows with movable shutters, which are opened at the owner's pleasure for admission of light, the right is gained at the end of twenty years if he opens them at any time he pleases for the admission of light during those twenty years, and there is no such interruption of access over the neighbouring land as is contemplated by section 4. In such a case, it being proved that the window openings have remained unchanged for twenty years, and that the shutters were constructed so that they might be opened or closed at the pleasure of the owner, in my opinion the onus is thrown upon the owner of the neighbouring land to prove that the right has not been gained. In this case he has not proved this. I think that, under the circumstances, the plaintiffs have acquired an absolute right to all the light coming to their ancient windows over the defendants' land, as it has come during the twenty years next before this action, just as though these windows had been open for the admission of light during all that time. By consent of both parties the matter was referred at the trial to two arbitrators and an umpire, who were to inquire whether the proposed building was proper; and if not, to determine what sort of building the defendants might erect. The umpire has made a report, the effect of which is that the building proposed to be erected by the defendants, according to the last plans submitted by them to the plaintiffs, would have interfered too much with the access of light to the windows in

question; and he has described the building which the defendants ought to erect. The defendants, before the trial, suggested an arbitration, which was not agreed to; and on that ground they now urge that costs should not be given against them. If they submitted to the finding of the arbitrators or umpire there would be some reason in this; but they do not submit to the award which has been made, and have raised questions of law which, if they had succeeded, would have defeated the findings of the umpire. I must now grant a perpetual injunction to restrain them from erecting any building upon their land which will interfere with the light coming to the plaintiffs' ancient windows more than the building recommended by the umpire. The defendants have been wrong throughout, and must pay the costs of the action and reference.

### THOMAS USTICK WALTER, THE AMERICAN ARCHITECT.\*

THOMAS USTICK WALTER, second president of the American Institute of Architects, was born in the city of Philadelphia, September 4, 1804, and died in the same city, October 30, 1887, being at the time of his decease the oldest practising architect in the United States. He was the son of Joseph S. Walter, and of Deborah, his wife, and was named after the Rev. Thomas Ustick, a well-known divine during the early years of the present century.

In boyhood Mr. Walter displayed a predilection for mathematics. His education was liberal, but not scholastic. In 1819, being then fifteen years of age, he entered the office of William Strickland, the architect of the Custom House, the Mint, the Merchants' Exchange and Marine Asylum, and other buildings in Philadelphia, and of the State Capital of Tennessee, in Nashville, within which structure he is buried under a suitable monument. From his own writings it is learned that Mr. Walter remained with Strickland until he had acquired the art of linear drawing and a general knowledge of the profession of architecture, after which he resumed his general studies, and went through an elaborate course of mathematics. During seven years he devoted himself to the study of physical sciences, to the cultivation of the arts of drawing and painting, and to the attainment of practical knowledge of the several branches of mechanical construction, while at the same time, in his moments of leisure, he studied landscape-painting in water-colours under the direction of Wm. Mason, a celebrated teacher of that art in Philadelphia.

In 1828 he again entered Mr. Strickland's office, devoting himself exclusively to architectural study, the practice of which he commenced in 1830, and in the following year designed the Philadelphia County Prison, which was his first important work, his plan for same having been adopted and the construction of the work entrusted to his care.

In the year 1829 he was elected a member of the Franklin Institute of Pennsylvania, and subsequently was elected one of its Board of Managers, and in 1846 was chairman of the Board. Mr. Walter's interest in the Franklin Institute was manifest from the first, and he entered heartily into its councils and discussions. At this early date the public taste for correct architecture was wholly undeveloped, but he worked and argued for the advancement of his art. This enthusiasm bore fruit; and in 1835 it was voted, "That a course of lectures on architecture delivered annually before this Society is indispensable, as well to accomplish the ends as to promote the prosperity of the Franklin Institute; and that it is hereby recommended to the Board of Managers to secure the delivery of such a course next winter." The times were not altogether propitious for the establishment of a regular professorship, but at the beginning of the next year Mr. Walter was requested to deliver voluntary lectures. These lectures he continued to give from time to time, and his name appears in the Journal of the Institute, to which he frequently contributed as "Professor of Architecture."

He fully appreciated the dignity of his art, and from the first his pen and his public utterances all tended to one end—its elevation and the cultivation of high aspirations among its practitioners. Thus, in 1841, he writes:—"If architects would oftener aim to think as the Greeks thought, than do as the Greeks did, columnar architecture would possess a higher degree of originality, and its character and expression would gradually become conformed to the local circumstances of the country and the republican spirit of its institutions." Among the articles in the Journal which appeared from his pen during these years may be enumerated the following:—"Architecture in the Middle Ages," "Formation of an Artificial Spectrum," "Orders of Architecture," and general articles under the head "Architecture"; elaborate reports and descriptions of the designed constructions of the County Prison and of the Girard

\* A paper by Mr. G. C. Mason, read at the convention of the American Institute.



College (which he was then building from his own designs), besides numerous other articles.

Mr. Walter's professional practice rapidly increased after his design for the Girard College for Orphans was adopted in 1833, the corner-stone of which building was laid on July 4 of that year. When the structure was complete in 1847 he was elected one of the Board of Directors for the college, and served in that capacity for three years. In 1838 the Building Committee of the college sent Mr. Walter to Europe for the purpose of "Examining the practical workings of the various devices and appointments for health, convenience and comfort, in the principal seats of learning in Great Britain and the Continent," with a view to derive such information on these subjects as would be likely to prove useful in fitting up and furnishing the building of the college.

We must now refer to an event which advanced architectural development and was the beginning of systematic and united methods of architectural practice in the United States, viz, the attempt in 1836 to found an American Institution of Architects. At that time there was only a little over a half-score of properly trained architects in the country. These gentlemen met in the city of New York on December 7, 1836. Mr. Walter was one of the pioneers and most active promoters of the movement, and of the group of architects who met on that day one alone remains, Alexander J. Davis, the architect of the University of the City of New York and of many other important edifices, and now a corresponding member of this Institute. A draft of a constitution was formulated, and the members adjourned to meet in Philadelphia on the first Tuesday of May 1837. The circular calling for this meeting, dated March 23, 1837 (a copy of which interesting document hangs in the office of the Institute in New York), was signed by Thomas U. Walter, secretary.

The meeting took place at the Pennsylvania Academy of Fine Arts, but it embraced only a handful of members, and it was found that they were too much scattered for mutual sustenance and the strength necessary for a brotherhood.

The Institution struggled for a while, flickered, and was apparently quite extinguished, though it was really from its ashes that our present Institute, Phoenix like, sprang.

Mr. Walter's position was soon assured, as his merits were appreciated by numbers of influential citizens, who rewarded him with their patronage, by confiding to him the designing and construction of noble works built in the pure Classic style of which he was the most strenuous advocate and enthusiastic student.

In the early days of his successful practice it was generally the custom in Philadelphia to have the dwelling and office of architects in the same building or adjoining each other, and thus there was a more intimate and friendly acquaintance between the students and the preceptor's households than in these times. Mr. Walter was always affable and kind towards his students, and always took pleasure, during his leisure moments in the office, in lectures to them and imparting knowledge in practical and æsthetic subjects; but, although he had many during his early career, most of them lacked the patience and perseverance necessary to acquire the requisite knowledge to become successful practitioners, and eventually drifted into other pursuits.

Among Mr. Walter's works of private practice may be enumerated the St. George's Hall, the Preston Retreat, the Debtors' Apartment, the Philadelphia Savings Bank, and several churches in Philadelphia, the Chester County Bank, the Biddle and Cowperthwaite villas on the Delaware river, and other buildings in the country. But all these creditable labours were but the training and leading up, as it were, to the one great work with which his name must ever be associated—the extension of the National Capitol at Washington, together with the noble dome which surmounts and dignifies its mass.

The appointment of Mr. Walter as architect to execute his design for the extension of that truly noble building was made by President Fillmore, in 1857. It was well merited, for, of all American architects of that date, Mr. Walter was the best fitted by steady and innate love for the purest types of Classic architecture to grasp successfully the problem of the Capitol extension, and to design the dome with which he later glorified and crowned his work. The boldness of his composition evinces his skill as a designer and his confidence in himself. The vast wings forming the extension are of white marble of treat hardness and durability. They have taken upon them with years a delicate pearly colour, which, as it shows itself in the long colonnades, gives them an effect of purity and beauty.

Much as we pride ourselves upon the advances made in architectural design, we have nothing to show more nobly simple and well studied than this, the grandest of Mr. Walter's works. Such is the verdict of the architect and the critic.

Ferguson, the historian of architecture and often a severe censor, writes:—"Taking it all in all, however, there are few buildings erected in modern times which possess to a greater extent than the Capitol at Washington appropriateness of

purpose combined with the dignity necessary for the Senate House of a great nation. It has not the variety and richness of detail of our Parliament House, but it is a far statelier building, and its faults are those of the age in which it was commenced, and which here tied the hands of subsequent architects, and prevented them from using the improvements that have since been introduced in the arts of design; but it wants but very little to enable it to attain to very high rank amongst the buildings of its class in other parts of the world."

The Hon. J. H. B. Latrobe, son of the architect of the original Capitol at Washington, Benjamin W. Latrobe, thus eulogised Mr. Walter, in an address before the American Institute of Architects in the city of Washington, at its fifteenth convention in 1881. Speaking of the extension of the Capitol, he said:—"I can scarcely speak in his presence (President Walter being in the chair at the time) as I would like to speak, could I find words to do justice to the last architect of the vast pile that now looks down upon the Federal city. The pupil of Strickland, as Strickland was the pupil of my father, it has been with me a pleasing fancy for more than a quarter of a century to believe that there was, in a faint way, a law of descent, applicable under the circumstances, which connected the architect who clothed Thornton's skeleton with sinew and muscle and beauty, until the whole creature became his own, with his brilliant, refined, and accomplished successor, who, at the head of a profession socially to-day without a superior, has absorbed all that has been done before in what is now the Capitol; who, making the magnificent dome, on whose iron sheets the hammer never ceased to ring during the war that threatened to make the whole structure worthless, has screened the exterior littleness of a vitiated taste, and made even the incongruities of the Italian Renaissance subserve the purposes of genius."

Ill-health compelled Mr. Walter to resign from the service of the Government on June 1, 1865, and he then returned to Philadelphia.

Among the important works that Mr. Walter executed in Washington for the Government between 1865 and 1875 are:—The extension of the Patent Office, the repairs of the Congressional Library, the extension of the Treasury building, the General Post Office extension, the Government Hospital for the Insane.

In 1849 the honorary degree of Master of Arts was conferred upon Mr. Walter by Madison University, N.Y. In 1853 the University of Lewisburg, Penn., conferred upon him the degree of Doctor of Philosophy, and in 1857 Harvard University gave him the degree of Doctor of Laws. He also became a member of the American Philosophical Society of Philadelphia. In 1860 he delivered a course of lectures on architecture at Columbian College, D.C., and also in Philadelphia and vicinity.

Dr. Walter was now well advanced in years and full of honours. After his return from Washington he engaged in but little private practice. When the erection of the new City Hall in Philadelphia was commenced, he became connected with Mr. John McArthur, jun., the designer and architect of that building, and continued to assist him on its work until a short time before his death.

Of Dr. Walter's connection with the American Institute of Architects, the profession may well be proud. The original Institution of Architects had slumbered for nearly twenty years when the present Institute was founded in 1857, and on February 23 of that year Dr. Walter was elected a Fellow. On the retirement of its first president, Richard Upjohn, in 1876, he was elected its president, which office he filled continuously until his death.

At his last election to the presidency, on December 2, 1886, he thus expressed his thanks to the convention; the words, simple and touching, are not to be forgotten by those among his active associates in Institute work who heard them, and seemed to them prophetic of the great change so soon to come upon him.

"I return you my thanks, gentlemen, for your kindness and for your forgiveness. You might have done better all the time, but I began with you almost at the beginning and have been in my place as often as it was possible, and have done the best I could; and I intended when I came here to decline a re-election, but my friends here have been very kind, and have asked me to agree to it if re-elected, and I have agreed to it for another year. After that, if I live that long, I will ask you to allow me to take a rest. As to the year before us, I promise you to do all I can for the promotion of the prosperity of our profession, here and everywhere—for the promotion of the interests of our Institute. Everywhere and at all times I am yours, asking you to look over my imperfections and to enable me to feel still further that I have your assistance in all matters connected with our profession. I am deeply interested in them and have been so for nearly sixty years. I shall not be troubled that way sixty years longer. Accept my thanks, I pray you."

We have thus followed the career of Dr. Walter from youth



to revered old age. His position in American architecture is a proud one. As he modestly puts it himself in the above address, "I began with you almost at the beginning, and have done the best I could."

As an architect and scholar, Dr. Walter's professional learning was deep and well digested. In style of architectural composition, pure, artistic, and dignified. In social life he was ever the cultured gentleman. In personal appearance, venerable and commanding. "Truth in art" was the keynote in his professional career—the fundamental law which he laid down for himself and the burden of all his writings and public utterances. "Let us live," he once said, "for the promotion of our art. Let us leave no stone unturned to devise throughout the world the elements of a pure and correct taste."

One more quotation from Dr. Walter's address to the Institute of Architects and I will close this memoir. The last words of his annual address of 1880 speak the whole life of the man; no stronger or more heartfelt words could come from the lips of the Nestor of American architects:—

"We owe it to our country, to the age in which we live, to our families, to ourselves, to devote the rapidly fleeting hours of our lives to the accomplishment of the greatest possible good in our vocation; ever seeking to discharge our duties in all good conscience towards those whose interests are entrusted to our care, towards co-workers in the realm of art, and towards Him in whom we live, and move, and have our being."

### RESTORATION OF THE DOGE'S PALACE.

A CORRESPONDENT of the *Scotsman*, writing from Venice on November 6, says:—The great work of restoring the exterior of the Doge's Palace at Venice, which has extended over more than a dozen years, was completed the other day, when the last bit of scaffolding was taken down. As everyone knows, two rows of marble columns and Gothic arches, one row above the other, run round the two main façades of the Palace, that towards the Piazzetta and that towards the Riva Deglia Schiavoni, and upon these rest the lofty massive walls of the building. The whole fabric depends for its stability on the soundness of these ranges of shafts and arches. If they gave way ruin must be the speedy result.

It was amongst these that decay had not only begun to work, but had made serious havoc, so much so that unless this work of restoration had been accomplished this palace, unique amongst the buildings of the world, must have gone to pieces.

I had lately the good fortune to visit the works under the escort of one in charge, and of having the methods of restoration explained to me. He showed me scores of massive shafts and capitals all cracked and shattered. In many cases their separated pieces were only held together by strong bands of iron. He told me how these noble monoliths had been thus split and rendered useless. It had been brought about partly by the Great Fire of 1574, and partly by the oxidising and consequent swelling of thick iron bars that penetrated them just beneath their capitals. In all 116 of such damaged shafts have been removed, and new ones put in their places. In the removing of each one of these the greatest care had to be taken lest any giving way should take place in the walls above. By careful propping this was happily avoided. One of the most masterly removals and replacements was that of the shaft which supports the "fig-tree" angle of the palace. Here it was found that even the oaken piles on which the shaft stood required renewal. The work was accomplished without a hitch. By the use of copper and gutta-percha the evil of rusting in the new bars has been dealt with. The decorations of the capitals have been reproduced with the utmost exactness. Only skilful sculptors were employed, and an art committee scrutinised every stroke of the chisel. I know that in one case where a face had been knocked off a capital and lost, the committee met time after time to consider, not its character, for that was known perfectly from others on the capital, but simply the exact way in which it had originally been set. All the antique columns, capitals, and stones have been arranged and catalogued, and will be carefully preserved in the palace itself, so that reference to any original piece of work can be made at any time. The Venetians are proud that not a single accident occurred during these many years of labour, and they are to be congratulated on the completion of this great work, which restores to something of its original solidity this palace, which belongs, not to Venice, but to the world.

### NEW BUILDINGS.

**Oldham.**—The Oddfellows' Hall, an unpretentious building, which takes the place of the present club in Union Street, has been designed in the Renaissance style of architecture, and although it does not pertain to any great architectural beauty, yet it will vie in design with any other public structure in the immediate vicinity. On the ground floor are three lodge-rooms, each measuring 24 feet 9 inches by 12 feet, and a small

concert-room, 23 feet 6 inches by 21 feet 6 inches, the whole being fitted up with lattice seating. The billiard-room, which is also on the ground floor, provides accommodation for two billiard-tables, and, like the lodge-rooms, is fitted up with lattice seating. The bar is centrally situated, adjoining to it being the smoke-room, which measures 16 feet by 11 feet 9 inches. Two broad staircases, of easy ascent, providing ample means of egress in case of panic, lead to the assembly-hall, 64 feet 6 inches by 36 feet, on the first floor, of lofty proportions, and with coved and panelled ceiling constructed on the best acoustic principles. A large platform extends across one end of the hall, and is immediately connected with the ladies and gentlemen's retiring-rooms placed on both sides of the hall. The hall itself is well adapted for public meetings, balls, concerts, or parties, the exits well arranged, and the acoustics good, and the heating and ventilating carried out on the best principles. A private staircase is provided for the convenience of speakers, and the floor of the hall is fireproofed, being carried by longitudinal rolled-iron girders and small girders running at right angles, the space between being filled in with concrete boarded over. In the basement are kitchen heating cellar, &c., with hoist to carry articles from the basement to the ground or first floor. The building is faced externally with local stock bricks, relieved with Ruabon terra-cotta and sandstone dressings, the roofs being slated with Welsh slates, capped with Ruabon ridge tiles. The contract for the work was let to Mr. E. Stephenson, the sub-contractors being:—Mason, Mr. A. Staley; joiner, exors. of E. Whitaker; slater, Mr. Jos. Jackson; plasterer, Mr. F. Kelly; concreter, Mr. Lowe, Farnworth; plumber, Mr. Bates. The heating apparatus has been supplied by Messrs. Scott Bros., Oldham. The plans have been prepared and the work erected under the supervision of Mr. A. Banks, architect, Union Street Oldham.

### CHURCH BUILDING AND RESTORATION.

**Hindlip Church.**—This church has been reopened after being restored and enlarged. The church will now contain seats for 138 persons, being 40 more than before the enlargement. Mr. Lewis Sheppard, of Worcester, is the architect, and Mr. Collins, of Tewkesbury, the builder.

**Guildford.**—The church of the Holy Trinity has been reopened after extension by the addition of chancel, transepts, and organ chamber. The work has been carried out from the designs of Mr. A. W. Blomfield.

### GENERAL.

**Sir Richard Wallace** has consented to lend a large portion of his collection of pictures to the Royal Academy this winter for the Old Masters Exhibition. A collection of pictures by the late Frank Holl, R.A., will also be exhibited.

**Funds** are being collected for the purchase of pictures for the art gallery in the town of Dudley, with a view of making that institution a permanency.

**The Governors of Heriot's Trust** have received a report stating that the total cost of the building and fitting up of the Hospital School and Technical Buildings and the Heriot-Watt College had been 49,085*l.*, and that that sum had been paid out of the stock of the hospital without borrowing a penny.

**Mr. Ernest Day**, architect, has been elected Mayor of Worcester.

**Mr. Fred Chancellor** has the distinction of being the first Mayor of Chelmsford. Mr. Frank Whitmore, who had carried out the duties of that office as provisional Mayor, presided over the meeting at which the election took place.

**The Paddington Vestry** intend to obtain plans and specifications to enable them to proceed with an application to Parliament for a license to supply the electric light for public and private purposes throughout the parish.

**The School Board for New Kilpatrick** have approved of plans for the extension of Milngavie School, at an estimated cost of 720*l.*

**New Technical Schools** at Shipley were opened by the Master of the Clothworkers' Company on Tuesday. The schools have been built at a cost of 11,000*l.*, and in addition to this the Governors found themselves with a deficit of 4,000*l.* in connection with last year's exhibition. After deducting the subscriptions received, there was still a deficiency of 12,000*l.*

**Llandaff** has just been lighted with gas for the first time, being probably the last city in the kingdom which retained the old-fashioned system of lighting.

**A New Church**, built from the designs of Mr. T. G. Jackson, has been opened for the chapelry of St. Peter's, in the parish of Bishop Waltham. It adjoins the old building, which is to be pulled down.

**CRIMINAL PROCEEDINGS**, under the new Merchandise Act, will be instituted against any person falsely representing any form of ventilator to be a Self-acting Air-pump Ventilator, said title being registered and our Trade-Mark, applicable only to ventilators manufactured by us. Any infringement renders the person infringing liable to two years' imprisonment. ROBERT BOYLE & SON, Ltd.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, NOVEMBER 16, 1888.

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### EDITORIAL NOTICES.

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

### TENDERS ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

### NOTICE TO THE PUBLIC.

By the Post Office arrangements THE ARCHITECT can now be sent to any part of the United Kingdom by an affixed Halfpenny stamp; hitherto the postage has very frequently been twopenny per copy. The Publishers will be happy to forward, for 20s. per annum, post paid, THE ARCHITECT, to residents in towns and neighbourhoods to which there is no easy access by railway. Terms for the half-year, 10s.

Our readers are invited to address us on subjects of interest to themselves or the public. We shall be always ready to insert letters asking for a solution of any suitable questions to a professional or practical nature, and to receive replies of such inquiries.

### COMPETITIONS OPEN.

CARLISLE.—Designs are invited for Board Schools proposed to be built in Ashley Street. Premiums of 20% and 10%. The Clerk to the School Board, 27 Lowther Street, Carlisle.

CHERITON.—Nov. 29.—Premium of 50% is offered by the Guardians of Elham Union for the best method of Sewage and Rainwater Disposal. Mr. R. Lonergan, Saltwood, Hythe, Kent.

FOLKESTONE.—A premium of 50% is offered for the best Plan for dealing with the Buildings and Grounds of the Art Treasures Exhibition for Pleasure Gardens. Mr. Alfred H. Gardner, Solicitor, Folkestone.

SCARBOROUGH.—Designs are required for Laying-out Weaponess Valley Estate. Premiums of 150% and 50%. Mr. Joseph Patch, Borough Surveyor, Town Hall, Scarborough.

### CONTRACTS OPEN.

ASHTON-UNDER-LYNE.—For Extensions and Alterations to District Infirmary Wards. Messrs. T. D. & J. Lindley, Architects, Ashton-under-Lyne.

BLACKHILL.—Nov. 24.—For Building Small Farmhouse, &c. Rev. J. J. Cundhill, Muggleswick Vicarage, Blackhill, Durham.

BOOTH TOWN.—Nov. 16.—For Building Six Houses, Mr. Joseph F. Walsh, Architect, Waterhouse Chambers, Halifax.

CHILBOLTON.—Dec. 1.—For Building House. Mr. John Hillary, Architect, Longparish, Hants.

CLEATOR MOOR.—Nov. 16.—For Altering No. 45 High Street. Mr. J. S. Moffat, Architect, 53 Church Street, Whitehaven.

CLECKHEATON.—Nov. 26.—For Erection of Public Baths. Mr. R. Castle, Cleckheaton, and Mr. W. H. Howarth, Cleckheaton, Joint Architects.

COVENTRY.—Nov. 17.—For Building Liberal Club. Mr. H. Quick, Architect, 28 Hertford Street, Coventry.

DOVER.—Nov. 24.—For Building Premises, Cannon Street, for Messrs. Wright Bros. Messrs. Cresswell & Newman, Architects, 54 Castle Street, Dover.

DUBLIN.—Nov. 21.—For Boundary Walls and Alterations to Auxiliary Workhouse, Cabra. Mr. T. H. Alkinson, Clerk to the Guardians, North Dublin Union, North Brunswick Street, Dublin.

EARLSHEATON.—Dec. 10.—For Building Power Loom Sheds, Engine and Boiler-houses, and Long Chimney. Mr. F. W. Ridgway, Architect, Church Street, Dewsbury.

FINSBURY.—Nov. 16.—For Construction of Underground Urinals, Water-closets, &c., South Place. Mr. H. Blake, Sewers' Office, Guildhall, E.C.

HASTINGS.—Nov. 30.—For Building Mixed School and Offices at Ore. Mr. F. H. Humphreys, Architect, 6 Trinity Street, Hastings.

LANDPORT.—Dec. 4.—For Erection of Stands, &c., in Drill Hall, for the Annual Tournament. Mr. A. H. Bone, Architect, Hanover Street, Portsea.



LEEDS.—Nov. 21.—For Altering Two Houses into Three Houses and Two Shops. Messrs. J. Charles & Sons, Architects, 98 Albion Street, Leeds.

LEIGH.—Nov. 31.—For Alterations to the Town Hall, for the Leigh Local Board. Mr. J. C. Prestwich, Architect, Leigh.

LEIGH.—Nov. 31.—For Painting, Paperhanging, Decorating at the Town Hall, for the Leigh Local Board. Mr. J. C. Prestwich, Architect, Leigh.

NOTTINGHAM.—Nov. 19.—For Erecting Additional Workshop and Alterations at the Union School. Mr. A. H. Goodall, Architect, Market Street, Nottingham.

PITSLIGO.—Nov. 26.—For Building Parish Church. Messrs. Matthews & Mackenzie, Architects, 255 Union Street, Aberdeen.

PORTSMOUTH.—Nov. 21.—For Building Quarters for Aged Married Couples at the Portsea Island Union Workhouse. Mr. Archibald H. Ford, Architect, High Street, Portsmouth.

ULVERSTON.—Nov. 16.—For Building Candle Manufactory upon the Ellers Paper Mill Premises. Messrs. J. W. Grundy & Son, Architects, Central Buildings, Ulverston.

WINCHMORE HILL.—Nov. 23.—For Two Additional Pavilions and Additions, &c., to Administrative Block, Northern Hospital. Messrs. Pennington & Bridgen, Architects, 8 John Street, Adelphi, W.C.

### TENDERS.

#### BARNET.

For Construction of Screening Chamber, Tank, &c., at Farm, for the Barnet Local Board.

W. Nicolls, Wood Green	£215	0	0
T. Torode, Tottenham	199	0	0
Smith & Hancock	180	0	0
G. BELL, Tottenham (accepted)	175	0	0

#### BRADFORD.

For Building Weaving Shed, Westbrook Mills, Bradford. Mr. JOHN DRAKE, Architect, Winterbank, Queensbury.

##### Accepted Tenders.

Balmforth & Reece, mason	£1,200	0	0
J. Briggs, joiner	255	0	0
T. Perry, plumber	200	0	0
J. Smithies, slater	171	5	0
J. Throp, plasterer	72	0	0
Varley & Roebuck, painter	48	10	0

#### CWMPENNAR.

For Additions to Cwmpennar Schools, Mountain Ash.

J. MORGAN (accepted)	£410	0	0
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#### DEVIZES.

For Erection of Steam Factory, for the North Wilts Dairy Company, Devizes. Mr. J. A. RANDALL, Architect.

G. Brown, Devizes	£960	0	0
R. B. MULLINGS, Devizes (accepted)	955	0	0

#### ELHAM.

For Alterations at Workhouse, Elham.

##### No. 1.

J. Scott, Hythe	£113	0	0
Amos, Hythe	110	0	0
Maycock, Hythe	108	0	0
F. File, Elham	107	12	9
J. Unwin, Folkestone	98	14	0
Wallis & Son, Maidstone	91	0	0
Webster, Folkestone	88	0	0
W. HOLDOM, Folkestone (accepted)	85	10	0
Petts & Son, Folkestone	81	5	0
Franklin, Folkestone	69	0	0

##### No. 2.

Maycock, Hythe	190	0	0
J. Unwin, Folkestone	188	5	0
F. File, Elham	175	10	6
Franklin, Folkestone	169	0	0
J. Scott, Hythe	141	0	0
Wallis & Son, Maidstone	139	0	0
Amos, Hythe	135	0	0
Webster, Folkestone	129	0	0
Petts & Son, Folkestone	128	14	0
W. HOLDOM, Folkestone (accepted)	87	10	0

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No. 3.

Maycock, Hythe . . . . .	£10 0 0
Webster, Folkestone . . . . .	8 10 0
F. File, Elham . . . . .	7 19 10
J. Unwin, Folkestone . . . . .	7 15 0
W. HOLDOM, Folkestone (accepted) . . . . .	7 15 0
Amos, Hythe . . . . .	6 5 0
Franklin, Folkestone . . . . .	5 0 0
Wallis & Son, Maidstone . . . . .	5 0 0
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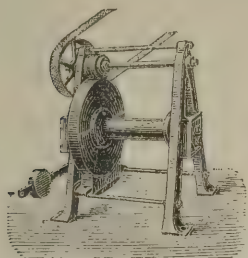
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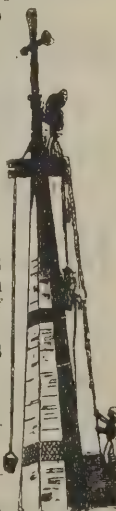
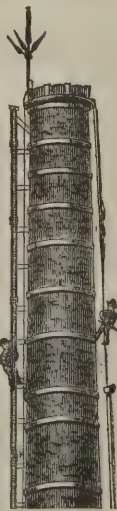
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AT a town's meeting at Burnley on Tuesday evening it was decided to promote a Bill for the extension of the borough, and obtain powers to expend 30,000l. on local gasworks and other improvements.

SEVENTEEN tenders were received for heating the Hornsey Local Board Isolation Hospital, and that of Mr. George Jennings, of Stangate, Lambeth, has been accepted for a total of 380l. No decision has, however, been arrived at with regard to the tenders for heating the Board's offices.

ON Monday evening the first instalment of the improvements now being carried out in connection with the electric lighting system were used in Leamington. Arc lights, ranging from 300 down to 50 candle-power are placed at intervals along the Parade, giving a good light, but their brilliancy detracts from the power of the ordinary electric lights.

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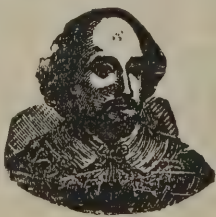
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AN inquiry has been held at Eccles as to the application of the Barton and Eccles Local Board for sanction to borrow 10,170*l.* for works of private street improvement, and 250*l.* for the erection of sheds, store-room, and boundary wall at the town hall.

### THE IRONWONGERS' EXHIBITION.

A VERY fair number of exhibits are collected in the above Exhibition at the Agricultural Hall, and many well-known firms are represented. We notice a particularly good show of wrought-iron work, and amongst other firms are Messrs. Edgar Keeling, Teale & Co., of Elm Street, Gray's Inn Road, who show a variety of chandeliers, candelabras, grills, &c., nearly all reproductions of designs previously executed. That excellent finish which is the conspicuous feature of English wrought-iron work is well illustrated by this firm; the designs are charming and novel.

English smith's art is conspicuous at the modest but tasteful stand of Messrs. T. F. Pinnock & Co., and their exhibits show that they are quite cognisant of the sympathetic nature of their material. The heavy work on view, in the shape of two pilasters, is a good instance of clean forging and fitting in the working out of an excellent design. The general effect of this work is, no doubt, produced by the care given to the "sizing" of the iron, a most important feature in the production of a taking effect for the eye. Messrs. T. F. Pinnock have erected a forge at the Exhibition, and workmen are engaged in making the wrought-iron work in all its branches.

Messrs. Kaye & Sons exhibit their well-known push-and-pull system of works, and show its application to theatre exits. The Royal Music Hall and the Court Theatre have adopted it; and we think it has no superior in the market.

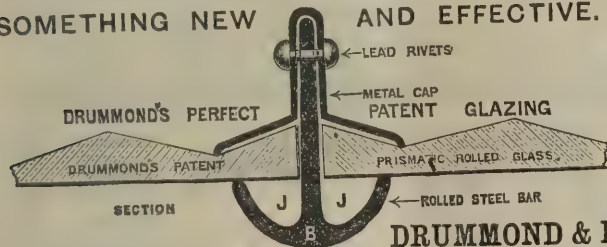
Messrs. Darby & Co., Limited, Caledonian Road, exhibit a new method of heating by means of oil and water, which we shall refer to in a subsequent issue. Mr. Robert Adams exhibits his well-known "Victor" door spring, which is so favourably known. The Atkinson gas engine deserves special mention for economy and efficiency. Prominent amongst the lighting firms represented are Messrs. Siemens, with their regenerative gas lamps, of which system they are the originators. The Blackwall Galvanised Iron Company, Limited, Corbet Court,

Gracechurch Street, introduce a speciality consisting of pedestals made of corrugated iron in exact imitation of majolica and marble of every colour. So striking is the resemblance that the firm find it necessary to inform visitors in a printed notice that these productions are not marble. The Scandinavian Stove Company, of 47 Shaftesbury Avenue, exhibit their patent Scandinavian stove—an improvement which should interest those who advocate smoke abatement, for it is practically smokeless.

Mr. F. Benson, of 59 Upper Street, and Highbury Iron-works, Station Road, makes an extensive show of the various kinds of iron wine bins manufactured by him. The French pattern bin, being made in sizes to hold from one dozen and upwards, struck us as being the kind best adapted to the use of those whose houses have not been arranged with cellar accommodation, or those who go in for varieties in their vinous consumption, inasmuch as every bottle has a separate rest, and can be taken out without disturbing the others. They are also made with doors to lock up, so that a wine bin can be placed in any part of the premises with perfect security. Altogether, we conclude that these bins, from their great usefulness and portability, ought to form a very necessary adjunct to the ordinary stock of a furnishing ironmonger, their price being so low as to place them within the reach of every consumer. The next thing that we notice is what are termed wrought-iron bins. These are formed by partitions having crossbars at intervals, on which the shelves, composed of strong plates of sheet-iron, supported by bearers of T-iron, rest. These shelves are removable at will. In these bins the lathe is used in turning. The great features of these bins are the saving of space, the ease with which they can be fixed or removed if required. These appear to us to recommend themselves strongly to architects, builders, &c., for use in mansions, clubs, hotels, and wine merchants'. Mr. Benson seems to have made this business a speciality, having been in it since 1862—therefore competent from his long experience to give the best advice to those charged with the arrangement and fitting up of wine cellars.

Mr. Frederick Betts, of 31 and 33 York Street, London Road, has a fine show of marble mantelpieces, tiled grates, overmantels, &c., at stand No. 17, and also a newly-designed cooking range, the "Grecian," which we illustrate. It is specially prepared for the London market, being strong, well finished, and very low in price, and already several large contracts have been secured for the New Year. This range can

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Country Houses Fitted Complete. Town Residences Wired and Fitted for the current of the London Electric Supply Company or other central stations. Electric Light Fittings as supplied to most of the First Houses in England. Show Rooms Illuminated all day with the Electric Light. The THOMSON-HOUSTON SYSTEM as in use at St. Pancras Station, the Italian Exhibition, Woolwich Arsenal, &c.

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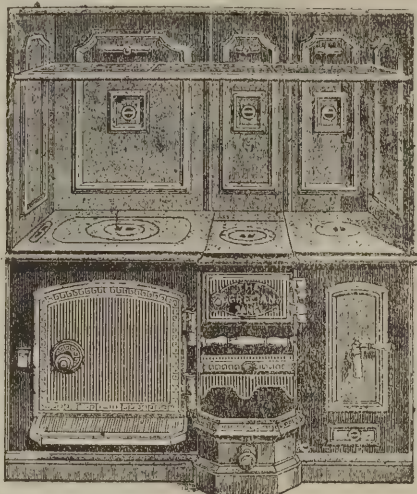
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be fitted with open fire arrangements of almost any pattern. Besides being economical in fuel, it is thoroughly strong and durable, and handsome in appearance. Mr. Frederick Betts has an extensive stock of marble and enamelled slate chimney-



pieces, tiled grates and hearths at his show-rooms at the above address, where he has one of the largest stocks in London.

Messrs. W. Höffler & Co., of Basinghall Street, E.C., have a representative exhibit at the Ironmongers' Exhibition of their beautiful artistic wrought-iron work. A reference to the sample books of the firm will further show the marvellous power of designing possessed by the firm, in the unlimited variety of charming articles delineated. The same articles are repeated again and again, no two alike, the variety in design being pushed far beyond what one would have thought possible in the staff of a single house of business. Every use that ornamental metalwork can serve has apparently been consulted. In addition to the application to artificial lighting of every kind, including table-lamps, hall-lamps, &c., are numberless objects to serve the most varied of useful and ornamental purposes. Where all is excellent, it would be hard to pick out individual articles for praise above any of the rest.

#### THE ROYAL SCOTTISH SOCIETY OF ARTS.

THE committee of the Royal Scottish Society of Arts have issued a report on the communications laid before the Society during the session 1887-1888. The committee state they have awarded the following prizes:—The Keith prize, value thirty sovereigns, to James Hart Robertson, Rochester, America, for his paper on "The Writing Telegraph;" a Brisbane prize, value twelve sovereigns, to D. William Kemp, J.P., John Kirkwood, and James Kirkwood, for "Improvements in shaping ductile metals to form concave, indented, or hollow articles, by the direct application of fluid pressure;" a Hepburn prize, value ten sovereigns, to William Ireland, Buckhaven, for his "New machine for making loops, ossels, or snoods for fishing nets, fishing lines, and other purposes;" and a Reid and Auld prize, value three sovereigns, to William Sturrock, watchmaker, 12 St. Andrew Square, Edinburgh, for his paper "On an electric illuminated time indicator." The committee award a complimentary Keith medal to Alan Brebner, M.Inst.C.E., for his paper on "Modern Harbour Construction;" a complimentary Brisbane medal to William Dyce Cay, M.Inst.C.E., for his paper "On the construction of marine works with concrete bags, and on the plant for their deposit;" a complimentary Hepburn medal to John Reid Rosemont, for his paper "On hydraulic hoists with suggestions for improved structure in the apparatus, and greater economy in the employment of hydraulic power for lifting apparatus with variable loads;" a complimentary Hepburn medal to R. Hedger Wallace, M.R.A.S.E., for his paper on "Agricultural Education;" and a complimentary Keith medal to J. W. Inglis, F.R.S.E., M.Inst.C.E., for his paper "On plantations producing fuel and timber for building purposes, in Bengal and Burma." The special thanks of the Society are also given to the president, Mr. Bruce Peebles, F.R.S.E., for his opening address; to Dr. Sang, for papers; and to Mr. R. Norman Shaw, R.A., London, for his paper on "Patent drain-pipes."

#### BUILDING IN LEEDS.

THE report of the inspector of buildings to the Building Clauses Committee of the Leeds Corporation, for the year ending August 31, gives the following statistics on building:—Total number of plans, 1,847; number of plans approved, 1,480; number of plans rejected, 299; number of buildings (including houses), 5,348; number of buildings approved,

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4,612; number of buildings rejected, 736. The 2,058 houses shown upon the 360 plans approved, include—14 villas, 8 semi-detached villas, 620 through houses, and 1,416 back-to-back houses. The 31 miscellaneous plans were for 2 churches, 1 addition to church, 1 chapel, 1 addition to chapel, 7 mission-rooms, 1 addition to mission-room, 6 schools, 6 additions to schools, 3 clubs, 1 savings bank, 1 music-hall, and 1 arcade. During the present year 1,723 houses have been completed and certified for occupation, including 6 villas, 13 semi-detached villas, 620 through houses, and 1,084 back-to-back houses. 586 miscellaneous buildings, and 867 privies and ashpits, waterclosets, trough-closets, and dry ashpits, have been completed and certified. Two informations have been laid before the stipendiary magistrate for infringement of the laws, convictions being obtained in each case, with fines amounting to 3/.

#### THE METROPOLITAN BOARD OF WORKS.

THE *Times* says the Commissioners have unfolded an interesting and remarkable history, which should at least prove useful in directing the attention of the new County Councils to some of the methods in which corrupt officials may obtain profit by sacrificing the interests which it is their duty to protect. It is evident from the whole of the report that the members of the Board of Works, of whom the great majority are definitely acquitted of all suspicion of wrong-doing, did, nevertheless, conduct their business in a manner which afforded exceptional facilities for dishonesty.

The *Daily Telegraph* does not approve of the very mild manner in which Lord Herschell speaks of the moribund Board. It says:—"They entrusted the questions of purchases and contracts, not to a small and responsible body, composed of their best men, but to all the members sitting as a private committee, and not as a public board. At these sittings any member could attend and any member could be absent. Consequently the architects who were on the Board made it their business to attend when questions in which their clients were concerned came on for adjudication, and their unprofessional colleagues accepted, of course, the advice of men whom they regarded as disinterested experts, when, in fact, they were interested parties to the contract. Now this system all round presupposes on the part of the Board either an absolute imbecility if they did not perceive the facilities for fraud they were making, or a general, if not a particular, knowledge of the corrupt transactions carried

on. The blame must, no doubt, be divided. There were honest members of the Board who had no suspicion whatever of the tricks played by the clerks in the surveyors' office and by the outside architects; but then, men so utterly blind to what was going on around them are unfit for any public position whatever; they would be incompetent members of a village vestry. With regard to the keener members of the Board, who could shrewdly guess why their professional colleagues said "Yes" or "No," it is obvious that, though not paid in cash, they were otherwise considered. How could they be harsh to friends with whom, perhaps, they had dined the night before?"

"We now see," adds the same journal, "what was inside that whitewashed sepulchre, the Board of Works. The vestries are notoriously incompetent and corrupt, as the state of the slums attests. It will be the same with the London County Council if public opinion does not keep a sharp eye on this new local parliament. Unless high-minded men of leisure and ability come forward as candidates, we shall have a new horde of hungry vestrymen pushing themselves to the front, eager for free lunches, secret bribery, and indirect pickings of all kinds."

The *Standard* says the interim report of the Board of Works is a disappointing document. The ample powers conferred on the Commission to discover the truth seem to be dissociated from the vigour necessary to enforce the proper lessons. One reflection naturally excited by a perusal of the apologetic paragraphs is, that if a body on which no general censure is pronounced could give rise to such scandals, what might be expected of a representative body really and intrinsically bad? The Metropolitan Board has done great and excellent work, for which it is entitled to lasting credit, and yet its career is marked by defects and transgressions of so serious a nature as to invite the most emphatic disapproval. Its relations with music-halls, theatres, and public-houses have been singularly unfortunate, and have given rise to abuses at which the Royal Commissioners are amazed, though their good opinion of the Board survives it all. Two or three officers and two members are marked out as the actual offenders; but beyond these individual cases the Commissioners find nothing amiss, except, it may be, that some part of the organisation was not so well adapted for the proper execution of public business as it might have been. In short, the public are very much indebted to the Commissioners for the facts they have elicited, but owe them small thanks for the conclusions which they have founded upon them. The forty pages of the Report furnish a most painful

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46 Cannon Street, London, E.C.,

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**DURESCO:** The Patent Washable Distemper.

The manufacture of this article has been greatly improved. All old defects have been overcome. Duresco is now the most artistic and economical decorative medium for inside work, and the most durable agent for outside use in the market.

**ENAMEL PAINT.** The Original Makers.

Glossy, durable, quick drying, one coat equal to two of ordinary paint. Suitable for all climates.

**SILICATE PAINTS,** Varnishes, Ready Mixed Paints,  
In self-opening tins, &c., &c.

APPLY FOR SAMPLE CARDS AND DESCRIPTIVE CIRCULARS.



*exposé* of scandalous practices carried on over a series of years, and perpetrated with an impunity which could scarcely have been greater had the entire body sanctioned and supported them.

The *Daily News* says:—"There seems to be no evidence that the members of the Metropolitan Board have been themselves corrupt, though some of them get justly and severely rebuked, but they were blind to the corruption which was going on all round them, and were little more than mere servants of their own servants."

The *Globe* considers the report is the sort of document which unprejudiced readers of the evidence were prepared for, and that any expectation which may have been cherished of a sweeping condemnation of the Board either for incompetence or neglect of duty, still more for dishonesty, will be grievously disappointed. It says:—"The people of London may be assured, as the result of a most stringent and certainly not benevolently neutral inquiry, that the splendid works which have improved the metropolis almost out of recognition have not, except in very few instances indeed, been the occasion of anything which can be called jobbery or waste. It would be odd if the experience of thirty years did not suggest some lessons for the future, and the proposals of the Commission that the principle of the Corrupt Practices Act may be applied to transactions between public bodies and outsiders will probably receive general approval."

#### RAILWAY CONSTRUCTION IN JAPAN.

FROM the report of the Japanese Railway Bureau for the past year, which has just appeared, it would seem that, rapidly as it is progressing, railway construction in that country has to meet unusual difficulties, or rather, an unusual number of difficulties, owing to the physical geography of Japan. One line of 205 miles in length involves the construction of sixteen tunnels, 16,000 feet long, and the bridging of eleven rivers. One of these had a velocity in time of flood of 27 feet per second, and in another the brick piers have to be sunk to a depth of 80 feet. A range of mountains is crossed at a height of 1,468 feet. Part of another line ascends to a height of 3,144 feet, and during five months of the year work is rendered impossible by the snow, and sometimes in the summer months an epidemic of cholera has the same effect.

#### FALL OF NEW HOUSE.

ON last Friday afternoon a house which formed the corner of a new row of shops and houses in Great Titchfield Street, suddenly collapsed, when six men were killed and several were injured. For some months past a row of buildings in Great Titchfield Street, Oxford Street, has been undergoing rebuilding by the firm of Oldrey & Son, Kensal Road, Paddington. The buildings erected are substantial three-storey structures of yellow brick faced with freestone, and intended as shops with dwelling-houses above. The last of the set to be completed was that standing on a site formerly occupied by the Queen's Head public-house, with a frontage to Great Titchfield Street, and a wing on Riding House Street, a narrow thoroughfare running parallel to Oxford Street. The building had been roofed over, and on Friday afternoon upwards of twenty workmen—bricklayers, carpenters, painters, and their labourers—were at work on the premises. At about ten minutes to four o'clock the attention of the people in the adjoining shops and houses was attracted by a loud rumbling noise, described by a spectator as similar to several carts emptying loads of stones or bricks, and the air around the new building was obscured by a cloud of dust. When this had cleared away partially, it was seen that the structure was now a shapeless mass of broken timber, woodwork, and dismembered fragments of brick walls. The thoroughfare is so narrow that some of the shop fronts opposite were marked by portions of the falling débris. The inquest began on Tuesday before Dr. Thomas.

Mr. Montague Tench, one of the medical officers of the Middlesex Hospital, deposed that the deceased, Alexander Wain, had died in the hospital, sixteen hours after admission, from internal injuries.

John Clements Richards, general foreman to Messrs. Oldrey & Co., builders, said that the old buildings at the corner of Titchfield Street and Riding House Lane were entirely pulled down, and the new buildings were chiefly composed of bricks, stone, and iron. They commenced the work of rebuilding about nine weeks ago. They had thirty-two men employed on the works, which were to be completed within a given time. The work comprised two houses, 53 and 55 Titchfield Street, but that to be reinstated was only one house, and the one that fell was No. 53. They had completed the house as far as the construction went, and they carried out the work under

# FIRE! FIRE! FIRE!

## GRIFFITHS' "PYRODENE" FIREPROOFING LIQUID

(NON-POISONOUS).

Transparent Liquid for Rendering Woodwork Uninflammable,

Without altering its appearance, and where Painting is not desired, such as Wooden Fittings in Exhibitions, Churches, Pews, Matchboarding, Theatre Scenes, Wooden Stairs, Joists, Beams, Floors, Factories, Stables, Mills, &c., in fact, Structures of an inflammable nature of all descriptions. Acts as a priming for new Woodwork for Paint or Varnish. Also for rendering Theatrical and Ball Dresses, Curtains, Paper, Felt, Canvas, &c., perfectly uninflammable.

Griffiths' Liquid penetrates the pores of the wood. It lasts as long as the wood itself. It prevents Dry Rot and decay in house timbers. It does not crack, peel, or rub off.

It is perfectly innocuous and free from smell. It will keep any length of time. Any one can apply it.

One gallon will cover double that of any other priming.

AND

All Woodwork in new houses should be fireproofed with this liquid, the cost is so trifling in comparison with the preservation of the timber and freedom from risk of fire. If work is desired to be painted afterwards, Griffiths' Pyrodene Paint is best for the purpose.

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ALL COLOURS.

This Paint is manufactured for preservative and decorative purposes equally as for its FIRE-RESISTING qualities. The Fireproof Paint and Fireproofing Liquid is used at some of the principal Theatres in the United Kingdom.

#### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIRS.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 39 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIRS.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly, S. C. LOWE & SON.

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the supervision of an architect, Mr. Miller, and he considered the whole of the work was proceeding very satisfactorily. On Friday morning he was on the works, and he noticed nothing dangerous. Ironwork was used in the building, and the materials generally were good and sound. The roof was put on to the house 55 about a quarter to four on Friday afternoon. Witness continued:—I was in No. 55, in my office, when a clerk came to speak to me, and said I was wanted. On going out of the door, with the intention of going up to the roof of 53, I heard a rumbling noise, and thought that it might be that the large tank on the top scaffolding might have fallen. The bricks and the mortar and all the materials were good, but we had a great deal of wet weather. When the building fell I was at the door of 55. I could not tell the cause of the collapse. The works were being carried out under the supervision of the architect, who acted also as clerk of the works, and they were carried out in accordance with the specifications he had drawn. I could not form any opinion as to the cause of the accident. The district surveyor visited and inspected the works, I should think, about once a week. I believe I have seen him there seven or eight times. The witness, in a severe cross-examination, stated that the house had a foundation of 3 feet of concrete, and it was bound by girders to the adjacent houses in Riding House Lane. The mortar was properly mixed with lime and sand. The materials were good. He worked from the architect's specifications and not from any ideas of his own. He did not consider that the mortar was of such an inferior character that on being pressed in the fingers it crumbled like dirt. Mr. Miller, the architect, had a clerk named Freeman. He might have been more frequently there than Mr. Miller himself. The party wall of the adjacent house in Riding House Lane was underpinned before the footings of the new buildings were put in.

George Winter, a bricklayer, said he had been working on the fallen premises for a month or six weeks. He understood the character of mortar. That used in this building was good mortar. He neither heard of nor saw anything wrong in the construction of the building. At the time of the fall of the building he was at work at the top of the house 53, at a chimney. The house suddenly collapsed, and he came down with the chimney to the bottom. He was but very slightly injured. The whole place seemed to collapse in a moment. He could give no explanation whatever as to the cause of the collapse. He heard no complaint or remark whatever among the men as to the character of the building. He had been for

fifteen years a bricklayer, and would know if the materials were good or bad. He looked upon the building materials at this place as good. He had no idea of how this occurrence took place.

Thomas Robinson, a cheesemonger, residing in Great Titchfield Street, said he was looking out of his window at the time of the fall. He had watched the building day by day, and on Friday afternoon it seemed as if it was nearly finished, when all at once it gave a sort of quiver and suddenly collapsed. In less than a minute the entire building fell. All the men were at work, and when he saw what had happened he rushed down stairs and sent his sons for cabs to take the poor fellows away to the hospital. He was not a builder, but he thought it must have been one of the girders gave way. A police-constable and some other witnesses having given evidence as to seeing the building suddenly collapse, but without being able to give any evidence as to the cause,

The Coroner said he should adjourn the inquiry and have the plan, the specification, and the debris of the building practically and professionally examined with a view, if possible, to arrive at the conclusion as to the real cause of the accident. He pointed out, however, that the magistrates made no allowance for such a purpose, and he had on previous occasions to pay for this professional aid out of his own pocket. On this occasion, however, he was pleased to say that a professional gentleman, Mr. Collins, had kindly undertaken to perform the duty without remuneration.

The inquiry was ultimately adjourned till the 28th inst.

#### BIRMINGHAM MASTER BUILDERS' ASSOCIATION.

THE annual meeting of the Birmingham Master Builders Association was held on Monday night, at the Great Western Hotel, Mr. A. S. Smith (president) in the chair. The annual report stated that the committee were glad to report an improvement in trade generally, and hoped that it would be permanent, and eventually extend to the building trade of the town. The committee had again felt it their duty during the year to call the attention of architects to the unfairness of requiring builders to verify the accuracy of quantities supplied; and upon doing so had been fairly met. In connection with this matter, the committee were pleased to be able to report a growing inclination on the part of architects to use the contract

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## THIRD YEAR OF ISSUE. THE ARCHITECTS', SURVEYORS', AND ENGINEERS' COMPENDIUM, AND COMPLETE CATALOGUE.

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### IMPORTANT NOTICE.

The next issue will contain a **DICTIONARY OF MANUFACTURERS' SPECIALTIES**, and the Editors will be pleased to receive particulars or catalogues of goods, with the leading specialties marked. Names of approved specialties are inserted **WITHOUT CHARGE**. The special feature of the work is **THE COMPLETE CATALOGUE**, in which detailed and priced particulars of goods, with each article indexed, are brought together and classified for the reference of Architects, Contractors, and others.

### TESTIMONY OF MANUFACTURERS.

**NOTE.**—Of the Firms who have already taken space, **Seventy** have ordered from 1 to 8 pages and upwards each, and the following and others have taken greatly increased space:—

D. Bostel, 1 page (increase from  $\frac{1}{2}$  page).  
Broad & Co., 8 pages (increase from 1 page).  
Burt & Potts, 2 pages (increase from  $\frac{1}{2}$  page).  
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Maw & Co., 2 pages (increase from  $\frac{1}{2}$  page).  
Richardson, Ellison & Co., 2 pages (increase from  $\frac{1}{2}$  page in first and 1 page in second issue).  
S. Saunders, 1 page (increase from  $\frac{1}{2}$  page).

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### SPECIMEN OPINION OF ARCHITECTS.

R. Norman Shaw, Esq., R.A., &c., writes:—"I am quite certain it would be of the greatest value, and secure universal support. Manufacturers' Catalogues are of very little use, and go freely into the waste-paper basket, as they are so numerous that it would be impossible to keep them, and unless kept systematically they would be of no use. At least, I know when I set to work to find a name or address I rarely succeed."

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forms which had been approved by the Royal Institute of British Architects, and the National Association of Master Builders. A copy of this form of contract had during the year been sent to each member of the Association, and its adoption was strongly urged. The balance-sheet showed total receipts for the year 81*l.* 9*s.* 7*d.*, which, with the balance from last year, 14*l.* 8*s.* 4*d.*, made a total of 95*l.* 17*s.* 11*d.*; and the various disbursements amounted to 83*l.* 14*s.*, leaving a sum of 12*l.* 3*s.* 11*d.* to the credit of the Association. The report having been approved, Mr. Bowen moved, and Mr. C. H. Barnsley seconded, the re-election of Mr. Smith as president. In reply, the President said that he was deeply indebted to Mr. Bowen and Mr. Barnsley for the services they had rendered to the Association during the year, in consequence of his own illness. The thanks of the Association were due to the gentlemen named. On the motion of the President, seconded by Mr. A. Smith, Mr. C. H. Barnsley was elected vice-president. The treasurer, Mr. W. J. Whittall, was re-elected, as were also Messrs. Barnsley and Sapcote as auditors. The Secretary drew attention to the question of the proposed reduced subscription to the National Association of Master Builders, and pointed out that it was a matter left over from the last meeting. He did not know whether it was intended to proceed with the question. Mr. Bowen said that the National Association carried out its work as economically as possible compatible with efficiency, and he recommended that the matter should pass by at least for another year. Mr. Barnsley considered that if the matter were left in the hands of the committee it would be satisfactorily arranged. The matter then dropped, and the proceedings terminated.

The members subsequently dined together, under the presidency of Mr. A. S. Smith. The loyal toasts having been honoured, Mr. C. H. Barnsley proposed "The Town and Trade of Birmingham." Councillor Barclay, in reply, briefly touched on the progress of the town during the last twenty-five years. He hoped that the improvement which had been felt in several trades would extend to the building trades. The President proposed "Success to the Birmingham Master Builders' Association," and said that in the past the Association had rendered valuable services to its members. Although there was a lull at the present, there might again come a time when its services would be of value of the highest importance. It always looked after the well-being of the members. Mr. Doubleday responded, and contrasted the appearance and importance of the town 300 years ago with that of the present time. The pro-

gress of the last fifty years had been most marvellous, and the buildings which had been erected in the town bore evidence of the progress of the times. Mr. Sapcote proposed "The National Association of Master Builders of Great Britain," coupled with the name of Mr. J. Bowen. The latter, in reply, dwelt on the importance of fidelity to the Central Association, by which means, he contended, the local builders would derive not only benefit to themselves, but would command the congratulations of the town. Several other toasts were proposed during the evening.

### THE STREET ARCHITECTURE OF MANCHESTER.

AN important discussion (according to the *Manchester City News*) on the subject of the street architecture of Manchester took place about a fortnight ago at a meeting of members of the Arts Club, at the Club Room, Albert Square. Mr. J. H. Nodal presided, and amongst others present (in addition to those who spoke) were Messrs. Hermann Magnus, William Mosley, Alfred Kendal, Colonel Rogers, Thomas Black, T. H. McCormick, W. W. Page, William Dawes, S. C. Cawthra, Charles J. Maycock, W. Wareing Faulder, and J. Buchmann. Letters were read from several gentlemen who were unable to attend the meeting. One was from Lord Egerton of Tatton, who, the Chairman remarked, had a peculiar right to speak upon this matter, not only by reason of his knowledge of the city, but on account of his almost professional experience, he having gone the curriculum of an architect's office. Lord Egerton wrote:—"I shall be very glad to consider how the street architecture of Manchester might be improved. I consider the city itself an hopeless case, but I shall be very glad to support any movement to improve the suburban architecture of Manchester." Mr. W. A. Royle, chairman of the Manchester Society of Architects, wrote:—"I am quite satisfied that a subject of such importance to every individual whose lot is to spend a large proportion of his existence in this unlovely city will be ably discussed, and I hope the result of the meeting will be to initiate a scheme which if adopted would have the effect of preventing any further disfigurement of our streets." Mr. Thomas Worthington and Councillor J. H. Andrews also wrote expressing their regret that they were unable to attend, and their deep interest in the subject set down for discussion.

The Chairman said the subject for consideration that

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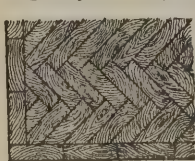
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evening was a somewhat novel one. No meeting of the kind had ever been held in Manchester before, and, so far as he knew, no public meeting had ever taken place in any town in the kingdom to deal with the question of street architecture and its improvement. Consequently there were no precedents to guide them; they were sailing, as it were, into an unexplored sea. It was true that in Manchester we had at times had discussions in the newspapers, and one last year, begun by Mr. Robert Falkner, attracted a large amount of public attention. Unfortunately, like most questions introduced in newspapers, unless backed by an outside movement, the results were nil. We had also in this city two architectural societies, and it was quite possible, and indeed probable, that the members had discussed the subject frequently, but as their proceedings were confined to themselves, they had no influence upon the outside public. The great point of course was to create a public interest in the subject, and, when that was done, no doubt architects would give every aid possible.

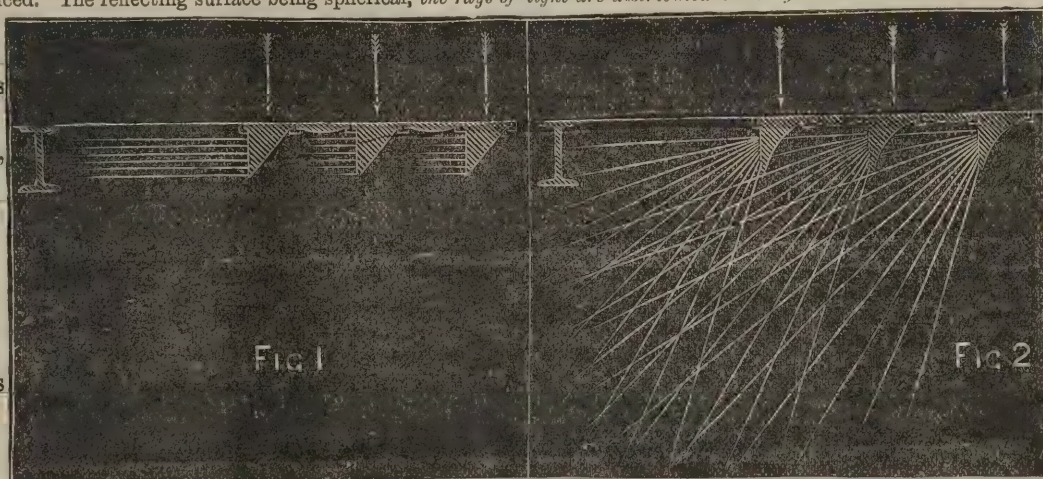
Mr. Alfred Darbyshire was called upon to open the discussion. He did not propose, he said, to take up the time of the meeting by discussing what might be called the absurdities which characterised the Georgian era; but he thought they might take some notice of the period which followed it—that of revived Classicism in Manchester. He remembered the existence of an architect who did almost the whole of that work, whose name was Richard Lane, who had been educated in the ultra-Classical school, and who was in fact a student of Greek art and Greek architecture. He could not believe in anything else, and the consequence was he perpetuated many of the Classical abominations in Manchester which unfortunately were so bulky, so heavy, and so costly that they had never yet been removed. The golden age of Pericles still stood out as marking the acme of architecture and sculpture and of art, and therefore in calling these things Classical abominations he (Mr. Darbyshire) was not for one moment wishing to derogate from the beauty and utility of the architecture of the Acropolis of Athens. It was with regard to the misapprehension of the objects of that art and its misappropriation in the streets of Manchester that he wished to say a few words, and which he thought had caused a vast amount of ugliness and unloveliness. He did not know whether it had struck his hearers as it had struck him to ask what had a Greek temple to do with an infirmary, a Quaker's meeting-house, or a concert-hall. It seemed only about a quarter of a century ago that another man arose in Man-

chester, whose name was Edward Walters. He had also had a classical education, but his proclivity fell upon the Italian lines, and they had those beautiful edifices—many of them Manchester warehouses—all built upon the Italian model, and certainly built by a man who knew what he was doing, and who was a perfect master of Italian architecture. He need not enumerate many examples. The Free Trade Hall, of course, was his last and greatest work, upon which Walters expended years of thought. Then they came to the men of our own time, among them Mr. Worthington and Mr. Waterhouse and others, who introduced another phase of art, a good deal of which was beautiful and appropriate; but there was again another stage which had no style and no art about it, so far as he (Mr. Darbyshire) could judge. There was a utilitarian spirit through the whole of the city which prevented in some way or other the realisation of beautiful works of architecture or other street adornment. It seemed to him that the unloveliness of Manchester might be put under a few short heads. The first was bad architecture and worse sculpture: then they had utilitarianism, then misappropriation of site, and then they came to something outside architecture in the way of street advertising, overhead wires, and authoritative restrictions, the smoke nuisance, want of colour and light and shade. If they took bad architecture, they came first to the great building in Piccadilly, and which they knew as the Infirmary. The history of that building was most singular. Originally it was a plain brick building, with a lot of square holes knocked out for light. Then Mr. Lane came and faced it with ashlar, making it look as respectable as he could, and putting a big portico in front, which made the patients' rooms dark, dreary, and miserable. Thinking that was not sufficient, Mr. Lane added a little dome, which was so small and insignificant as to present a decidedly puerile appearance. What had followed? All round the site, in every direction, they saw huge piles of white brick, with certainly nothing but holes knocked out for light, objectionable buildings were placed against the Classical front, and altogether he thought there never was such an unfortunate jumble in any town in the country. He did not know whether a golden age in art would ever come to this country, but if it did the men of that day, he ventured to say, would look with amazement at the waste and spoliation on that site, and wonder what order of men they were that lived in the nineteenth century. He singled this out as one example of the perpetuation of ugliness. Then as to utilitarianism. In the erection of large retail shops they

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seemed to have reached an age of glass and iron, of large piles of superstructure resting apparently on plate glass. So long as they could get the means of displaying the goods and accommodation for customers, the front of the buildings and the effects upon the streets were never for once considered. That was what he called an absolute triumph of utilitarianism. Misappropriation of site seemed to him to be an important point to look at. In Piccadilly they had a grand site, but he asked whether the best had been done with that site. The Town Hall was another example. He held that there had been want of judgment on the part of those who settled where that building should be, inasmuch as they had given the architect one of the most awkward problems to solve in giving him a site like a flat-iron to work upon. As a consequence, thousands of pounds had been thrown away, and the architect had been cramped and had not been able to produce the result which the citizens were entitled to expect when they built their grand municipal hall. It seemed to him also that science in these days had played a great part in the ruin of street architecture and street art. They could stick up as many advertisements and ugly flaming placards all over their buildings as they thought fit. They could cover their town with a network of wires and erect excrescences which destroyed the outline of any buildings they might attempt to put up. In fact, there had been no attempt on the part of any authority to guide the hands of the men who had to provide the future architecture of Manchester. As to the sculpture of Manchester, perhaps the least said the better. Sculpture was, perhaps, not a strong point in the streets of any city in this country, but in Manchester, he thought, they had been peculiarly unsuccessful in this respect. He did not think any continental town would tolerate, for instance, the statue of Cromwell, which stood near to the Cathedral. The authority that would allow those four miserable, horrible lamps at the corner of the pedestal of that statue to remain all this time was to blame. There was a case calling for redress and for some body in the city to regulate these things. They had a statue of their late worthy Bishop in Albert Square, and it was an honour to the city that there should be a statue to a Bishop, but it was a misfortune that such a statue should be completely thrown away. He (Mr. Darbyshire) was open to correction, but he would not have allowed the Bishop to stand outside with his hat off. He would have surrounded him or have associated him in some way with that ecclesiastical architecture which was a part of his existence. He would not have put his back to the principal square and compelled

people to walk all round to see the name of the Bishop on the back of the pedestal. These things showed the want of some regulating authority. We were sadly handicapped in England, and in this city especially, by the climate. It seemed to him a vital principle that science should attempt in some way or other to get rid of the vitiating influences to which street architecture was subjected here. He did not despair. He had hopes that a better day would dawn. He supposed they must all admit that loveliness in their streets was of great importance to the poetry of life, and he hoped some action would be taken by which the future of the Manchester streets and their architecture might be regulated. He did not think he could even suggest what should be done; but as long as we had a corporate body to govern the city, that body ought not only to take cognisance of the sanitary state of the life of the citizens, but it ought—either by an individual who knew all about the subject or by a well-constituted and able body of men—to strive, if not to produce loveliness, to prevent ugliness. If that club could give expression to some practical opinion which could go before the civic authority, he could not see why we could not, as they did in the grand old Italian cities, have a man or men who should have the power to say that people who built shops, or warehouses, or anything else, should not build that which was ugly. He did not ask that men should spend money in making things gorgeous, but he asked that the lines and the colour should be good, and that the buildings should be good in other respects. It was as easy and as cheap to produce a beautiful thing as an ugly one, and this was a principle that should not be lost sight of.

Mr. John Farrell said he thought it was as well that non-professional views on the subject should be heard after the eloquent disquisition they had had from Mr. Darbyshire. The only suggestion that seemed to come from Mr. Darbyshire's remarks was the absolute sweeping away of every architectural feature in Manchester. There was scarcely one of the things he admired in Manchester in the way of street architecture that Mr. Darbyshire had not condemned, and very likely given good reasons for condemning. He (Mr. Farrell), however, thought that the architects were not so much to blame. In Manchester they were very seriously handicapped. He did not care whether the buildings were of Greek origin or Italian, or whether the outside suited the inside—the general effect was the only thing they need think about in considering the question. If street architecture was to be of any value at all it should act in the direction of elevating the public taste. There were in Man-

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chester numbers of exquisite buildings. His complaint was, and it was a complaint against the Corporation directly, that those magnificent buildings were absolutely spoiled by the want of ordinary supervision and ordinary care, and given a character of unloveliness which was common to every one of them. He referred to the point which Mr. Darbyshire himself mentioned—those abominable hoardings which were put about all the principal streets, and which had the effect of destroying any beauty that architects might succeed in providing for the people, and on which capitalists never ceased to spend their money. We had at the bottom of Market Street one of the finest buildings in England, the Victoria Buildings, the work of a member of that club. Of that building Manchester had great reason to be proud, but right in front of it was one of those staring hoardings for beastly placards, and the Corporation made no effort whatever to stop that system of mural advertising. A man put up a house, and spent a lot of money upon it; another man put up a second house within twenty yards, and both these houses were occupied; but there was an intervening space, enough to build a third house upon, of which the mural advertisers—those creators of unloveliness in Manchester—took possession, and paid a magnificent rent for it, in order to disfigure both the house and the whole neighbourhood. He (Mr. Farrell) said that the Corporation should control this. The Corporation of Edinburgh controlled such things in that city. It was stupid nonsense, in his opinion, for the members of the Corporation to contend that they had no power to deal with these things. If they had not it was more to their disgrace, for they could have that power if they applied for it. In the cities of the Continent, and in some of the towns of this country, such disfigurements as he had referred to were unknown, simply because the men who were returned to the municipal body took the precaution to provide themselves with the power to prevent the development of unloveliness and the throwing away of speculators' money needlessly. He thought it was unfair to architects, as well as to capitalists, that the Corporation should permit these things, and he suggested that some power should be brought to bear upon the Corporation to put an end to the system of mural advertising. If that were done he had every confidence in Mr. Darbyshire and the rest of the architects of Manchester being able to make the city as fine and as beautiful, architecturally, as any in the country.

Mr. A. H. Davies Colley, president of the Manchester Architectural Association, said he supposed some fault must rest with architects, but it seemed quite possible to him for the

municipal authority to exercise some kind of influence with regard to the architecture. He agreed with Mr. Farrell that the state of things in Edinburgh was much more satisfactory than it was here, and he thought it was so both in Birmingham and Newcastle. Probably some sort of a board of architects, and, if they liked, of artists too, might be appointed who should have a say as to the general lines of a building, its general suitability to the streets, and to the buildings right and left of it. If some sort of supervision was exercised by a competent board of that kind, he thought a better state of things would be the result. He thought, too, it was quite possible to devise methods of making the slums far more lovely and less ugly than they were now, and also that the city might be made more attractive, at least in the summer, by displays of plants and flowers in tubs, in open places like Piccadilly, Albert Square, and St. Anne's Churchyard.

Mr. John Brooke said he for one did not agree with Lord Egerton's sweeping remark about the unloveliness of Manchester. He thought Manchester was far from unlovely. Any one passing through the city on Sundays or Saturday afternoons, when there was no smoke, must be impressed with the beauty of the outlines on looking down almost any street of the city. He thought there were very few towns in the kingdom where there were more beautiful outlines in the streets. This pointed to one centre that must be attacked, and attacked vigorously, namely, the smoke nuisance. The architects of Manchester had to complain of the want of attention that was displayed to any suggestions made by architects to the Corporation. Such suggestions had been received, if not with discourtesy, with more or less of contempt.

Mr. Robert Falkner (a member of the Art Gallery Committee of the Corporation) said he did not agree with Mr. Farrell that Mr. Darbyshire's remarks had no practical ending. The whole tendency of them was that there was no committee in the Corporation who had any jurisdiction upon the æsthetic appearance of the city. It seemed to him (Mr. Falkner) that as the City Council had outside gentlemen on the Art Gallery Committee, similar aid might be given by competent gentlemen upon this particular subject. The great difficulty which architects had to contend against was the excessive deposit of carbon, and in a few years their buildings were covered with black slime. If that could be got rid of the appearance of the city would be greatly improved. A complaint had been made about the hoardings and placards. The Corporation had upon their hands a large quantity of vacant land surrounded by

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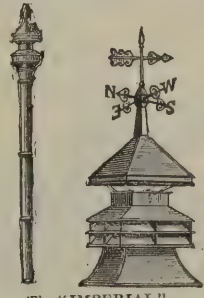
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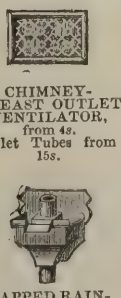
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hoardings, and in the interests of the citizens the hoardings had been turned to account and let to the advertiser until the land was required for building purposes. When that time came the placards would disappear. With regard to the suggestion as to the planting of plants and flowers, he was afraid, as Dr. Tatham, medical officer for Salford, put it in his report, that each year got more hopeless, and he really doubted whether such things would flourish in Manchester until we got something like purity of atmosphere. He hoped, however, that the experiment would be tried. Speaking as a member of the Art Gallery Committee, they—the outsiders on the committee—in their last report intimated to the Corporation that they should be glad to form a body or be consulted upon any points when the æsthetic conditions of the city were under consideration. He was sorry to say that that suggestion seemed to have fallen upon unfruitful ground, for nothing had been brought before them in any shape or form. A point on which he felt strongly, and on which he thought the Corporation was much to blame, was that in laying out new streets like Deansgate they did not leave a square or a circus down the entire length. It was almost a disgrace to the city that the Corporation should have laid out a fine street like Deansgate, from the Cathedral to Knott Mill, without leaving one such open space. That would not have been done in Edinburgh or London. In Deansgate there was ample room for a square or circus here and there, and besides adding to the beauty of the street, the Corporation would have had extended frontages to dispose of. The same remark applied to Market Street, from Piccadilly to St. Mary's Gate; but there they were dealing with what had been done by a former governing body of the city. He hoped the time would come when such things would not be tolerated, and when the Corporation should be compelled to give architects the opportunity of their work being seen.

The Chairman said he was disappointed that members of the architectural profession present had not said a little more about the defects or deficiencies of the building by-laws of the city. The first notion of holding this meeting was due to a remark made on that point by Mr. Darbyshire in the course of a lecture he had delivered in Ancoats. His remark showed that, under the present by-laws, the Corporation not only did not encourage but actually discouraged anything of an architectural character for the beautifying of a neighbourhood. The Corporation had got powers for two things, namely, the superintendence and control of buildings for sanitary reasons, and secondly, for the safety of the public. If they did not possess

powers which could enable them to encourage the artistic side of architecture, the sooner they obtained them the better.

Mr. John Angell said there was no doubt that black smoke could be prevented from entering the atmosphere, and that it could be done cheaply and effectively was shown by the successful system of smoke-prevention which is in operation at Farnworth Bridge, near Bolton, the invention of Mr. Herbert Fletcher.

Councillor Richard Newton, on the invitation of the chairman, addressed the meeting. He said he was not a member of the Improvement Committee, and those who were not on a committee knew very little of what happened in it. He was, however, on the Parks and Cemeteries and Nuisance Committees, which dealt with matters which had been touched upon in this discussion. One was as to the prevention of smoke. About three-fourths of the members of the Nuisance Committee, himself among the number, had had the pleasure of seeing Mr. Fletcher's system in operation at Farnworth Bridge, and it was certain as the result of that visit that something would be done within the next few months to prevent the smoke nuisance in Manchester. An excellent suggestion had been made that evening with reference to the placing of some kinds of plants or shrubs in tubs which should be put down in Albert Square, in front of the Infirmary, and other prominent places in the centre of Manchester. The Parks Committee was on the point of dissolution; but if he was again elected a member of it for the coming year, and it was very likely that he would be, he would take care that the subject was discussed there. The suggestion might be carried into effect without entailing much expenditure. With regard to improvements in the style of our public buildings, well, trade was bad, and a terrible ghost always haunted every man in the City Council who began even to think about the subject. One gentleman had remarked that the Victoria Buildings were a magnificent pile. Members of the Council wished them elsewhere, as they were an unfortunate possession. A good deal had been said about the duty of the Corporation. He had considered the matter, and stood by the opinion that Manchester was as well governed as it deserved to be. If gentlemen would go into any district of Manchester and hold a meeting upon a subject of general interest and importance there were sure to be a very small audience; but get a candidate who could deliver witty speeches, or indulge in personalities about his opponent or if a scandal or row was anticipated, the room would be filled. It was an easy matter to find fault with members of the City

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County Council, but it was not reasonable or sensible to do so. Great difficulty was experienced in securing candidates for the seats in the City Council; the post of Councillor went begging all over Manchester, and for every man who gave his consent to be nominated ten had refused. Why was this? It was because gentlemen looked down on the position of Councillor, and as long as such a feeling existed amongst the educated and leisurely portion of the community there would be an ugly city to look at, and rich men would see money wasted on objects that they cared nothing about, and they deserved it. Until the educated, the leisurely, and well-to-do set themselves to perform the serious duty of citizens, and there was less difficulty to induce them to enter the Council, the evils complained of would exist and never be cured. It must also be recollected that members of the Council could never move faster than those behind them in the city. The defect was, therefore, not in the Town Hall, but in the constituencies, and if the people would only stand by and support their representatives, all that was wanted would and could be done.

Mr. Darbyshire, in replying on the discussion, said that it had not been in vain if it had only established that the smoke nuisance could be cured. Following that discovery they could have their trees and their colour, and a thousand and one things that they could not have while the smoke nuisance existed.

### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

15806. Richard Newell, for "An improved method and means for ventilating rooms and buildings." November 2, 1888.

15850. John Allen Smith, for "Improvements in window-fasteners." November 2, 1888.

15879. John Clayton and Charles Tindall, for "Improvements in and relating to water-closets." November 3, 1888.

15899. William H. Kent, for "An improved device for

moving curtains attached to rings hanging upon poles or rods." November 3, 1888.

15920. John Henry Lightbody, for "Improvements in the manufacture of water-cisterns and other analogous articles." November 3, 1888.

16011. James Shepherd, for "Improvements in treads for stairs, steps, landings and floors." November 6, 1888.

16019. Henry Tudor Owens, for "Improvements in mechanism for operating fanlights, skylights, ventilators and other similar movable parts of structure." November 6, 1888.

16053. Charles Huelser, for "A new fireproofing device for walls, ceilings and other objects." (A. Fenton, Germany.) November 6, 1888.

16064. James Cosgreave and Louis Morley, for "An improved vent and shut-off apparatus, for shutting off water from supply-pipes, and for preventing sediment and other impurities flowing from a cistern into the service-pipe." (Complete specification.) November 6, 1888.

16126. Mary Woodward, trading as James Woodward, George Price and Ned Collier, for "Improvements in and in the apparatus for the manufacture of sanitary pipes, and other like socketed or flanged earthenware articles." November 7, 1888.

16129. Joseph Emile Lansard, for "An improvement in the contact makers of electrical alarms for doors and windows." November 7, 1888.

16142. Augustin Hentschell, for "Improvements in apparatus for washing roadways and clearing the snow therefrom." November 7, 1888.

16155. Joseph Thornton, for "Improvements in and relating to domestic and other fireplaces." November 8, 1888.

16169. Francis Fryer Abbey and Allen Walshaw, for "An improved chimney or chimney-pot for the prevention of down draughts." November 8, 1888.

16177. Edwyn John Barker, for "An improved pattern valve or draw-off tap." November 8, 1888.

16182. James Chandler, for "An improved sash-fastener." November 8, 1888.

16185. Arthur James Smith, for "An improved apparatus for dressing white lead and other colours." November 8, 1888.

16197. Moses Bowring, for "Improvements in moulding bricks of fire-clay, and bricks (or briquettes) commonly known as 'Bath bricks.'" November 8, 1888.

16214. John Phelps, for "Improvements in the eaves gutters of roofs." November 8, 1888.

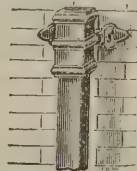


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## PROVISIONAL SPECIFICATIONS ACCEPTED.

12842. Paul Leigh le Duc, for "Improvements in the construction of and in connections between axles or shafts and wheels, or other apparatus rotating around said axles or shafts, applicable to conveyances, machinery, revolving ventilators, or other apparatus." September 5, 1888.

13040. Hugh McKibbin, for "A novel arrangement of window-frames or sashes and the fasteners therefor." September 10, 1888.

13654. Comyn Ching, for "An improved chimney-breast ventilator." September 21, 1888.

13720. Samuel Alfred Varley, for "Improvements in the construction of lightning-conductors for the protection of buildings." September 22, 1888.

14327. Alexander Hutchison, for "Improvements in the construction of baths." October 5, 1888.

14491. William Sayer, for "Improvements in apparatus for making bricks, tiles, and similar articles from plastic clay and the like." October 9, 1888.

14539. Thomas Stephenson, for "Certain improvements in earthenware tiles." October 10, 1888.

14595. William Jarvis, for "Chimney tops." October 11, 1888.

14734. Bridgman Russell, for "An improved air-inlet ventilator." October 13, 1888.

14786. James Broadhurst, for "An improved oven or kiln for firing pottery or other articles." October 15, 1888.

14806. Archibald Duff, of the firm of Archibald Duff & Son, for "Improvements in and relating to drain-pipes." October 15, 1888.

15007. Joseph Arnold, for "Improved apparatus for disinfecting sewer gases." October 18, 1888.

15236. John Dewrance and Bonneval Edward Church, for "Improvements in the process of cementing asbestos." October 23, 1888.

## COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

15692. William Cooper and John Holdsworth, for "Combined hose, cart, fire-escape, and portable scaffolding." November 16, 1888.

16963. Arthur Klidge, for "Improvements in apparatus for opening and closing fanlights, skylights, and casements, and for retaining them in any desired position." December 9, 1887.

17542. Henry Sutcliffe, of the firm of Wright Sutcliffe & Son, for "Improvements in machines for the manufacture of water-closet basins, syphon and other bent pipes or stench traps in earthenware." December 21, 1887.

252. William Robert Green, for "Improvements in hydraulic lifts." January 6, 1888.

444. Joseph Hall, for "Improvements in firebrick register grate backs." January 11, 1888.

3856. Thomas William James and Henry James Brookes, for "Improvements in window sashes." March 13, 1888.

14029. Harold Berry, for "Dry earth and other closets." September 29, 1888.

14354. Harry Smith Edwards, James Harry Edwards, and George Straker Falck Edwards, for "Improved process of manufacturing cowls and apparatus therefor." October 5, 1888.

## PATENTS SEALED, NOVEMBER 9, 1888.

14460. Philip John Davies, for "Improvements in sink cones and stink traps, and casting them with lead." October 24, 1887.

14639. Henry John Alexander, for "Improved arrangement of ventilator for shafts, pipes, roofs, and the like." October 27, 1887.

14734. Samuel Carnaby, for "Improvements in apparatus or appliances for turning, opening, or closing Venetian window-blinds, ventilators, well-balanced windows, and other objects of a like nature." October 29, 1887.

683. William Charles Adolphus Holzapfel, for "An anti-corrosive composition for the protection of the inside of iron and steel vessels, bridges, piers, and other structures which may be exposed to the action of the atmosphere or water." January 16, 1888.

10035. Richard Wade Boyd, for "An improved ventilating and air-heating stove." July 10, 1888.

10527. Alfred Julius Boulton, for "Improvements in machines for lifting or delivering bricks or other articles." July 20, 1888.

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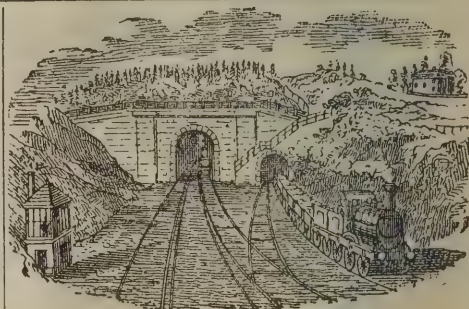
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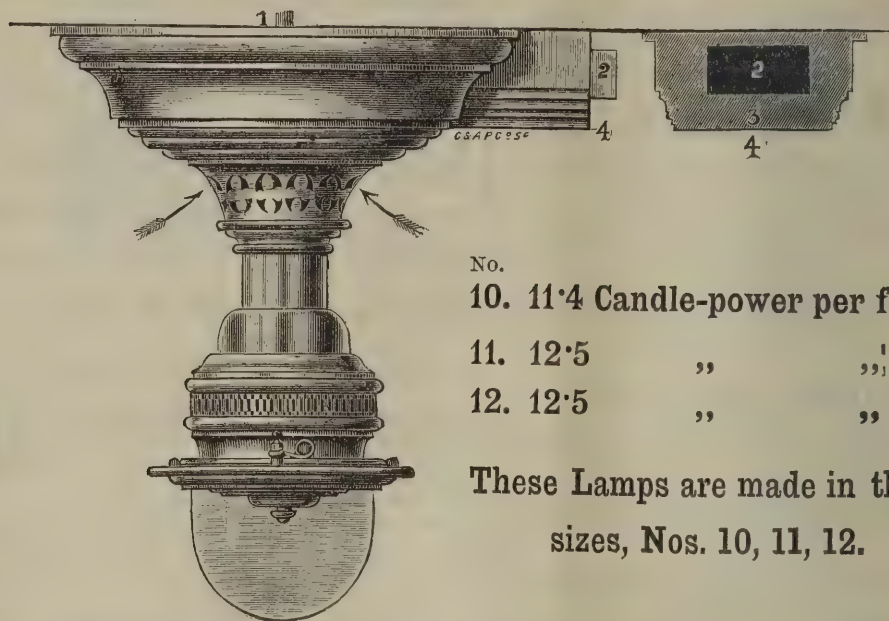
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No.			
10.	11·4	Candle-power per foot.	
11.	12·5	"	"
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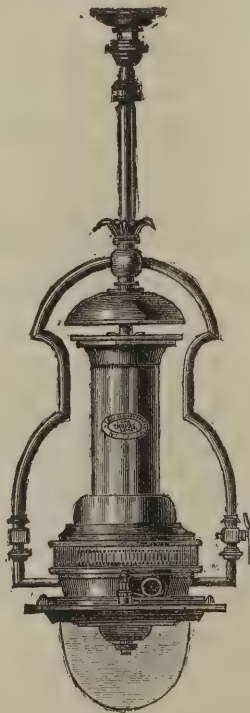
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Patent, as in other lamps which  
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# The Architect.

## THE WEEK.

THERE is fear that in the war between Government departments the competition for the new Opéra Comique of Paris will not be allowed. An official has prepared a design, and, as usual, a Minister is to be found to declare that it cannot be surpassed. The architects who hold Government diplomas have sent a memorial to the Minister of Public Instruction, who is the champion of the official's design. They say that, as the rebuilding of the theatre is a national work to be carried out by the Government, it is desirable that French artists be called on to co-operate in that work. It is argued that a competition is necessary, in order to display the new ideas upon the subject of the construction of theatres which are in the minds of architects, and which may lead to a transformation of the plan of those buildings. The memorialists, therefore, for the sake of art and in the interest of the public, solicit the Minister to use his influence in order that the project for competition shall not be set aside. Will M. LOCKROY be moved by the prayer of the memorialists? He may adopt the official plan because he fears that any other would probably lead to more expense than is desirable. M. LOCKROY cannot forget that the Opéra does not pay, and that its demolition was recently proposed. His ambition may be to create a more profitable building.

STRANGERS and children find subjects for admiration in the booths which from time to time appear in the streets of Continental cities and towns, but the inhabitants of the neighbourhood are not so well satisfied. In some places the boisterous music of the shows is not allowed in the day, but night can be made hideous by drums and trombones. People might bear with the revel on general holidays, but to be pestered by a crowd of idlers at busy times would overcome a philosopher. One of the artists' quarters of Paris now suffers from a renewal of a calamity known as the *fête foraine* of Montmartre. It spreads over the outer boulevard and into the adjoining streets, where there are painters' studios. There is not only noise, but a risk of an outbreak of fever, as the invaders care little for sanitation. The authorities appear too infirm to forbid the *fête*. A vigilance committee has therefore been formed, for the purpose of discovering some means to save the quarter next year. Among the members are M. GÉRÔME, the painter; M. ALEXIS BOUVIER, the novelist; M. BUSNACH, the dramatist; M. E. VIOLLET-LE-DUC, of the Historic Monuments Commission; and many other artists, writers, and savants.

ONE hundred and fifty designs for the diploma of the Paris International Exhibition are now before the jury who have to select the few which are to lead to the second competition. The Eiffel Tower is introduced in the majority of the designs as the most distinguishing feature of the Exhibition and the best suited to accompany the types of Labour, Peace, Truth, and the rest. Some artists have evidently set more value on the Exhibition as a memorial of the Revolution than as a field for the competition of all nations in works of peace. It is not impossible that a commission for the diploma will have to be given to some artist of eminence. BAUDRY's design served its purpose, yet it was not obtained by a competition.

SHERIFF COWAN delivered a righteous judgment in Paisley on Tuesday, when a church committee was made to pay money for plans. It appears that Mr. JAMES HAMILTON, a Glasgow architect, set out the site for a new church at Cardonald, and afterwards he prepared sketches for the building. The committee subsequently obtained plans in competition. Mr. HAMILTON applied for payment for his services as a surveyor, making no charge for the sketches, but the committee would not pay. Then an action was taken, when the committee pleaded non-employment. The Sheriff decided in favour of Mr. HAMILTON, and awarded him 36*l.* 1*s.* 4*d.*, with costs, for his work in preparing the

ground plans and pegging off the site for the church up to the time it had been agreed to have competitive plans. The Sheriff said that Mr. HAMILTON was an architect of some standing, and the presumption was all in his favour that it was not to be expected that a professional man was to give his labour and time for nothing.

MR. H. D. APPLETON read a paper on the "Affiliation of Architectural Students' Societies" before the Birmingham Architectural Association on Tuesday. The desirability of a strong bond of union between the students of architecture throughout the country was advocated, and it was urged that the union could be best accomplished by the aid of the students' societies of the United Kingdom. It was considered probable that such an amalgamation would result in interchanges of opinions and experience as would be calculated to make the students more proficient in their profession. With the Architectural Association as the bond of union there is a chance that the affiliation would be advantageous to many students.

THE South Kensington Handbooks are not to be devoted to art. Already two have appeared on "Adulteration of Foods" and on "Water." Another is now obtainable, which treats of "Marine Engines and Boilers," and is intended to supply, in conjunction with the collection of models relating to marine engineering at South Kensington Museum, a continuous account of the progress and development of the marine engine and boiler from the date of its first practical introduction, just a century ago, down to the present time. The handbook is written by Mr. G. G. V. HOLMES, the secretary of the Institution of Naval Architects, and is amply illustrated. It will be useful to students of mechanical engineering.

THE organ which blocks the north transept of the church of Stratford-on-Avon is to be removed, one portion to a position over the tower arch and facing the nave, where it will be supported by an ornamental gallery, and the remainder to be placed behind a carved screen below, near where the pulpit now stands. The cost of the work will be about 2,000*l.* The removal is to be commenced without delay, in order that the organ may be available for Easter.

THE Parliamentary notices are given of an application for an Act which will authorise the taking of the property in the parish of St. Margaret and the close of the collegiate church of St. Peter, Westminster, "for the purpose of opening out a view of Westminster Abbey, the chapter-house, and other buildings, and to appropriate a portion of the site so cleared for the erection of a monumental chapel in connection with Westminster Abbey," and in improving the approaches to the abbey and other property. The lands and houses proposed to be taken are "all the lands, houses, buildings, streets, roads, and premises within the area bounded on the east by Old Palace Yard and Abingdon Street, on the south by College Gardens, on the west by Dean Street, and on the north by Poet's Corner and Westminster Abbey." Parliament will also be asked to sanction the application of the whole or some part of the moneys raised or to be raised under the "Act to further continue and appropriate the London Coal and Wine Duties," or under any other Act or Acts; and to enable the London County Council, the Westminster District Board of Works, the Dean and Chapter of Westminster, the Government, the Ecclesiastical Commissioners, and any other body, trustees, &c., under disability to apply their funds to the objects of the intended Act; "and, if need be, the Act will authorise the levying of rates and assessments and the borrowing of money on mortgage, or by such other means as shall be sanctioned by Parliament." The proposed Act will or may provide that the chapel and any lands acquired under the powers to be sought for shall vest in the Dean and Chapter, the First Commissioner of Works, or in such other person or persons as the Act shall direct. Its powers and provisions will be carried into effect by commissioners or trustees, or by such other body or persons as Parliament shall determine.



## JOHN SELL COTMAN.

IT sometimes happens that a foreign critic is better able to anticipate the judgment of posterity upon English works. Being free from local or temporary prejudices, he is likely to be more impartial than the artists' countrymen, who may be biassed by enthusiasm or are indifferent through fear of self-reproach. When, therefore, we find M. CHESNEAU telling Frenchmen that JOHN SELL COTMAN, for his his tender and imaginative interpretation of Nature, should be set above many painters who had gained more renown—"JOHN SELL COTMAN que sa tendre et imaginative interprétation de la nature place au-dessus de beaucoup de peintres pour qui la renommée a été plus partielle"—we may believe that the painter's fame is not likely to decline hereafter. COTMAN would not be the first artist who was neglected during his life and idolised when dead. The exhibition of a collection of his drawings in the rooms of the Burlington Fine Arts Club is a token of the reputation which his works have gained in the course of a few years.

Little is known by most people about COTMAN, and hence it is often supposed that he worked at Norwich in the last century. But he died as late as 1842, in London, when he was in his sixtieth year. We may allow the eighteenth century all the credit that arises from his birth and early training, but as an artist he belongs to the present century. Happily there is as much grace and quietness about his works as if he were free from all influence of the feverishness and competition which characterised the greater part of the time since COTMAN lived in England.

What must strike every one who sees COTMAN's drawings in the Burlington Fine Arts Club or elsewhere is the general absence of features and effects which might be considered as baits to allure patrons. He painted as if for his own enjoyment, and did not hesitate about doing a great many things of which people would disapprove (such as painting the sea with brownish waves), as they were departures from what was commonly seen in galleries. Yet he was always poor, and although the sale of a drawing at any time would be of more importance to him than to the majority of his contemporaries, he never sacrificed his ideal. COTMAN, on the contrary, was ready to sacrifice most things for the sake of art. He was the son of a shopkeeper in Norwich, and if he had kept to silks and laces he might have prospered. There was, however, a spirit of rebellion everywhere in those days, and young COTMAN fled from Norwich to seek fame and fortune as an artist in London. Like so many with the same sort of ambition, he attracted the attention of the benevolent Dr. MONRO, who used to invite young artists to his country house in Bushey and pay them for sketching. COTMAN soon made his mark. In 1800 six of his drawings were to be seen in the Royal Academy, and in the same year he gained the palette of the Society of Arts. The titles of his drawings suggest that he sketched in Wales, Shropshire, Yorkshire, Lincolnshire, as well as nearer London. In a letter to DAWSON TURNER, the antiquary, dated November 30, 1805, COTMAN says:—"My chief study has been colouring from Nature, many of which [drawings] are close copies of that fickle Dame, consequently valuable on that account"—a statement which reveals his desire to be truthful. A letter to the same correspondent in the following year shows him settled in his native city. "In consequence of advice from several of my friends in Norwich," he writes, "I have taken a house in Wymer Street for the purpose of opening a school for drawing and design. It will give me the opportunity of turning myself about during my stay, and studying painting, which of late I have done but little, having been engaged in other things." At that time there was a Society of Artists in Norwich, and to the Exhibition of 1807 COTMAN sent twenty works. They were not all landscapes, as among them were six portraits and a sketch after VANDYKE, which suggests an attempt in a new field. In 1808 he was elected a member, and in the Exhibition of that year he was represented by sixty-seven works! There were figure subjects, portraits, and two "historical designs," besides the landscapes. It is also evident that COTMAN was trying his hand in oil-paintings, and we may note that he described himself as a "portrait-painter."

He was married in 1809, being then twenty-seven, and, to meet his increased expenses, he devised a plan of utilis-

ing his unsold drawings, which will be suggested by a copy of his advertisement:—

## A CIRCULATING COLLECTION OF DRAWINGS.

J. S. COTMAN

Has opened to the Public, on the plan of a Circulating Library, a COLLECTION OF SIX HUNDRED DRAWINGS, consisting of Landscapes, Compositions on Design and Figures, Coloured Sketches from Nature, Sketches in Claro Oscuro, and his original Pencil Sketches from the Saxon, Norman, and Gothic Architecture, chiefly from the counties of Yorkshire, Lincolnshire, Essex, and Norfolk.

Quarterly Subscription Ticket, One Guinea. J. S. Cotman will attend the delivery of the drawings to the subscribers, that he may facilitate their copying of them by his instructions.

Days of delivery, Mondays and Thursdays, between the hours of twelve and two.

In the Exhibitions at Norwich he used to mark certain drawings with an asterisk in the catalogue in order to denote that they belonged to his "circulating portfolios." COTMAN afterwards endeavoured to popularise his drawings by bringing out a series of etchings from them. For the first volume he obtained 212 subscribers, partly through the influence of his friend DAWSON TURNER, who lived in Yarmouth. In 1812 he removed to Southtown, where he taught drawing, but at the same time he kept up his connection with Norwich. The local artists recognised his merits by electing him president of the local society which had been founded by Old CROME and his pupils in 1805. Besides his work as a painter and a teacher, COTMAN brought out several books or collections of plates, such as "The Architectural Antiquities of Norfolk," "Norman and Gothic Architecture," "Antiquities of St. Mary's Chapel at Stourbridge," "Sepulchral Brasses in Norfolk," and especially "The Architectural Antiquities of Normandy," which was prepared in conjunction with DAWSON TURNER. He continued to exhibit in Norwich, and, as he was elected an Associate of the Society of Painters in Water-Colours in 1825, his work was also seen in London.

With all his efforts, the patronage he obtained was insufficient to enable him to live in comfort. COTMAN was naturally a sensitive man, and his disappointments gave him much pain. It is evident that in 1826 he was in terror about the fate of himself and his family, for his income was no more than 200*l.* a year. DAWSON TURNER, being apprehensive that the artist would go mad if he brooded over his misfortune, endeavoured to cheer him, and wrote a letter which is a model of friendliness and good sense. He advised COTMAN to give up his style of work, as it evidently was not satisfactory to the public. "The public," he said, "is a body that cannot be forced; some extraordinary geniuses may have succeeded in guiding it, but they are few, and the great part of those who have made the experiment have failed. Such as have to live by it must be content to follow its taste." The advice is a testimony to the originality of COTMAN's style, which the public of that time could not appreciate. The artist endeavoured to shake off his grief and set to work with new vigour, but purchasers continued to keep aloof from him. Three years afterwards, that is, in 1829, we find him writing to a clergyman:—"My views in life are so completely blasted, that I sink under the repeated and constant exertion of body and mind. Every effort has been tried, even without the hope of success; hence that loss of spirits amounting almost to despair. My eldest son, who is following the same miserable profession with myself, feels the same hopelessness; and his powers, once so promising, are evidently paralysed, and his health and spirits are gone. My amiable and deserving wife bears her part with fortitude. But the worm is there. My children cannot but feel the contagion. As a husband and father, bound by every tie human and divine to cherish and protect them, I leave you to suppose how impossible it must be for me to feel one joy divided from them. I watch them, and they me narrowly; and I see enough to make me broken-hearted." Yet at the time when COTMAN was suffering so much, he was obliged to take part as a steward in conversaziones which were got up in Norwich! Then, as now, it was necessary that amusement should be found for amateurs, whose interest in art rarely takes any other form.

Norwich was afforded the spectacle of a brave man undergoing misfortunes until 1834, when, partly through the help of MALLARD TURNER, the Professorship of Drawing in King's College, London, was offered to COTMAN. He



gladly accepted the appointment, but it was necessary to obtain money, and accordingly his furniture, books, pictures, drawings, armour, and in fact all the things which an artist finds a pleasure in having round him were sold. The highest price obtained for one of his oil-pictures was 5*l.* 5*s.*

COTMAN's residence in London was No. 42 Hunter Street, Brunswick Square, and the house should be marked by one of the tablets of the Society of Arts. He had passed his fiftieth year, and, from his position, might hope to lead a life that was more free from care. From his experience as a drawing-master he was well able to teach in the King's College classes, and the authorities of the College were considerate towards him. When he found the work onerous they appointed his son as assistant. His time was not entirely occupied with his duties in the College, and he was able to paint and etch. COTMAN was happy for a time. It is satisfactory to know that the Institute of Architects recognised his enthusiasm for ancient work by electing him as an honorary member. His "*Liber Studiorum*," a collection of forty-eight etchings, appeared in 1838. Soon afterwards his health began to decline, but he continued to work until the beginning of 1842. His death was ascribed to "natural decay," but it must have been owing partly to a recurrence of the old depression, which made him indifferent about all things. The doctor said that COTMAN was not suffering from any disorder, and that his depression was the consequence of not taking sufficient nourishment to gain strength. His daughter said that he "always expressed himself as though he hoped it would be the last time he should have to take anything." He was buried in the St. John's Wood Cemetery.

COTMAN's reputation will rest on his landscapes, taking that word as comprising drawings of the sea and buildings. Whatever the subject, it is treated with refinement. He was a close and loving observer of nature, and his sketches never fail to give the character of a scene. What, for instance, can be simpler than the drawing of Twickenham, of which the elements are a few trees obscuring the greater part of a house, with a couple of boats and a few figures? But somehow the drawing is more suggestive of Thames scenery, as seen along that part of the river, than larger works with much detail. He was one of the men who were able to appreciate the beauty of trees, and he is never happier than in subjects in which he could also introduce a lake or river to reflect the depths of their shadows. COTMAN was brought up in a flat country, but his early visits to Wales and Westmoreland impressed him with the grandeur of mountain scenery, and he always drew it with vigour. He was not much of a sailor, and probably would hardly venture to imitate TURNER, and be lashed to a mast in order that he might study waves. But as far as it was possible to be acquainted with the sea by watching it from the coast, COTMAN succeeded. The plate we publish this week reveals something of the power of waves. It may serve also to suggest COTMAN's power in representing clouds when winds are blowing. He is no less vigorous in depicting clouds that are not storm-tossed, and it may be said that, if judged by his atmospheric effects alone, COTMAN would be considered as having the powers of an interpreter of nature. COTMAN was one of the greatest of English architectural draughtsmen, and, as became an artist who in his early days was familiar with the Mediæval buildings of Norwich, he cared only for Gothic forms, and he was equally successful in representing what was found in France and Belgium. His architectural drawings, like his landscapes, are free from mannerisms; indeed, there are so few repetitions of that kind in his works, that some excuse may be offered for the authorities of public galleries when they introduced works as genuine which never came under COTMAN's eyes. Every subject seemed to suggest some new mode of treatment to him, and on that account it is most difficult to define COTMAN's characteristics as a painter.

There are three collectors who are fortunate in possessing many of COTMAN's water-colour drawings and drawings in black and white. They are Mr. BULWER, Q.C., Mr. COLMAN, M.P., and Mr. JAMES REEVE, and they have liberally contributed to the Exhibition in the Burlington Art Club. Mr. REEVE is not only a collector of drawings, but he has garnered every letter of COTMAN's or scrap relating to him, and his house in Norwich is a treasury of works of the Norwich School, and of information upon the artists.

## THE ARCHITECTURAL ASSOCIATION.

THE third ordinary meeting of the Association was held on Friday evening, Mr. H. D. Appleton, president, in the chair.

Mr. C. H. Brodie announced the formation of a social club, under the title of the Architectural Association Lyric Club, with Mr. H. D. Appleton as president, and Mr. Julian and Mr. Miller as vice-presidents. Two meetings will be held monthly, and the first of the series of smoking-concerts will take place at Anderton's Hotel, Fleet Street, on Thursday evening, December 6, at 8 P.M.

Mr. A. T. WALMISLEY, C.E., read a paper.

### Theory of Arched Structures.

Mr. Walmisley said that arches might be theoretically divided into classes:—(1) Treating of arches constructed of blocks of stone or brickwork, termed "*voussoir arches*"; and (2) treating of structures which are continuous partly or throughout, and which are termed for distinction "*elastic arches*," and that in a short paper it would be impossible to endeavour to exhaust the whole subject of arch construction. His remarks were therefore confined to those arches which are made up of cemented blocks, as the elastic arch belongs more to the province of civil engineering, whereas the *voussoir* arch plays an important part in nearly all structures designed by an architect. The laws which govern the stability of arches are the same for arches of any shape or form, whether applied to a bridge, vault, dome, or to any other arched structure. With this assumption it will be immaterial what form of arch the author illustrates to enable him to elucidate the theory, as any other form of arch can be treated in a similar manner. As a basis, it is usual to assume that each bed-joint in an arch-ring acts as a hinge about which the *voussoirs* are free to turn, and no allowance is therefore made for the adhesion of the mortar in the joints, so that to obtain stability the arch should be in equilibrium throughout.

There are many reasons why the adhesion of the mortar should not be considered: first, that in some cases mortar between the *voussoirs* has been left out altogether, and sheet lead substituted; secondly, that the mortar or cement, although generally good, may, through carelessness, be inferior in some of the bed-joints; thirdly, that an accumulation of dust, and neglect to saturate the surface of the material with water, may effectually prevent proper adhesion; and fourthly, vibration of the centres may be produced by the deposit of material, or movement may be caused by the varied positions of the loads as the work advances up the haunches.

In arches there are three different causes of failure:—(1) The arch may not be in equilibrium, and may collapse by altering its form. (2) The stones may be crushed. (3) The *voussoirs* may slide on their bed-joints.

The curve of equilibrium being an imaginary line representing the centre of pressure throughout the arch (supposing that the material were strong enough to resist crushing), the whole of the arch-ring might be removed except that portion immediately around the curve, and the arch would still remain perfectly stable. The curve of equilibrium changes its form for every alteration of load, except when all the weights are altered in the same ratio, in which case the load can be augmented or diminished, and the same curve maintained.

One of the conditions usually adopted with regard to the curve of equilibrium is that it should everywhere be within the middle third of the arch-ring—that is to say, if we divide the depth of the arch into three equal parts, forming concentric rings, the curve should everywhere be contained in the middle ring. This appears at first sight to be rather an arbitrary condition, but can be easily explained.

It is a well-known fact that all bodies are elastic, so that they will be extended or compressed according to the nature of the stress put upon them, and as we cannot have a tensile stress in masonry or brickwork without taking the mortar or cement into account, we must so distribute our pressures that no tensile stress will be set up. It therefore becomes a question how far the line of pressure may deviate from the neutral axis of the arch without a tensile stress being produced.

No doubt it has frequently been observed that if a plank of wood floating on water is loaded at one end, the loaded end will sink below the surface, while the unloaded end will rise above the surface until equilibrium is obtained, or, in other words, until the centre of buoyancy of the plank is coincident with what we may term the centre of effort of the water. The rise and fall of the ends of the plank relative to the water surface depend upon the position or amount of the weight placed upon it, and it will be found that the bottom of the plank at the higher end will just be level with the surface when the centre of gravity of the united weight of the plank and imposed load is one-sixth of the length of the plank from its centre.

This same law can be applied to masonry, for, the stones



being elastic, the compression of its particles will be in proportion to the weight supported; and when the centre of pressure is removed one-sixth of the length of the bed-joint from the centre, the edge of the stone furthest from the load will be relieved from pressure and become just on the verge of tension, which is a parallel case with the bottom surface of the plank at the furthest end being just level with the water.

When the curve of equilibrium or curve of pressure is anywhere within one-sixth of the length of the bed-joint from the neutral axis of the arch upon either side, it will be in the middle third, and no tension will be produced. As the curve of equilibrium approaches the edges of the arch-ring, tension will be produced, which will gradually increase until the curve passes outside the arch-ring, causing it to collapse, but practically the arch would collapse much sooner from the crushing of the material. Where the curve rises above the extrados of the voussoirs the arch would sink, and where the curve passes below the soffit the arch would rise.

An infinite number of curves of equilibrium can be drawn for the same loading, depending upon the rise given to the curve. The selection of the true curve generally requires some preliminary consideration, and may be determined on the basis of Moseley's principle of least resistance. The late Professor Rankine, in his "Applied Mechanics" (p. 215, article 196), thus states this principle:—"If the forces which balance each other in or upon a given body or structure be distinguished into two systems, called respectively 'active' and 'passive,' which stand to each other in the relation of cause and effect, then will the passive forces be the least which are capable of balancing the active forces consistently with the physical condition of the body or structure."

Now it is clear from this statement that the best curve to select is that which produces the least horizontal thrust. If a rope is stretched between two points so that the deflection is one-fourth of the span, and a similar rope is stretched in the same manner so that its deflection is half the span, it will be evident that the rope which has the least deflection, or which is stretched the tightest, will have the greatest horizontal stress, and it will be found that the horizontal stress varies in an inverse proportion to the deflection of the rope, so that the rope with half the deflection will have twice the horizontal stress of the other. Any rope, whatever the span, must theoretically have some deflection, even when unloaded, such deflection being due to its own weight. These conditions will be exactly the same for an arch, and will determine the position of the curve according to Moseley's principle—that is to say, the curve to be selected is that with the greatest rise and least span. As the middle third has already been fixed for the limit of the curve, it is obvious that the greatest rise given to the curve must be the outside limit of the middle third, and the least span the inside limit of the middle third.

In selecting the curve, it may be found that a curve which touches the middle third at the crown and springing will be outside the limit at some other point, and we may be able to bring it everywhere within the limit by slightly moving the crown and springing further inside the limit. In that case the curve, which falls everywhere within the limit, and which approaches nearest to the limit both at the crown and the springing, will be the curve to be selected.

To approximately determine the depth of the arch-ring at the crown, we can apply empirical formulæ founded by Rankine on the dimensions of good existing work.\*

They are as follows:—

Depth of keystone for a single arch in feet

$$= \sqrt{(12 \times \text{radius at crown})}.$$

Depth of keystone for an arch of a series in feet

$$= \sqrt{(17 \times \text{radius at crown})}.$$

The depth of an arch-ring does not depend upon the crushing strength of the material so much as upon the curve of equilibrium, which usually requires wide limits to provide for the necessary stability, and thus gives an area many times greater than is required to resist direct crushing—in practice the proportion has varied between 3 and 70, but the above formulæ by Rankine are based upon examples varying from 20 to 40.

Having approximately designed an arch, the curve of equilibrium can be drawn; but should the required conditions not be satisfied, the design will require modification, either by increasing the depth of the arch-ring, altering the rise, or altering the loads on the arch.

Mr. Walmisley then described how the curve of equilibrium was to be ascertained, as well as the solution of other problems in the construction of arches.

A vote of thanks was proposed by Mr. Lovegrove, seconded by Mr. Percy Hunter, and supported by Messrs. Collard, Beale, Fleming, Randolph, Lanchester, and passed by acclamation.

\* Rankine's *Civil Engineering* (Tenth Edition), Art. 290.

## THE AMERICAN ARCHITECTURAL MUSEUM.

THROUGH the generosity of an admirer of architecture New York will be endowed with a collection of casts of architecture. The subjoined report of the acquisitions in Europe by Mr. P. L. le Brun was read at the last convention of the American Institute of Architects. M. Chipiez, of Paris, the Comandatore Lanciani, of Rome, and Signor Giacomo Boni, of Venice, who aided the representative of the Willard Museum, were elected honorary fellows of the Institute:—

I have at last the honour to report to you that the installation of the Willard Architectural Collection in the main hall of the older portion of the Metropolitan Museum of Art is a matter of the immediate future, and only awaits the transfer of the objects lately exhibited there to their spacious new quarters in the enlarged museum.

The overcrowded condition of that institution for years past necessitated the postponement of the selecting and purchasing of the casts until provision was assured for their proper disposition and display. This enforced delay has, however, been of advantage to the fund placed at your disposal by the terms of the bequest, in the accumulation of four years' interest on the money devised. It has also permitted a more deliberate maturing of the work of selection.

The construction of the museum additions having apparently progressed last autumn sufficiently to warrant the purchasing of casts, your agent made his second trip to Europe, under your direction, for this purpose. Of the casts he then secured, the larger portion, or two hundred and fourteen cases, have arrived—leaving about eighty cases yet to come.

These boxes remain still unopened in the cellars of the museum, owing to the lack of space required for properly distributing and sorting their contents and putting together larger objects, which are mostly shipped in many parts, requiring a careful readjustment. And, as it is the intention of the museum authorities to reopen their collections to the public with the inauguration of their new extension, about the middle of December next, it will be impossible within that limited time to mount and prepare the Willard casts for exhibition. Much as this is to be regretted, it seems to have been unavoidable.

Since my last report the museum has added the west court—formerly devoted to the modern sculpture—to the uses of the Willard collection. This, and the placing of the principal entrance to the architectural court in the centre of the south side of the main room, have brought about a few unimportant shiftings of the arrangement outlined in that report, but its main features will remain the same, and the collection will be distributed likewise with a view to its extension northward, when the additions on that side are built—as will be inevitably required in the future.

Within the limits of this communication it will be unnecessary to allude specifically to any but some of the more prominent objects thus far purchased. In the scheme of the collection, typical models of entire buildings, made to a sufficiently large scale to permit of the accurate reproduction of detail, were assigned an important position. They are to form central crowning illustrations of the peculiar features of each important style, around which are to be grouped castings of detail, photographs, and works of reference.

A number of estimates were obtained from specialists, and contracts were made with a skilled sculptor of Paris for the production (as a commencement) of models of the Parthenon and of the cathedral of Paris, made to the uniform scale of one-twentieth full size.

They are well advanced, and, from photographs lately received of the portions already finished, promise to be very successful. In these models all the applied sculptures and carving are to be faithfully reproduced. Of Notre Dame Cathedral the exterior only will be shown, but of the Parthenon both the exterior and interior will be equally finished.

The architectural fidelity of these models may be estimated when it is stated that they are being made under the direct supervision of that distinguished French architect, Monsieur Charles Chipiez, who stands among the first of living authorities on architectural archaeology and history. This gentleman, with a generosity and fraternally artistic feeling that cannot be too highly appreciated, placed his services, on my application, at the disposition of the Willard Commission, and has supplied the sculptor with the drawings necessary to elucidate doubtful points in the construction of the Parthenon, as to which temple he has made extended special and original researches in connection with his work (in collaboration with Monsieur Perrot) in the forthcoming volume of their "Histoire de l'art dans l'Antiquité." His solution of the disputed points as to the manner of admitting the light to the interior, and of the external and internal polychromy of the building, will prove most interesting and valuable. And we may confidently share his expressed hope, that the Willard model of the Parthenon "will give of that superb edifice, which is so capital for instruction, an exact and complete idea, and that it will produce a certain impression on the public." To



heighten the realistic effect of the work, in addition to the reproduction of the Phidian statue of Athene Parthenos, the temple will contain a number of portable votive offerings and other artistic treasures, lists of which have been handed down to us.

The educational value of such an exhibit may be estimated when it is pictured surrounded by casts of the various architectural members of the building, the large pedestal of the model hung with restorations in tint and black and white, and photographic views, the reference library near at hand, with the standard works of Michaelis, Bötticher, and Penrose and others. And in a contiguous court (provided by the munificence of Mr. Marquand) a complete collection of casts of every known fragment of sculpture of this noblest edifice, friezes, metopes, and pediments. Could the study of its subtle æsthetic beauties be possibly better facilitated?

As to the magnificent model of the cathedral of Notre Dame, its execution will be facilitated greatly by the sculptor's access to the numerous drawings and studies of Viollet-le-Duc—made at the time of the restoration of this building—drawings which the kindness of the diocesan architect has placed at his disposition. All the sculptures, in the round and in relief, and the carving, will be rendered with as strict accuracy as the scale admits, and the photographs of the lowest section of the façade, with its rich, deeply recessed triple portals and the gallery of kings above, when compared with photographs taken directly from the building, show a remarkable fidelity to the original, not only in the general feeling, but in the minutest details of the sculpture.

As to the "bits"—among the larger pieces are a full-sized reproduction or cast of the Erechtheion Portico of the Caryatides; a model of the Choragic monument of Lysicrates, one-tenth full size; one complete bay of the Cloister of St. John Lateran, with the mosaics coloured as in the original; the pulpit front of Sant' Ambrogio, at Milan; the celebrated choir-screen of St. Michael's, at Hildesheim; the interesting carved wooden doorways of Aal and Flaa, Norway; the pulpit of Siena Cathedral; the Shrine of St. Sebaldu, Nuremberg; the doorway of the large hall in the Palazzo Vecchio, Florence; the tabernacle of Sta Maria in Trastevere; Monument of Count Bougival, at Breda; Jean Goujon's doorway from St. Maclou, Rouen; a model of the façade of the Knochenhauer Amsthaus (called the finest carved wooden building in Germany), made in finest style at one-tenth scale, and coloured as in the original.

Numerous smaller bits have been also secured to the number of about 950. But the work of selecting and purchasing may be said to be only fairly begun. The casts already bought represent but a portion—the bony framework, as it were—of what will eventually form the Willard collection, whose formation will be necessarily the work of time. The completing of the series of models alone will take several years.

The commencement which this report outlines should, however, prove a sturdy start in a most important undertaking, and should wake up architects and artisans and the architecture-loving public of New York to a realising sense of the duties which the inauguration of such a collection imposes—the duty, profit, and pleasure of study; the duty and privilege of patronising and enlarging its scope. For, to carry out fully the ambitious programme of its initiator and public-spirited testator, the means yet unexpended will, from present indications, be exhausted before the Willard Collection acquires such organic completeness and rounded fulness as will make of it truly an historical epitome of art.

#### SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

AT the last monthly meeting of the Sheffield Society of Architects and Surveyors, a paper was read by Mr. E. J. Tarver, F.S.A., F.R.I.B.A., on "A Proposed Improvement in Theatre Planning."

It was remarked that fatal disasters occurred chiefly in passages and long staircases, which, being enclosed, afforded no expansion for the struggling column of human beings hemmed in between their walls. Thus the pressure became concentrated upon the foremost, if any hitch should occur even in an orderly exit, as at the Sunderland Theatre. He found these passages needlessly introduced and these staircases needlessly long in all existing theatres; for instance, the occupants of the front row of the gallery have usually to make an ascent of about 10 feet up to a back passage, and a corresponding descent of 10 feet down an enclosed staircase, bringing them to the precise level from which they started, after which they have to continue their descent to the street level. He traced the system of back corridors to the old opera-houses, whose several tiers of private boxes could be approached in no other way. A dramatic theatre, with its many rows of seats in each tier or gallery, offered a perfectly distinct problem to be solved, and Mr. Tarver said his method was to abolish back corridors as

entrances above the street level, and to enter from near the front in lowest row, thus leaving a much shortened descent to be completed in the enclosed staircases. He took special pains to guard against danger in rushing down the gallery. In working out this plan he duly provided for those who might have to escape from the back or highest levels, ample exits as to external stairs and landings, which gave a special character to the street front of his design.

Mr. C. J. Innocent said the paper had been eminently useful for architects and those concerned with theatres. The common sense and simple arrangements throughout the plan showed it had been well thought out. The site was of an ordinary and everyday character.

Mr. W. C. Fenton, building inspector, observed that having gone through many theatres in London and elsewhere of late, he considered Mr. Tarver's idea successful and practical. It had interested him much, as being the best plan of a theatre he had seen, providing the largest accommodation on a given area.

Mr. Cartledge pointed out the inconvenience of having the entrance to the gallery near the dress-circle entrance. People going to the gallery were in the habit of crowding round the door, and thus obstructing the people who wished to go into the house. To his idea the manager's office in the new plan seemed rather far from the street level.

Mr. Bramley directed attention to several features of the proposed new system of theatre building. It seemed to him that the pit was considerably below the elevation of the ground, and he would like to know if the descent from the exits to the door was not as dangerous as coming down a staircase. The difficulty was that in a time of panic the appliances, however ingenious, did not work. The Sheffield Theatre was arranged on short square flights of staircases, which were always square at the turns. The gallery staircase was supposed to be able to hold all the gallery could contain.

Mr. Tarver, in replying, answered various questions raised during the discussion. He said he had had the opportunity, through the kindness of Mr. Phipps, of seeing the new Shaftesbury theatre, which had external balconies. These, though of no great size, were sufficient, Mr. Phipps thought, to give the people confidence. The panic soon subsided if the people could get out of the building. He (Mr. Tarver) was not quite satisfied, and thought it would be better if the people could get down into the street. He was extremely pleased to find that no practical objection had been taken to his scheme in an assembly of gentlemen practically and professionally familiar with the subject.

#### LEICESTER AND LEICESTERSHIRE SOCIETY OF ARCHITECTS.

A LARGE meeting of members of this Society and their friends was held last week at the Medway Street Board School, Leicester, when Mr. R. Phené Spiers, F.S.A., delivered a lecture on the "Structural Origin of Some Forms of Mohammedan Architecture," illustrated by drawings on the black-board, and by an admirable collection of drawings and photographs. A vote of thanks, proposed by Mr. Jackson, seconded by Mr. Paget, and endorsed by the chairman, Mr. Tait, was carried by acclamation.

#### BUILDING IN GLASGOW.

THE opening meeting for the session of the Architectural Section of the Glasgow Philosophical Society was held on Monday night. Mr. James Thomson, the president, occupied the chair, and delivered an address, his subject being "A Review of Work done during the past Year." At the outset he referred to the losses the profession had recently sustained through death. After alluding briefly to the subjects of the registration of plumbers, the subway and Central Railway schemes, cross-river traffic, and the importance of improved dwellings for the working classes, he said that the recent great fire in Buchanan Street had had the effect of drawing public attention to the dangers that attend the mode of constructing large warehouses, and had drawn from the Lord Dean of Guild various remarks regarding it. He did not altogether agree with these remarks and statements, because he knew that the buildings in Buchanan Street destroyed by the late fire were erected in conformity with plans submitted to the Dean of Guild Court. If the plans were not properly drawn out they should not have been passed, and the work should not have been sanctioned, either at the beginning or the end of it. The two most important buildings which were sacrificed by the fire were erected within fourteen years, and were subject at all times to examination by the inspectors appointed by the Dean of Guild Court, so that if there were defects, which he dared say there



might be, these should have been seen and objected to at the time of building before the erections were ultimately passed by the Court as finished property. They all knew how architects got the blame of all defective construction, but in this case the whole blame could not rest with them. Speaking of the Exhibition, he said that the buildings and the numerous features of peculiar beauty all around them formed one of the finest pictures one could see anywhere. He did not think there had been any other voice than that of the most unqualified praise for the genius of the man who had conjured up and superintended the erection of the buildings, and who had crowned his life's work with this completed design, which, if produced alone, without another building, would have shown genius enough for one architect's life. Now they had to mourn his loss. It seemed cruel that a man should be snatched away just in the midst of work and honour. All that would soon remain of the great Exhibition would be the memory of James Sellars.

On the motion of Mr. Gildard, a cordial vote of thanks to the President for his address was agreed to.

Mr. David Thomson moved that the President and Mr. Lindsay Miller, the secretary, be requested to prepare a minute expressive of deep regret at the loss sustained by the death of Mr. Sellars, appreciation of his services to the section, and sympathy with his widow and family in their bereavement.

Mr. T. L. Watson seconded the motion, which was adopted.

### TESSERÆ.

#### The Influence of Vitruvius.

EMILE BOUTMY.

DURING a long period people looked at Athens through Rome, and with an incredible assurance credited the Greeks with the remains of architecture which are still found in the Roman Forum. Following the example of the great artists of the Renaissance, they imagined that in Vitruvius they possessed the Bible of Hellenic art, and all the forms which imagination drew from the sacred text were held to be authentic. It was believed that the Order of the temple of Hercules at Cora, or the Orders of Palladio, were as completely typical as the columns raised by Ictinus, and Mnésicles Calli-crates or Libon. If those great men could have visited Paris, it was imagined they would be surprised at nothing in the Madeleine or the Bourse except the scale of the buildings, and would have recognised in them not only the general dispositions of a Greek temple, but the special forms of each member, and, above all, the intelligence in disposition, the sentiment of harmony and proportion, and the fine taste which imparts tone and character to a style. A glance at the remains in Greece itself, by a few travellers, was sufficient to dispel the illusion. By a single authentic example it was demonstrated that in the great divisions of the composition, the proportions and the profiles, a Greek monument was without any resemblance to the buildings that are strewn over the surface of Latium. It was then found that Roman art, when compared with Greek art, was like the translations of Dacier, which, although said to be noble and generous, had been allowed to disfigure Homer for many years. It was soon found that the Roman Orders were not even a direct translation, that they were not derived from monumental styles of Greece during the age of Pericles, but from buildings in Eastern cities, which had been Hellenised by Alexander: in Pergamus, Cyzique, Antioch, Rhodes, and Alexandria rather than from Athens, the origination of the Greco-Latin must be sought. Finally, the discovery was made that Vitruvius, whose opinions were accepted in the blindest faith, knew no more of the architecture of Oriental Greece than was to be derived from books, and the prince of architects assumed his rightful position, that of a compiler from Alexandrian theorists. It was no longer astonishing to find him asserting that the ancients never employed the Doric Order in their temples, although the Parthenon happens to be Doric; or that temples should be so disposed as to allow the statue to look westward, although those found in Greece proper have all an eastern aspect, save one having its axis from south to north, and other absurdities. Evidently Vitruvius rarely quitted his library, and his studies were confined to the text of Hermogenus or other architects who had lived subsequent to the age of Alexander. In order to understand Greek art in its finest period, it is requisite to set aside so maladroit an interpreter, and to study such works as time and men have spared to us.

#### The Theatre of Pompey, Rome.

R. BURGESS.

This theatre reached its greatest splendour in the time of Nero. Two vanquished chiefs, who came from the north of Germany to render submission to the Emperor, were taken to Pompey's theatre in order that they might see the greatness of the people. It contained, according to Pliny, 40,000 spectators; and when Tiridates, king of Armenia, came to Rome, Nero caused the whole to be gilded, to show off the magnificence of

the Romans to the vanquished Asiatic. It passed through a succession of events until Theodorus commissioned Symmachus to rebuild it; but not long after it shared the fate of the rest of the splendid edifices of Rome, and finally came into possession of the Ursini family, who occupied that quarter of the city in the wars of the Middle Ages. In the fifteenth century an inscription, found with the name of Pompey, directed the antiquary to find out its site. Another indication of the place where this theatre stood was given in the finding of the famous statue which is now in the Palazzo Spada. That statue was found under the partition wall of a house, and lying across in such a way as to give two proprietors of the house a claim to the treasure: not able to agree about dividing the spoil, they came to the conclusion of cutting Pompey in two, and each man taking his own half. The matter having reached the ears of Cardinal Capodifezzo, he hastened to Pope Julius III. to inform him of the judgment that had been pronounced upon the statue. The astonished Pope despatched a messenger with all haste, and sent 500 scudi to be divided between the litigants, instead of Pompey. Flaminio Vacca, who relates this anecdote, says the statue was found near the Palazzo della Cancelleria, in the Vicolo dei Scutari. The statue did not stand in the theatre, but in the curia which Pompey built as an appendage to it, and the belief still obtains that it is the statue at the feet of which Cæsar fell. Being thus directed to the site of this famous building, we find ourselves in the immediate neighbourhood of the church of St. Andrea della Valle. From near that church to the Palazzo Pio the site is marked by a gradual rising of the ground, but no vestiges meet the eye. In order to see the remains of Pompey's theatre, we enter the courtyard of the Palazzo Pio, and descending into the vaults upon which the Palazzo is built, we find ourselves, at the depth of 40 Roman palms, among the foundation arches. These have been originally hollowed out of the natural rock, and they are pointed at the angles with large blocks of peperine stone. One of the cunei or sections of the cavea belonging to the lowest tier may be perfectly traced; and after ascending to the courtyard again, and upon entering the stables, we see a second storey of arches for supporting the seats, the construction of which is remarkable for its solidity; and it would not be difficult to trace, among the modern buildings and in the cellars of the Palazzo, at least one-half, perhaps two-thirds, of the whole cavea. Vitruvius cites the Porticus Pompeiana as an example of what a portico should be when attached to a theatre for the convenience of the actors, or for the people to take shelter in in case of rain. We know, from Martial, that Pompey's portico had a hundred columns. Eusebius calls it, in consequence, "Hecatonstylon." This celebrated portico was painted by artists of renown—Antiphilus, Pausias, and Nicias—the subjects being suited to the atmosphere which Ovid's lovers breathed.

#### Sea Water and Iron.

W. REID.

Almost everyone has observed pebbles adhering to old anchors which have long lain under the sea. Engineers who have had to remove piles from sea walls or harbours have also noticed similar effects, for the iron shoes at the points of the piles have generally a mass of pebbles strongly encrusted around them. Even in what we call fresh water (but which on analysis always is found to contain salts in solution) this effect in a smaller degree is observed. Having had occasion to reset part of what are called breakwaters at Portsmouth, which are covered every tide by the sea, I was there enabled in many instances to notice the effects here alluded to. Some of the examples afforded beautiful specimens, and of several varieties, of the carbonates of iron of perfect forms. When examined with a powerful lens very delicate needle crystals were often distinctly visible; these last which I observed were white. Those resembling carbonates of iron varied from black to brown, and to bright yellow: some of the browns were of a very rich colour. These specimens were not found at Portsmouth only; at Hurst Castle planks of considerable dimensions, which the gales had broken from the groins, were found firmly encrusted with silicious pebbles. It was not at first easy to discover from what cause the pebbles adhered to the wood, but on sawing a plank longitudinally it was found to have been driven full of iron scupper-nails. The flat beads of these nails were almost touching each other; the heads had nearly disappeared, and in their place a black shiny crystalline matter had been formed, which firmly united a layer of pebbles to the plank. The opinion I formed on this was that voltaic action takes place between the metallic iron and silicious pebbles when immersed in sea water. If this be the case, we can scarcely doubt but that something of the same nature will occur between iron and other stones when similarly placed. Part of the breakwaters at Portsmouth were set with very thin sheet-iron, between blocks of Swanage stone, as an experiment. In a month afterwards sand and small pebbles were found firmly fixed between the iron and the stone, and black crystalline matter, such as had been found at Hurst Castle, appeared forming, and the experi-



ment, as far as it has been observed, seemed satisfactory. After thus setting the breakwater with stones, alternating with plates of sheet-iron, I observed that Mr. Cross had previously pursued studies somewhat similar, and he was satisfied that iron, when in contact with silex in a fluid medium, exhibits electric phenomena. An observation to this effect will be found in Mr. Leiths's work on electricity. The subject of the formation of crystals by voltaic electricity, which is one of great interest, is now making considerable progress, and the object of this paper is to endeavour to show that the pursuit of the study may be practically useful when applied to hydraulic works, and that it well deserves to be ascertained whether plates of thin iron, alternating with stones, and placed under the sea, will not be found to form solid rock, with crystalline veins. Mixtures of iron filings, sand, and gravel, let down to the bottom of the sea through tubes, might perhaps consolidate and form a stable foundation for lighthouses and other works, for which it is very difficult to form a base. Those parts of the Portsmouth breakwater set with the thin sheet-iron will be found between the Saluting Battery and the Spur Redoubt, and are visible on close inspection. The experiment has been varied, somewhat in the manner above alluded to, by the authority of the Admiralty. Unserviceable iron water-tanks from ships of war have been filled with gravel, mixed with iron turnings and a small quantity of lime, in the construction of a groin opposite to Haslar Hospital. The greater part of this groin will be covered by the tides, and thus a good opportunity will there be afforded of observing the effects of iron in contact with pebbles when immersed in salt water.

#### Art and Society.

DAVID SCOTT.

Art—we use the term in its inclusive signification—stands connected with the movements of society in a double relation. It influences, and is influenced by, them. It gives impulse to and at the same time follows, those movements—the one from its ultimate adherence in, and value in relation to, the intimation or awakened operation (particularly in its highest or most worthy departments, but in all, to a certain extent, even by its specific nature) of those elements of the mind which are most humanising or most essentially establish the distinction of humanity in man; the other by frequently deriving its forms and clothing from those changes which pass over, or rather in themselves constitute, the visible enudation or detailed features of his mental being as displayed in society; changes, the “equal step” of which are often as much beyond the reach of scrutiny and the control of established systems of laws and elaborated institutions, which, instead of directing, usually intimate the departure of the passing spirit, and cripple often its footprints, as the passage of an epidemic, a year of plenty, or of dearth. In its origin, art is antecedent to the varied modes of life, while in the manner of its announcement of sentiment it is frequently sequent to them. The effects which it produces are the result of its progression from sources which are pervading, and not liable to be dried up; it serves as a perpetual record, intimation, and renewal of the youth and strength of the mind, keeping alive the verdure of the soul. But opposed to this—its virtue or distinctive value—by the forms of society by which it is operated upon, it is not unfrequently thrown into ranges of expression which sufficiently exhibit both the impress of these forms, worthless as they are at times, and its liability to be brought into connection with subordinate and fluctuating purposes in all their variety. Two diverse positions are thus occupied by art and established in respect to it: the one primary and holding a direct connection with the mind; the other still necessarily exemplifying the manifestation of particular portions of the mental constitution, but in accordance with their combinations displayed in other it may be more subordinate or more extended features of society.

#### Mediæval Love of Colour.

L. VITET.

Painting being more perishable than sculpture, it was inevitable that the remains of works by Mediæval artists should be very few and imperfect in condition. I am speaking, of course, of monumental painting on stone or fresco, for what is known as painting nowadays, that is, the painting of pictures, was not contemporaneous with the architecture and the sculpture of the Middle Ages: it appeared at a later time and followed a road apart. The precursor for it is to be found in an art that is now lost—the illumination of manuscripts. It is solely upon the parchment of the missals and the coloured psalters of the cloisters that we must seek what in the twelfth, thirteenth, and fourteenth centuries corresponded most nearly with our easel pictures. There is much in that form of Mediæval art which makes it most interesting for the student, for we find an imagination that was rich and bold displayed in the fantastic borders of the illuminations, design that is sometimes piquant, drawing that faithfully represents the usages and costumes of the time, and colours that are excellent as regards preparation and laying on; but, with all these qualities, we

cannot regard the illuminations as representing the painter's work of the Middle Ages. For what relationship can be found between these masterpieces of patience, these microscopic drawings, and the great monuments of architecture that seem to be the work of giants rather than ordinary men? It should not be forgotten that in Mediæval days society consisted of two worlds, that were separated and differed one from the other. One was all study and patience, the second all action and courage. In the cloisters the inhabitants spoke a dead language, in the castles and fields the language was an idiom young and vigorous. While the painters in the monasteries amused themselves with fixing minute quantities of gold and colours upon leaves of vellum, the wall-painters, the veritable painters of that age, who were the rivals of the architects, the sculptors, and the carvers, proceeded more boldly, and spread their gold and colours in arabesques and figures upon the walls and vaults of churches and châteaux. We cannot comprehend the art of the Middle Ages, and must form an imperfect idea of the grand creations of the architecture and sculpture of that time if we do not picture to ourselves the buildings and the figures covered with gold and colours. Of all the importations from the East, not one was accepted with so general a favour as the taste and the necessity for colour. The people wished to see everything coloured, even light itself, and the sun's rays henceforth penetrated into habitations through yellow, red, and blue. Stained glass could have had no other origin: it was the natural consequence of the new system of decoration, and of the passion for colour that was derived from the East. In the seventh and eighth centuries, in the beginning of the ninth, and in the eleventh century that passion made some conquests, but they were partial, and did not long endure. After the return of the Crusaders colour triumphed, and during three centuries France was amorous of it, as Greece had been at all times.

#### Thirteenth-century Glass.

G. E. STREET.

Glass in windows ought to be transparent and brilliant, and it can only be used properly in separate pieces leaded together, each piece of colour being on a distinct piece of glass; it must, therefore, be a mosaic, and cannot attempt to vie with the free work of the painter's brush on walls or canvas. Its most marked qualities must be brilliancy of colour, transparency of effect, and distinctness of outline. In these qualities no other vehicle can rival it, and true wisdom consists in using it most for those purposes for which it is most fitted. The attempt to imitate wall-paintings which has been often made of late is, from the nature of the material, sure to fail, and will in course of time fail still more signally than it has when decay sets in, as it will in such complicated work much sooner than in a mosaic of properly coloured material, such as the early painters used. The one is of necessity perishable and not thoroughly transparent, the other may be said to be truly indestructible, and is perfectly transparent. The mosaic mode is therefore that which seems to be the true and proper one, and the early painters may be said to have been fortunate in knowing of no other. Their glass is generally either extremely rich in gorgeous colour, or of the simplest kind, painted with delicate trailing patterns of foliage on a white ground. In the former the tints used were extremely brilliant, and the whole detail of the richest possible description. The artists regarded their work rather as intended to conduce to the general tone of colour in the building, than to teach people in the way in which a picture on a wall might teach them. It is true that their windows in churches are often full from one end to the other of figures or subjects painted in a most elaborate way. It would have been impossible, indeed, to dispense with “subject” windows; but, on the other hand, they were evidently designed much more with a view to gaining the greatest amount of general effect, than to producing the prettiest or most intelligible picture in one spot. If you were to examine most of the best of the thirteenth-century glass, you would see that the whole of the design and the mode of drawing are made entirely subservient to the requirements of the material. The foliage enrichments are drawn with great power, untiring patience, and marvellous intricacy; the figures are rude, as might be expected at the hands of men who had seldom if ever thought of studying from the life, but they were always drawn with an honest desire to make them tell their story, and with a vigour and distinctness of action which cannot be too much praised. If then, after looking at old glass, you were to examine the modern imitations of it, you would find them startlingly deficient in almost all the good qualities of the former. The material used is thin and poor in tint; the drawing, in trying to be correct, has become tame and insipid, and the arrangement of colour shows generally but little appreciation of the right mode of producing effect. So that here, as in almost all other matters, thirteenth-century art, tried by the test of critical examination, comes out from the ordeal unscathed, whilst the work of our own days appears to be scarcely art, but rather a habit of thoughtless compliance with what is supposed to be the taste of the day.



## NOTES AND COMMENTS.

THE illustration we publish to-day from COTMAN'S drawing is the first of a series that will suggest his skill in all the branches of work which he attempted. At one time copies were made in lithography from COTMAN'S drawings for the Government art schools, but they were only translations. The plates we propose to publish, being produced by photography, come far nearer to the originals, and will reveal his whole manner of working. We trust they will serve in making COTMAN'S name a household word in England, the Colonies, and America.

THE selection of M. CHAPU as the sculptor for the statue of HONORÉ DE BALZAC, although approved by Frenchmen, has caused bitter disappointment to M. MARQUET DE VASSELLOT, who for twenty years has had one fixed idea, viz., that he was destined to make a statue of the novelist. The committee having charge of the subscriptions avoided a competition, and sought a sculptor by visiting the *ateliers* of a select number of sculptors, and discussing the subject with the owners. Finally, it was considered that the wisest course was to offer the commission to M. CHAPU. The decision dispelled all M. DE VASSELLOT'S dreams. He had prepared himself for the work by making four or five busts of BALZAC, he had made models of a memorial, and had so constantly studied the novels that he considered himself confident to create figures of at least three hundred of the characters. M. DE VASSELLOT would not be called a very successful sculptor, for he has obtained few medals, and, when an artist has formed a definite plan as he did, he is not likely to care about any other. For M. DE VASSELLOT believed that if he could make his mark by the monument of BALZAC, then the future was secure. The committee having failed, the sculptor has turned to his successful rival and has put the circumstances before him with an appeal to his generosity. To a man in M. CHAPU'S position, what is one monument more or less, while the victory means loss to M. DE VASSELLOT and misery to his family? In a case of the kind, what is to be done? If M. CHAPU gave up his commission, would the committee give it to the sculptor who was so eager to obtain it? Many claims might be set up, and the task of the committee would become oppressive. The narrative recalls the disappointment which was felt by BENJAMIN HAYDON under similar circumstances. All his life he was insisting on the duty of the State to give commissions for mural pictures, and he was dreaming of the time when he was to receive them. His joy was great when it was announced that the Houses of Parliament were to be adorned in that way. He took part in the competition, and the smallest prize was not awarded to him. M. DE VASSELLOT is, therefore, not the first artist who has been foiled in the ambition of his life.

THE collection of cartoons, designs in oil and water-colours, studies, models and photographs, which constituted the monumental art section of the Brussels Exhibition, should have been acquired for this country, where so little is known about the decoration of public buildings. The opportunity has vanished. The Belgians have secured the collection, and it will form the nucleus of a permanent museum of monumental art. There are many artists in Belgium who are skilful as decorators and in mural paintings, but it is felt that, with so important a branch of art, it is wise to be acquainted with the best works of Frenchmen, Germans, and Austrians. Having a Civil Service that is remunerated according to the value of the work done, Belgium is able to expend large sums of money in works of art. We are far richer in England, but as long as the official world absorbs so much money as it now does, we must suffer, and see most desirable works carried off by rivals.

It is reported that Professor KOUDAHON, the Russian archaeologist, has been fortunate in his explorations in the Chersonese. He is said to have found some fifty ex-

amples of Greek terra-cotta which belong to a period of about three centuries before the Christian era. They are considered to surpass in beauty the figures that were dug up at Kertch. There are statues of APOLLO, BACCHUS, and PAN, mythological groups, masks, heads, and medallions. It is supposed they were not imported from Greece, but were produced by Grecian artists who lived in that part of the Crimea.

MR. EWAN CHRISTIAN has offered the following suggestions to the School Board for London, but they are no less worthy of adoption as canons of administration by School Boards and building committees throughout the country:—  
(a) All questions in respect of quality and depth of foundations to be finally settled, and the work, if differing from the drawings, measured and agreed, and extras and omissions balanced, within one week after its completion up to the level of the ground damp-proof course. (b) That similarly all questions in respect of variations, extra works, and omissions on the carcass of the building above the level before mentioned, shall be settled immediately after the completion of the roofing in, and the building of the chimneys, and before any plastering whatever is executed. (c) That all questions as to the drainage shall be similarly examined into and settled, and the drains tested, before the trenches are filled in. (d) That in like manner all questions as to minor buildings and boundary fence walls shall be similarly adjusted and settled up to the fixed level of the damp-proof course. (e) That all fence walls uncovered by roofing, built between September 29 and March 25, shall be carried up wholly in cement mortar. (f) All pointing of joints to be finished as the work proceeds. (g) All building of gable and parapet walls and chimneys above the roof to be carried out in cement, and that in every case of a new building builders giving tenders shall be required to state the additional cost of building the whole of the work in cement under the conditions laid down in the specification. (h) No surface cut or rubbed brickwork to be used. All mouldings and strings, where introduced, to be of moulded bricks of the best and most durable quality, and all projecting joints filled in with cement. (i) Any cornices or string moulds requiring it to be covered with lead, and the use of zinc for that purpose to be finally abolished. (j) No ornamental work whatever of a perishable quality to be anywhere introduced into any of the school buildings erected by the Board.

COMPETITION often helps to produce good work, but in the case of archæology it cannot be imagined that much is gained by the rivalry of societies. Mr. JOHN HONEYMAN is therefore expressing an opinion which is held outside the societies, if not in them, when he says that "we have arrived at such a stage in several lines of research as to make some well-organised scheme of co-operation a necessity, if we would avoid wasting of energy and gain further substantial progress." If the various archæological societies will only count their gains during late years, they must admit they are not progressing. What is more curious is that people are taking less interest in archæology. Mr. HONEYMAN says there should be "an association of all the archæological societies in the country, so to organise the archæological work of the country as to turn it to the best possible account. The task ought properly to be undertaken by the Society of Antiquaries; but it is needless to expect that—the more's the pity. Failing the Society of Antiquaries, the British Archæological Association might perhaps take it up as their exclusive function, apart from their annual congress, which would go very well along with it." Better still would be the creation of a new association in which the various provincial societies could combine. Very little is done for archæology by dwellers in the metropolis; the Society of Antiquaries is degenerating more and more every year, and the British Archæological Association has lost its influence. It is to the provinces we must look for a revival of archæology, and any society that proposes to be useful must recognise that fact. Reunion of provincial societies would not be a difficult task, nor the agreement in a common course of action.









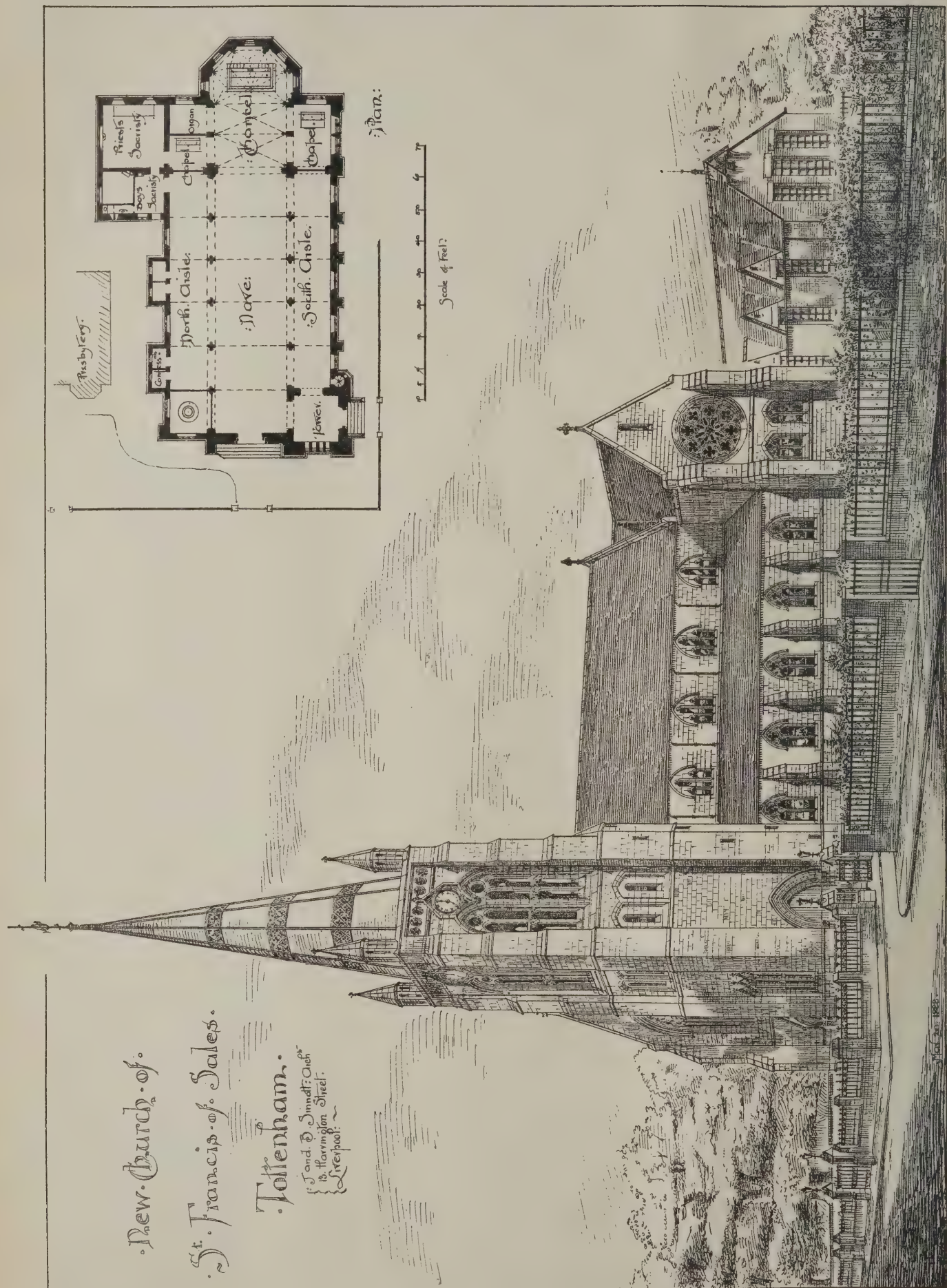
ST GILLES, CARD.

From a Drawing by A. NEEDHAM WILSON.







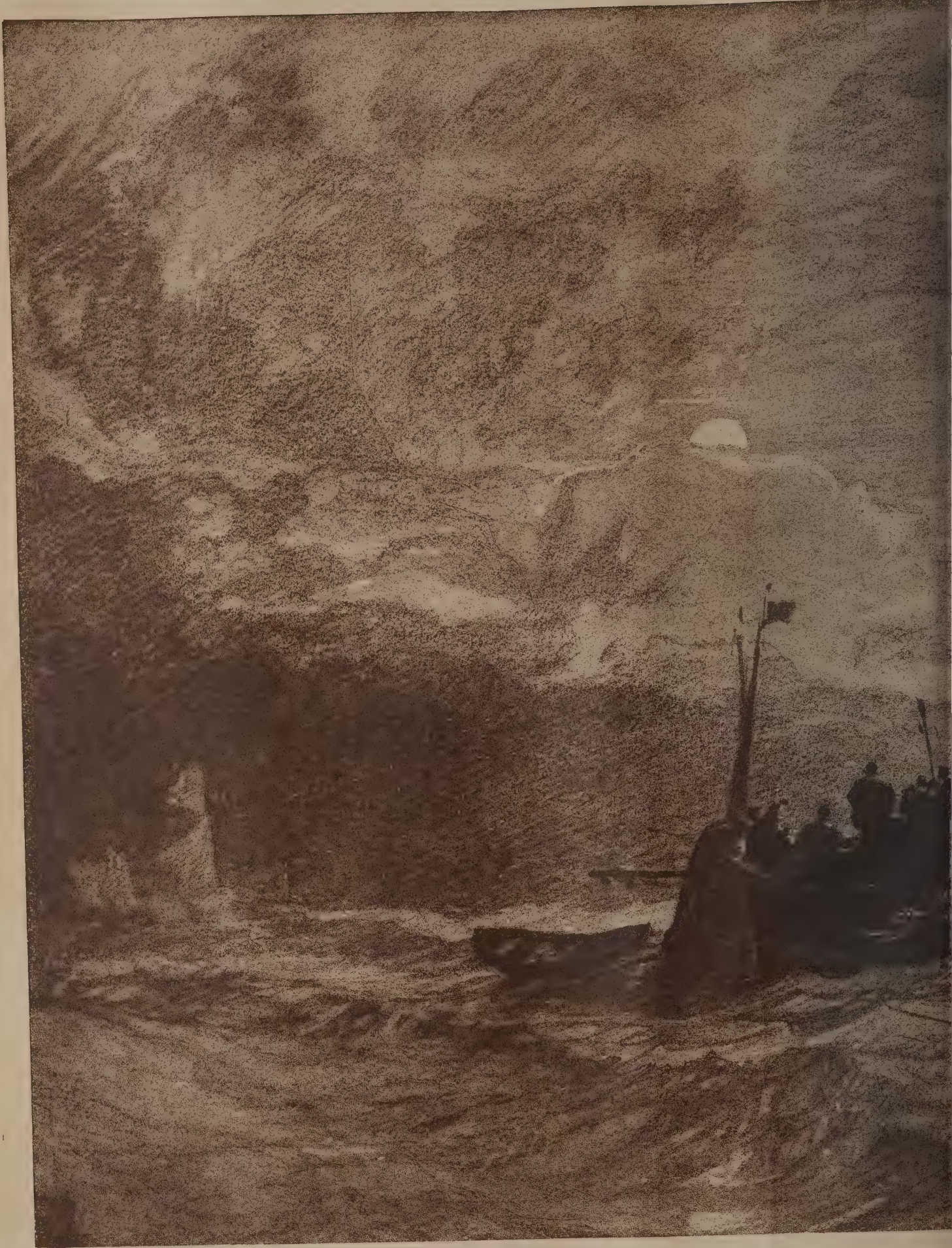


New Church of  
 St. Francis of Sales.  
 Tottenham.  
 { J. and S. Simmet, Archts.  
 18, Harrington Street,  
 Liverpool. }









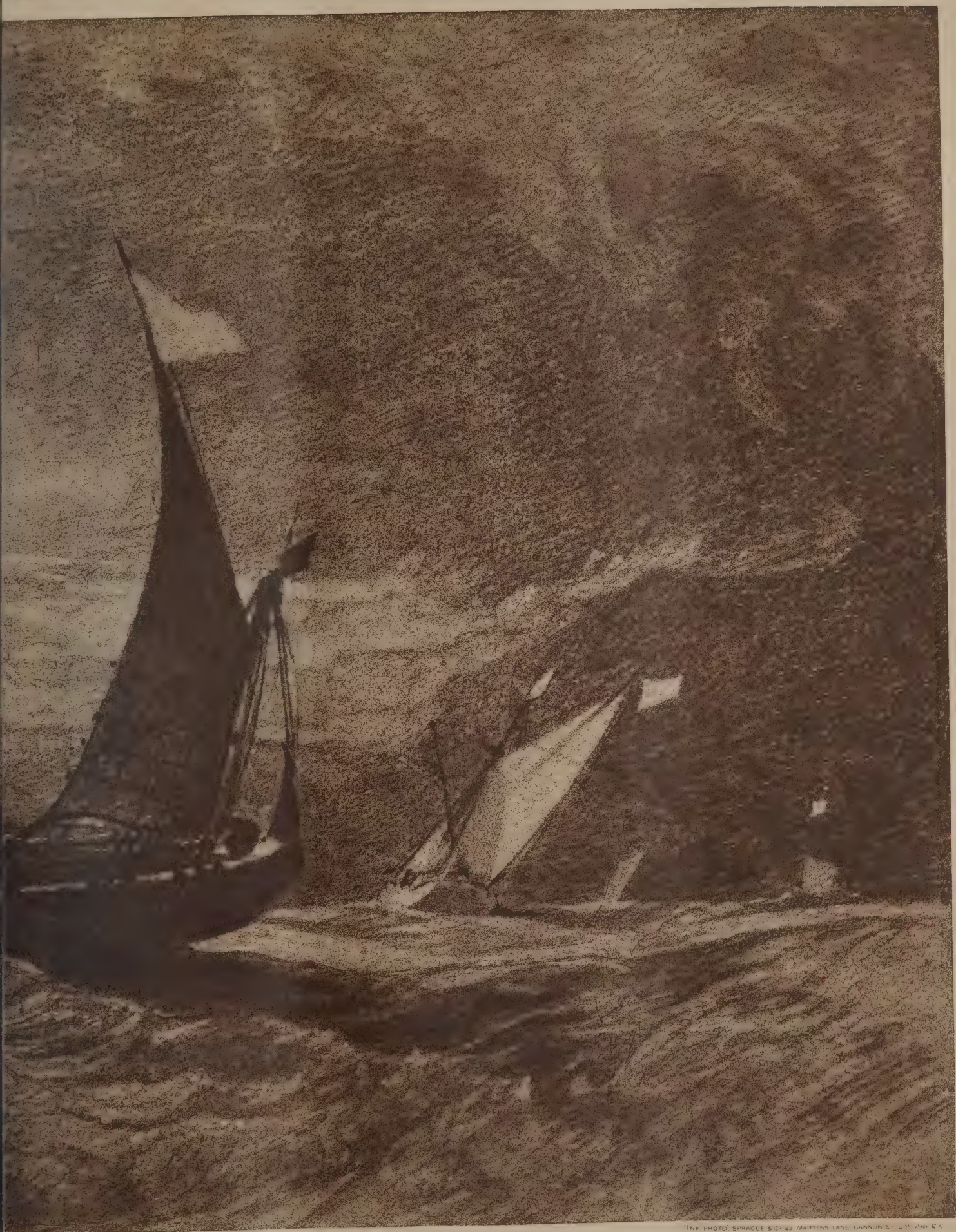
STORM AT

by J. C.

From the Drawing



23 1888.



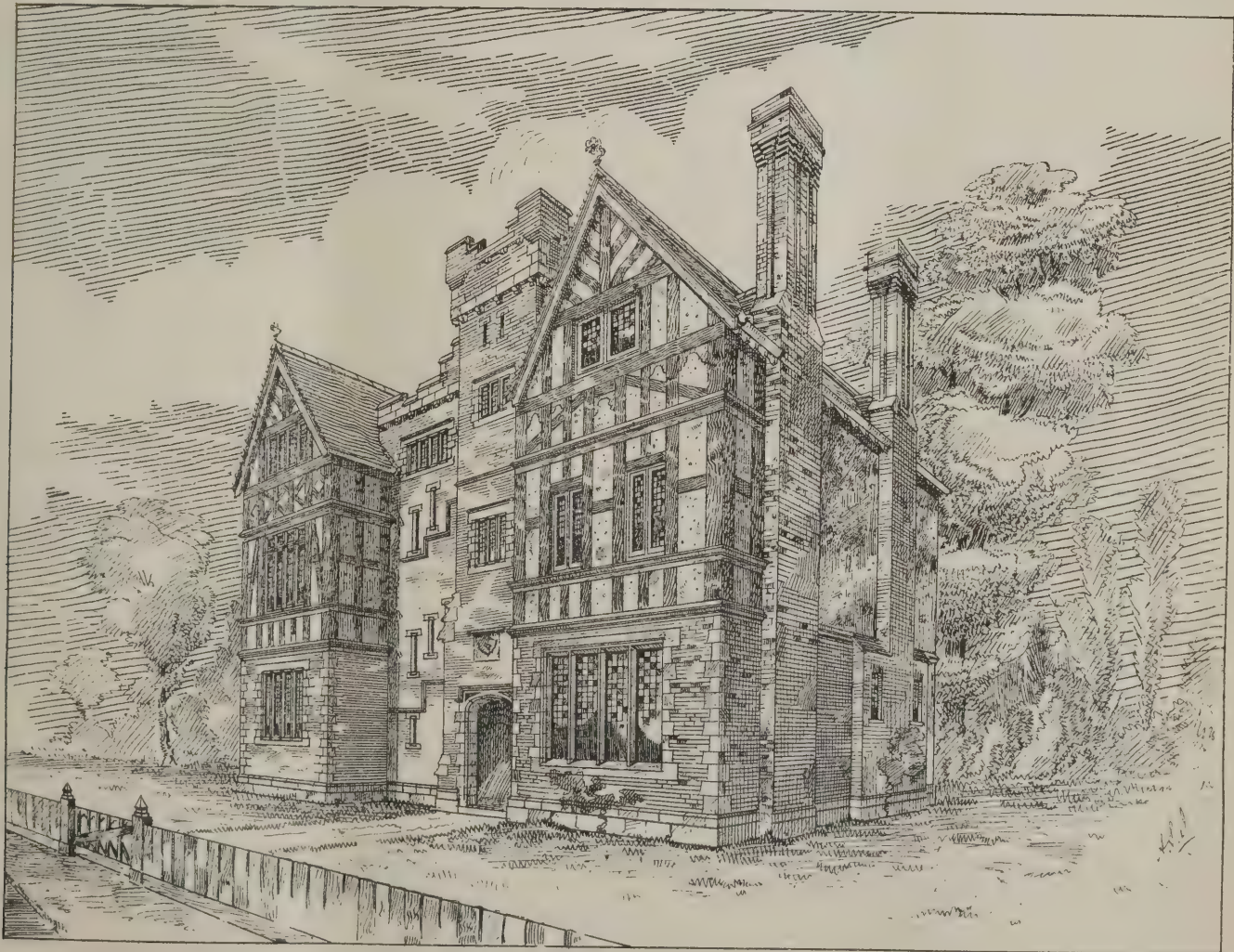
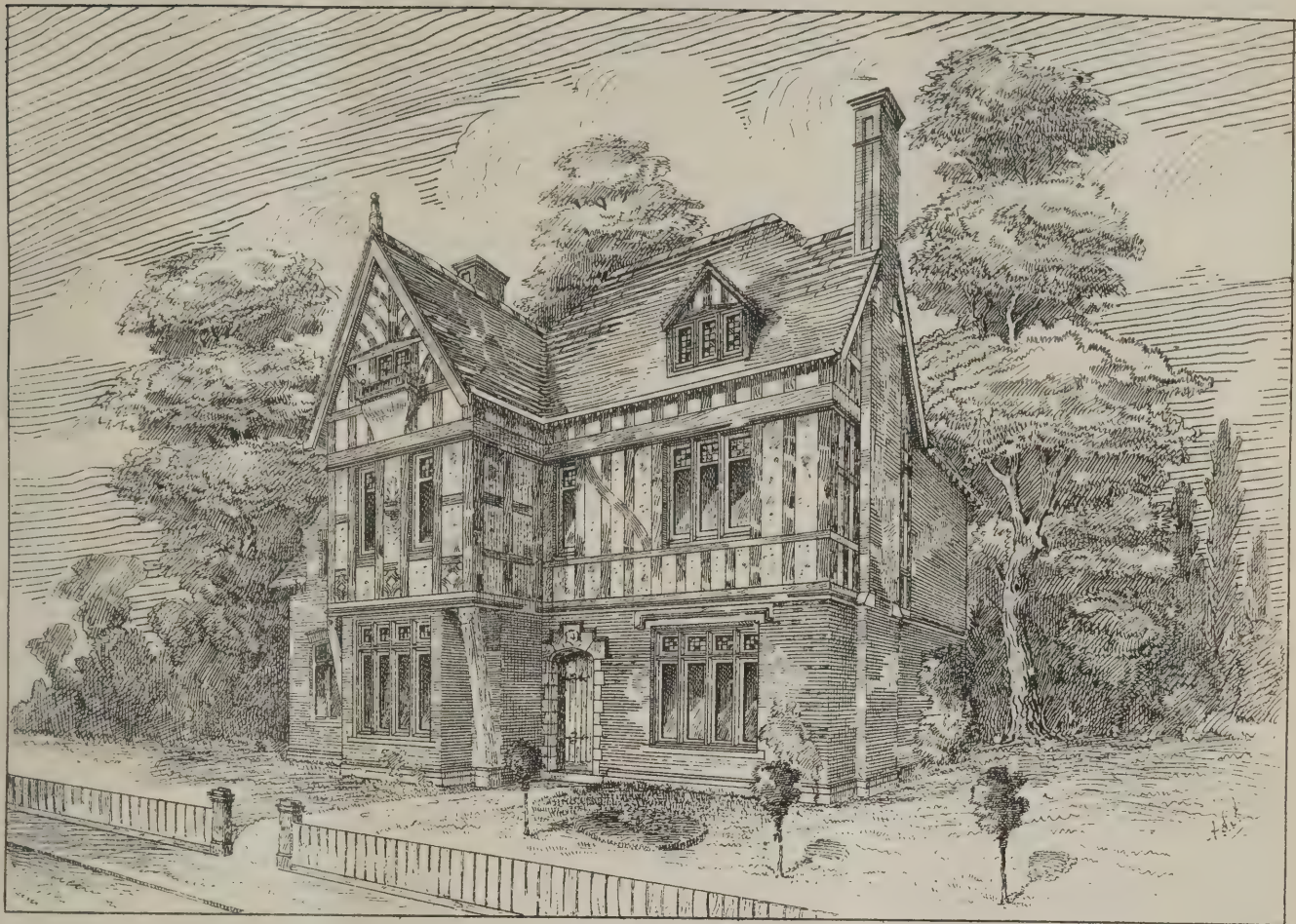
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A.-MOONLIGHT.  
SELL COTMAN.  
Belonging to James Reeve Esq









HOUSES BROMLEY PARK, KENT.

W. A. WILLIAMS, Architect.

Printed by Sprague & Co. 44 Martin Lane, London E.C.









ARCH AUGUSTA, PERUGIA.

from a Drawing by J A SLATER.







## ILLUSTRATIONS.

STORM AT SEA—MOONLIGHT.

THIS illustration is reproduced from a drawing by JOHN SELL COTMAN, the Norwich artist, whose works are now obtaining more attention than formerly. The original belongs to Mr. JAMES REEVE, of Norwich, to whom we are indebted for its use.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 42.—ST. GILLES, GARD. [A. NEEDHAM WILSON.]

NO. 43.—ARCH. AUGUSTA, PERUGIA. [J. A. SLATER.]

NEW CHURCH OF ST. FRANCIS OF SALES, TOTTENHAM.

THIS church is about to be erected on a very fine site in the High Road, in front of the existing school-chapel. The walls are to be faced with coursed walling of hard stone, with Bath dressings, and the roofs covered with green slates. The spire, 140 feet high, will be constructed of timber and leaded. Bath stone will be used inside, excepting the clustered columns of the chancel, which are to be of marble. These latter will carry a groined timber roof as well as the arches springing from the same level. The nave will have a segmental timber vault, with moulded transverse ribs and cornice. The flooring is to be of wood blocks and marble mosaic. There will be sitting accommodation for about seven hundred persons. Messrs. J. & B. SINNOTT, of Liverpool, are the architects.

TWO HOUSES, BROMLEY PARK ESTATE, BROMLEY, KENT.

THESE sketches illustrate two houses just finished on the estate of Mr. S. CAWSTON. They are situated in an elevated and well-wooded position, commanding a view of Shortlands Valley. They are built of a sharp red brick, with Bath stone dressings and tiled roofs, the upper storeys being of half-timbered work, filled with cream-coloured rough cast; the pillars and doors being of oak. They were erected from the designs of Mr. WALTER A. WILLIAMS, architect, Bromley and London; the builder being Mr. A. J. ECCORDT, of Bromley.

## PROGRESS IN CONSTRUCTION.

IN the course of his presidential address before the Society of Architects at the Arts and Crafts Exhibition, Mr. Seth Smith spoke on this subject as follows:—

I will now glance at the past year's advances in construction, fittings, and such like branches of our work. To take building materials first. Pink terra-cotta, as hard and sound as the best buff, has been difficult to obtain until quite recently, but is now being made successfully. Manufacturers are also succeeding in getting all terra-cotta truer in shape and freer from cracks, and it is a far more reliable material to-day than it could be said to be hitherto. Architects are designing their work to avoid the large unwieldy blocks with which there was so much risk. This year has seen greatly increased demand for terra-cotta and also for facing bricks in terra-cotta clay; the latter are finding their way into several places where they were never used before, Ireland, Scotland and the south coast of England, and I am told that a very large consignment of red terra-cotta bricks has just gone off to Egypt.

Considerable progress has also been made during the last year in the production of glazed bricks that are soft and good in colour, and absolutely impervious to all atmospheric influences, the body of the colour and the glaze being made an essential part of the brick, so that neither colour nor surface will be affected by damp or frost, and it will sustain a severe crushing strain. I must mention also a rich brown-yellow terra-cotta in which the lines and arises can be made almost, if not quite, as true as stone; buildings in this material are to be seen in Piccadilly Circus, and it has also been selected for the New Métropole Hotel, at Brighton, on account of the warmth of its colour and its impervious character. I am also informed that in connection with some work for the Museum of Science and Art, at Dublin, great technical accuracy has been secured in carrying out some Lucca-della-Robbia faience work.

Marble as an internal wall decoration is being more largely

used every year; one has only to visit, among the latest buildings, the National Liberal and the Constitutional Clubs, the National Gallery, and the Gallery in which we meet to-night, to form an opinion as to its suitability for such purposes. In a few of the more recent important public works steel box girders are adopted of considerable span, carrying loads of enormous weight. Rolled joists and joist girders are also being made of steel, but not in very large quantities; iron is much cheaper and suits most purposes perhaps even better than steel. The steel used for constructional purposes is that termed "mild," and equal to an ultimate tensile stress of 30 tons per square inch. This result, when compared with the iron value of 4 or 5 tons per square inch, shows an immense advantage in favour of steel. The saving in money, however, is very little, if anything, as reliable steel is dearer than iron. The principal advantage lies in the fact that for carrying heavy weights steel girders may be made so much lighter than iron, and then a great saving in carriage, hoisting, and fixing is effected when the quantity is large; the same consideration also applies to the use of steel cylindrical columns and steel joists; but it must not be lost sight of that steel constructions are not likely to stand so well in cases of great heat. It is to be regretted that, notwithstanding several attempts by English firms to roll iron joists, they have been constantly beaten, both in quality and price, by the Belgian makers. English manufacturers who could supply iron joists at or a trifle below Belgian prices would confer a great benefit upon the country. The demand for steel joists has been better met in England, although at prices above iron. To ensure both the specified quality of iron and the proper construction, it is always best to have it tested on the site; the cost is comparatively small, and, as a rule, it is quite practicable.

Any such review as this would be inadequate which omitted to mention the admirable system of fireproof flooring now in the market, which, though not quite new, has been improved in various ways during the past year. I refer particularly to the pumice concrete flooring for bearings up to 20 feet. It consists, as you are aware, of rolled steel or iron joists spaced according to the loads to be carried, filled in between and entirely embedded in this pumice concrete with a uniformly flat soffit. This material is 25 per cent. lighter, much more sound and fireproof than ordinary concrete, and can be nailed to as easily and effectually as to wood.

Another great advantage of this system is that the iron joists are interlaced with strained trussed wires, about every 18 inches, which gives great homogeneity and toughness to the floor and prevents fracture by settlement. I am assured that no expansion or contraction takes place in such floors under any circumstances.

Where time is an important factor, pumice concrete slabs are laid dry and afterwards grouted in with cement. The well-known steel trough flooring is being more than ever used for larger spans, and various methods of fixing the wood floors above, and the ceilings beneath the steel channels, are novel and ingenious.

This fireproof construction has been used within the past year for roofs, no fillets or boarding having been necessary, but felt is laid on a floated surface and the lead rolls screwed to the concrete.

Unless one, or at any rate a thoroughly congenial mind directs at once the structure, its fittings and decoration, a really harmonious result cannot be expected. As to advance in the decorative world I will content myself with the quotation,

"Si monumentum requiris, circumspice."

Among fittings, stoves and chimneypieces deserve the first mention.

There is a strong disposition to make more use of the open recess and dog-grate in the reception-rooms. No doubt this arises from the artistic and varied treatment of which they are capable; they are not economical in fuel, or equal in heating power to other forms. If, however, the sides of the recess are splayed, the stove set close to back of recess, and the register is made as long as the opening and placed well back, the soffit of arch or lintel being rounded off to it, the result is generally satisfactory. I have found it very important, in order to ensure success, to allow the makers to fix their own fittings. For inexpensive buildings cast-iron chimneypieces are being more than ever used on account of their great cheapness and durability, while many firms are doing much to improve their design.

It pays well, when doing up old houses, to fix plain-coloured glazed tile-hearths and fenders throughout, both as a saving of labour, to say nothing of appearance and cleanliness.

We now come to the important subject of artificial lighting. The extension of the electric light must to a large extent depend on the successful formation of central electric lighting stations, as in this way electricity can be obtained by householders in the same way as gas, the company bringing their mains to the doors and supplying suitable meters to consumers of the current.



In America, central station work has of late increased enormously. In London, Sir Coutts Lindsay, otherwise the "London Electric Supply Co.," has hitherto been practically the only company supplying electricity from a centre; but another company, "The Metropolitan Electric Supply Co.," has recently been formed, with some of the most powerful financial men connected with submarine telegraphy as directors, whose intention it is to deal with the question of the supply of electricity thoroughly and efficiently. But, besides this, there have been several other smaller companies formed, such as the "Chelsea Electric Light Company," working under license in the Chelsea district. "The Kensington Court and Knightsbridge Electric Light Company," "The Cadogan Electric Light Company," and the "House to House Electric Light Company," who are putting up their first station in South Kensington.

The coming year will undoubtedly work a very great and important advance in the supply of electric light, as, I presume, these companies will by that time be in a position to supply large areas.

In many of the most important provincial cities and towns great stir has already been made, and various electrical lighting companies are projected. The change is made by the Board of Trade unit, viz.—1,000 watts—and in most cases the price is 7½d. to 8d. for such a unit; 7½d. per unit would work out at about a farthing per 8 candle-power lamp, and is somewhere equivalent to 4s. per cubic feet of gas. Various meters have already been devised for ascertaining the consumption.

With regard to how the lamps should be disposed for electric lighting, suspension lights at a suitable distance from the ground, with clusters of three or five lamps in each, appear to answer best; large clusters of lamps on an electrolier are wasteful. Single lights, on the other hand, leave a general effect of insufficient light.

The ceiling lighting is being altered at one of the largest London clubs, as it is found to be so wasteful of light. The incandescent lamps are at present retailed at from 4s. to 5s. each. I understand there is a possibility, should the Edison Swan Company lose their case in the Court of Appeal, that the price may be reduced to 1s. 6d. to 2s. per lamp.

I am often asked how will the development of electric lighting affect the great gas companies. It is difficult to prophesy. At present there is no appreciable falling off in the demand; and the announcement from the Gas Light and Coal Company within the last few days, that they are about to lower the price, will handicap electric lighting more than anything. Up to this time, where the electric light has been installed, it has generally necessitated the use of a powerful gas engine, which has consumed nearly as much gas in the production of electricity as would have illuminated the building, but the central station system will alter all this.

It must, however, never be lost sight of that, perfect as is the electric light for the purpose of illumination and as giving off less heat, it lacks the great power existing in a gas flame—properly controlled—to ventilate an apartment. I should, therefore, not be surprised if a combined use of gas for cooking, warming, and ventilating, and electric light were for this reason to become more general.

The Cromartie and the Wenham gas light are very economical consumers of gas, and if their flues are kept regularly swept and they are hung in clusters to obviate the shadow they otherwise throw upon the ceiling, they are very powerful and specially adapted for the dual purpose of light and ventilation. The clever Welsbach gas light is the most economical of all in point of consumption of gas, and being a Bunsen burner the combustion is as perfect as possible, and the injury to decorations, &c., consequently very small as compared with all others.

Electric lighting has revolutionised the old gaseliers and brackets, and well illustrates the effect of science on art. Great credit is due to the leading manufacturers for the development of beaten copper in the foliated parts; copper is too soft constructionally but harmonises beautifully with brass. One great principle in all artificial lighting is to have no naked burners, but to diffuse the light through ground glass or silk.

Wrought-iron, the beauty of which was suddenly appreciated seven or eight years ago, is daily improving in design, more especially under the hands of several excellent firms. Many architects are now having their door locks, handles, sash and casement fastenings, stays and bolts, &c., specially forged. Few details better repay the effort of designing them. The locks are being again fixed outside instead of inside the framing, and treated ornamentally, instead of destroying the rail tenon; and the lift-up latch, with a bolt only inside the door, is being used for bedrooms.

It is of course not always possible to afford carrying these features to the delightful point of varying each lock fitting, but it is quite legitimate to have a set made from our own design in malleable iron, so long as the moulds are destroyed and the pattern thus confined to one building. The great demand for wrought-iron has, a leading producer assures me, decreased the cost of production by exactly one-half in the last four years.

Nothing could be more beautiful or suitable than plain hammered iron in contact with unpolished oak, stonework, &c., and of course it can be painted to any extent, but something more refined is required where the surrounding surfaces are delicate and highly polished. One can in these cases coat the iron with nickel, platinum, silver, or gold, or polish its surface. Just now some beautiful work is being done by bronzing copper and brass to a deep blackish tone; this material possesses a sort of silvery green tone, and when enriched with silvered or gilded foliage, produces a most satisfactory effect. Polished iron can now be protected from rust for a long time and it is often extremely effective. Gilt iron toned down with stains is most beautiful.

#### GLASGOW ARCHÆOLOGICAL SOCIETY.

THE thirty-second annual general meeting of the Glasgow Archæological Society was held on Thursday in last week. Mr. John Honeyman, president, occupied the chair, and there was a large attendance of members.

Mr. Wm. George Black submitted the annual report of the Council, which referred to the interest which the Society had taken in the scheme for the exhibition of a collection of historical and archæological objects in the Bishop's Castle of the Exhibition, and the success with which the scheme had been carried through; and traced the proceedings of the British Archæological Association when holding its annual Congress in Glasgow. The number of members admitted during the year was twenty-seven, making the present membership eleven honorary and 248 ordinary members.

The report was adopted.

Mr. John Honeyman then delivered the introductory address, in the course of which he said:—The more we examine Glasgow Cathedral the more we must be struck with the fact that, as a field for fresh discovery, it seems to be inexhaustible. I never visit it as a student without finding something new, and never have I been more impressed with its marvellous variety and beauty of design, and the excellence of its structural details, than on the occasion of my last visit. The object of this visit was to search for old work—I mean twelfth-century work—at the west end of the crypt, to make sure that I had not overlooked anything of the sort. I found, as I expected, that the whole of the west wall is of the same age as the rest of the crypt, and we have absolutely nothing to indicate what the previous building was like, except the small transitional fragment at the south-west entrance and the position of the shrine of the patron saint. This subject—the early arrangement, or rather the origin of the peculiar arrangement of the choir and crypt—has been invested with quite a new interest by the very suggestive remarks of the Marquess of Bute at one of the meetings of the Congress. The idea of tracing the origin of arrangements in a thirteenth-century church here to Italian models is apt to be dismissed without much consideration by ecclesiologists. But that will not be so if the very peculiar circumstances of the case are taken into account. Let us glance at the state of matters immediately antecedent to the episcopate of Achaius. First of all we must remember that, at a time when Roman influence was distinctly visible in the early ecclesiastical buildings of England, Rome had positively no influence here. Then in the eleventh and twelfth centuries, when a change occurred in this respect, the architecture of England had developed into a truly national style; the plan and arrangement of church, as well as many details, had become distinctly English. We had then English-Norman and Transitional architecture, differing characteristically even from the architecture of France, with which it was most closely allied. Now, it was this English variety of Romanesque which was introduced into Scotland by Malcolm Canmore and his sainted queen. Wherever their influence was paramount there we find that churches were erected after the English model, and, no doubt, designed by Englishmen, for Margaret's recognised spiritual father and adviser was Bishop Lanfranc, of Canterbury, who aided her in her missionary enterprise, not only by his counsel, but by sending her earnest and trustworthy men, familiar with the customs and arts of the south. Hence, no doubt, the curious and interesting fact that even the chapels of that period which remain are good examples of English-Norman architecture. The arrangement of high altar immediately over the shrine of the patron saint is not uncommon in our early churches—as at Canterbury, Durham, Dunfermline, and elsewhere; but it is traceable directly to Rome at a much earlier period. The original church at Canterbury was no doubt founded on a Roman model, and we have already noticed the connection between Canterbury and Dunfermline. Of the second church—that built by Jocelin—we know almost as little as of the first. It was probably somewhat larger, and I think we may say certainly more substantial and costly. The approach to the crypt would be as at present. The east end would not be much beyond the shrine of St Kentigern, and the high altar would, as before, be over the



tomb. The most marked difference of arrangement in the present church is that the high altar is not immediately above the tomb. Bondington projected his church on so grand a scale that the end of his choir was a long way east from that of the older building, and the position of the high altar was necessarily changed. This subject is capable of further elucidation, and is deserving of it; meantime I would only further remark that if we grant the Italian origin of the general arrangement we are not required to admit that anything else about the building indicates foreign influence till we come down to near the close of the fifteenth century. The square termination of the choir is not French. The details of the crypt and choir are in no respect French; but you will find the identical details at Lincoln, Rievaulx, Furness, York, and English and Scottish works of the same period too numerous to mention—not copied from each other, observe, but executed simultaneously. The shortness of the transept has been referred to as indicating French influence, but, I think, erroneously. The transept is short for the good common-sense reason that owing to the way the floor space is cut up by the stairs to the crypt a longer transept would have been useless, and owing to the form of the ground it would have been costly, and the architect of our cathedral was much too clever a man to do what was at once costly and useless. Besides, it is not only as short as a French transept, but shorter, which should satisfy us of its strong individuality and its purely utilitarian origin. In French cathedrals where the transept does not project beyond the side aisles there are generally four. Again, the arrangement of the east end is quite original, and is a clever device to overcome the difficulties of the site. The space beyond the choir has hitherto been called (erroneously, no doubt) the lady chapel. Mr. Loftus Brock, at our meeting in the cathedral, suggested that it should rather be called the retro-choir. That would certainly be preferable, but still I can hardly think it strictly applicable. A lady chapel may, and sometimes is, with strict propriety termed a retro-choir—it is, in fact, a small choir behind the main choir; but here we have nothing whatever in the shape of a choir. It is not even a chapel, but a cluster of chapels—the outside aisle being divided into chapels as in the crypt below, and the inner aisle forming an ambulatory connecting the north and south side aisles. The termination of the choir is emphasised by the introduction of the centre pier, which may be said to carry the main arcading right round the east end; the only difference indeed between the end and the sides is that at the end there are two aisles instead of one, and the roof of these aisles being kept flat, there is no triforium, and the windows are therefore carried down to the string-course immediately above the main arcading. The arrangement is quite unusual, and fortunately it has come down to us unaltered, owing to the great difficulty of making any extension eastwards. It is rather curious that the doors to the vestry and the chapter-house, in the choir and crypt respectively, were not kept a bay further west, so as not to interfere with the use of the north-east bays as chapels.

I must express my sympathy with Dr. Burns in his desire to see our beautiful cathedral more appropriately arranged and furnished. I am quite sure that any movement with this object in view will have the hearty support of this Society. We are very specially interested here on the subject of the preservation of ancient buildings, because it is impossible to deny that our own cathedral suffers from the present mal-administration. I need hardly say that I do not blame the subordinate officials of the Board of Works. They are helpless in the matter, and the Department itself blames Parliament for not granting enough of funds; but they will never get enough of funds if they don't ask for them, and they will never ask for them unless they have a proper sense of the responsibility they incur when they neglect what is absolutely necessary for the safety of such a building as Glasgow Cathedral. For such a purpose Parliament would not grudge the necessary money. The citizens of Glasgow themselves would gladly provide it if the Government gave up its charge altogether. I do not say that this is desirable; but on principle it is clearly wrong that national burdens should be unequally distributed. The question is not, Do the people of Glasgow think the cathedral worth preserving? but, Do the people of the United Kingdom think it worth preserving? And if the answer to that question be in the affirmative, no plea of poverty will exonerate a Government Department from the consequences of a neglected duty. Here we have good cause to complain of neglect, and for anxiety, but I do not think that any immediate danger is to be apprehended from the defect recently pointed out by Mr. Loftus Brock. The inclination of the north walls of the nave is, in my opinion, a more serious matter, especially as no attempt has been made to construct the aisle roof in such a way as to give the clerestory the most effective support; but there is a still more dangerous settlement at the south-east corner of the choir. The attention of the First Commissioner of Works was called to this several years ago, when the rent which extends irregularly from top to bottom had opened ominously. It was then suggested that the foundation at that point should be examined and secured, and

the bend of the wall restored, and Dr. Cochran-Patrick and Dr. Cameron, who had an interview with the First Commissioner on the subject, were assured that it would receive immediate attention. It is hardly credible that all that was actually done was to plaster up the crack with cement. The most cursory examination by any professional man must have satisfied him that, except for the purposes of stopping a cold blast which found its way freely through the crevice, such treatment was absolutely useless; so that, in face of that fact, it must be held that the authorities deliberately chose to run the risk of the east gable of the cathedral coming down by the run, rather than spend the small sum necessary to insure its safety. The action of the Department in this case, I think, clearly points to the expediency of taking the charge of ancient monuments entirely out of its hands, and transferring it either to a body specially constituted for the purpose, and comprising local representatives, or to such existing bodies as the Board of Manufactures (whose chief fault is in its name), composed of men having local knowledge and a keen patriotic interest in the objects committed to their care. I need hardly say that the settlement at the east end of the cathedral continues. The crack has reopened, and another eighth of an inch at the level of the choir window-sills must now be added to the inclination of the east wall. The total width of the rent in the eastmost bay is  $7\frac{1}{4}$  inches, and this has from time to time been simply plastered up. It does not require an expert to understand how real and serious this danger is, and how greatly it is increased by delay. Every year that passes without the proper remedies being applied makes the task more difficult, and—as movement continues—prolonged neglect must certainly lead to sudden disaster. It is not the only part of the building which is being neglected, but it is the most important, and I allude to it as of itself a sufficient justification for demanding that the charge of such precious monuments shall be transferred to more sympathetic custodians. Before leaving this subject I must just in a word refer to other objectionable features in the present arrangement. It almost seems as if it would require an Act of Parliament to get the absurd placards removed from the building. The Board of Manufactures would make short work of them. Then there is the exclusion of the public two days in the week unless they pay for admission. Why should any British subject pay for admission to a national monument? Lastly, and worst of all, a visitor is not allowed to sketch in the building unless he has written permission from the Board of Works, and that can not be obtained in Glasgow! The necessary permission should in any case be obtainable within a quarter of an hour; but I must express my strong disapproval of the modern fashion of requiring such permits in our ancient buildings. It may be taken for granted, indeed it is morally certain, that those who wish to sketch are not likely to destroy, and the most that should be asked of them is that they should sign their names in a book kept in the building for the purpose.

A vote of thanks was accorded to Mr. Honeyman for his address.

#### THE ARCHÆOLOGY OF THE WALLACE SWORD.

THE sword which used to be in Dumbarton Castle, and which is supposed to have belonged to Sir William Wallace, has been removed to the National Wallace Monument at Stirling. The Rev. Dr. Rogers, of Edinburgh, who was influential in the transference, said:—

This sword is associated with a glorious history, for it was wielded by one who, in an age when principle succumbed to expediency, was pure and without reproach; who never yielded allegiance where it was not strictly due; and who resisted oppression to the death. Consequent on fractures which have been twice welded, the weapon has been reduced from its original length, but it was at first a noble blade, which, in respect of its possessor, was in the poet's words—

Fit for archangel to wield,  
Yet light in his terrible hand.

Borne by the patriot at the battle of Stirling Bridge, it signalled the commencement of a struggle which was not to terminate until the prostrate spirit of the nation had been revived, nor again to droop or decay till on the field of Bannockburn were repelled the hosts of the invader. When foully captured, as he slept at Robroyston, on the night of August 5, 1305, Wallace had this great blade resting by his pillow; and when he was hastened to London to meet his cruel death, it was borne to Dumbarton as the prize of its governor, the recreant Scotsman who had betrayed its possessor. At Dumbarton the sword has for six long centuries remained as a protest against treachery and injustice, and now, at the hands of Colonel Nightingale, as commander at Dumbarton and Stirling, it is to become a trophy in the patriot's monument. As governor of Dumbarton, Sir John Monteith received this sword in August 1305, and two hundred years



thereafter, namely, on December 8, 1505, the accounts of the Lord High Treasurer inform us that, at the command of James IV., the sum of twenty-six shillings, equal to about thirty pounds of our present money, was paid to an armourer for binding a riding sword and a rapier; also for the "binding of Wallace sword with cords of silk," and providing it with "ane new hilt and plomet," also a "new scabbard and new belt." And it will be remarked that while the rapier and the riding sword are named as being simply repaired, the Wallace sword is described as adorned with trappings of silk; also as having been provided with the specified additions of a new hilt and pommel, a new scabbard, and a new belt. Concerning the weapon we learn nothing further for 320 years; but a letter which, in October 1872, I received from the War Office, informs me that in the year 1825 the sword was sent for repair to the Tower, when the Duke of Wellington, as Master-General of the Ordnance, submitted it for examination to Dr. Meyrick. This gentleman, afterwards Sir Samuel Meyrick, was an authority as to ancient swords, but in estimating the age of the Dumbarton weapon he was guided by its mountings only. Judging from these, he concluded that the sword was not older than a sword in the British Museum connected with the Earldom of Chester, and belonging to the reign of Edward IV. That I may not misinterpret his sentiments, I quote from Sir Samuel's work on "Ancient Armour," in which, at vol. ii., p. 177, when referring to the reign of Edward IV., he writes:—"The two-handed sword, shown at Dumbarton Castle as that of Wallace, is of this period, as will be evident to any one who compares it with that of the Earldom of Chester in the British Museum." The Chester sword was afterwards examined by Mr. George Ormerod, of the Society of Antiquaries, who, in the fifth volume of "Vetusta Monumenta," shows that the weapon was the Sword of State which Edward V. had borne before him when, as Prince of Wales, he, in 1475, made a triumphal entry into Chester Castle. If, then, the Chester sword belongs to the year 1475, Sir Samuel Meyrick approximates nearly to the date of the mounting of the Wallace sword, which occurred just thirty years later. But the Wallace sword was, in 1505, an old blade, which required a new hilt and pommel, a new scabbard, and a new belt. And as the weapon was then so materially shattered, it seems reasonable to conclude that it was decidedly ancient; moreover, that before it was allowed to rest in the Dumbarton armoury, it had been subjected to much hard usage. And its being adorned with silk tassels, by the King's command, leaves us in no doubt as to its being held in special veneration; while in the register the weapon is described as "Wallas sword," no qualifying word of doubt being expressed as to its genuineness. And apart from the circumstance that by two separate weldings the blade has been shortened, it is otherwise a duplicate of the two-handed blade of Sir Richard Lundin, used at the battle of Stirling, now preserved at Drummond Castle. I compared the swords in 1861, when they were together under my charge. One blunder leads to another. Consequent upon Sir Samuel Meyrick's judgment pronounced in 1825, the mountings of 1505 were removed, and a common handle of the fifteenth century substituted. This information I obtained in the letter which, in 1872, I received from the War Office. But now that we have got possession of the sword, we shall be careful that the weapon with which the hero was wont to "mak great rowme" about him will be mounted in the fashion in which he nobly grasped it, and we shall retain it as no unimportant addition to the national regalia.

#### HEAVY BUILDINGS.\*

WHAT is a heavy building? It is certainly no new thing. The world is dotted with them so freely that, in abundance of human interests, they rival the works of nature. But architecture changes as time changes. Each age has its character which is recorded in its buildings more permanently than in anything else. The ambitious efforts of the eras of military conquest and the monumental expressions of those of religious enthusiasm are written clearly in the wrought stone of the old edifices which are our inheritance. And these are not undervalued. We still experience the same emotions and passions and express them, more or less ably, in the same materials. We still build towers and cathedrals and tombs, and all these might come in a general way under the title of this paper.

But there is now a new order of things, this is the epoch of industrial enterprises. Let us consider for a little time this newer work we are doing. We are not in the habit of looking far into the past for guidance in the scientific department of our labours however often we may grope there for artistic inspiration. And this is because most of what we do is new. The architects of ancient times have raised thousand of tons of marble in majestic beauty; that was their aim and object in building, and all else subordinated to it. We are called upon

to deal with equal or greater structures with certain additional demands of utility and economy which would have rendered the task impossible to the masters of olden times. The stately buildings of this class which tower over the streets of our modern cities are loaded with tier upon tier of spacious chambers; they are permeated with countless flues and ducts and wires, and made alive with machinery vibrating with enormous power. And with all this, the walls upon which they are upheld must be pierced with innumerable windows and doors, so that the light of day and swarms of busy workers or luxurious residents and their attendants may have free access even to the basements and cellars. These tiers of floors must often support enormous loads of merchandise or of machinery or of human beings, and, lastly, the structural materials must not be only incombustible, but as far as possible fireproof.

Under these conditions we find that our work is, in truth, of a new order of things, and in that new order ideas develop rapidly; the most daring conceptions of one generation become the commonplace thoughts of the next. Accumulated experience reduces to method all those theories which are found worthy of it by the tests of practice, and the quicker we can evolve these methods and formulate their rules the easier our progress and the freer our course to the next stage wherein new problems await us; therefore one of the tendencies brought about by the need for these heavy buildings is toward mutual assistance—a careful observation of what other things are doing.

There is undoubtedly too little attention given to the process which may be called the analysis of contemporary art. In the earnestness of individual work there is too much isolation and independence. The man who discovers says nothing of his thought, and each one of us explores and rediscovers the same truth; and indeed there is a harmful impression that the rule of originality should be interpreted to debar the adoption and repetition even of a good principle, so that what is done in this direction is to some extent disguised and apologised for. It was not thus that the old-time heroes in our craft worked. From the time of the Pyramids down to that of the Renaissance the schools were more evident than the individuals, and, whether by master or by pupil, the work shows subordination to accepted codes. From these undisputed principles individual labours toward perfection commenced at a stage higher than that at which many now terminate.

It was by this collective knowledge the Greeks carried refinement of detail to its height, and (to go from one extreme example to another), it is by the power of the same method, the acceptance and adoption of certain unoriginal but established types, that the designers and builders of the least educated class among us are enabled to erect fairly satisfactory structures of many storeys and complex arrangements, such as the cheaper flat and tenement buildings of New York City. We will not overlook the imperfections of these buildings, nor will we mention them as worthy of imitation, but they do teach the lesson of co-operation and collective experience which enables work to be done by men, not one of whom independently and originally would be competent to do it. The diversified character of buildings of the higher order may lessen the opportunity for this evolution of their design, but it does not preclude it. There is enough of it evident to show the need for more. Much has been said and written of late, especially in Europe, about a modern style of architecture. The nearest approach to it is without doubt shown in modern American business buildings, and if the best specimens by the acknowledged leaders in our art are compared it will be seen that sometimes unconsciously, even unwillingly, they follow more or less perfectly the same methods. Heavy buildings of this class promise to compel by their limitations a uniformity of design which almost amounts to a style. In order to discover the laws of this style, let us examine then practically the circumstances in which they originate. Scientific design proceeds upon past experience by continuing or adopting successful features and avoiding known faults. What then are the successes and the faults in recent heavy buildings? It is understood that fireproof buildings of many storeys are more particularly referred to.

Despite all that has been learned and written upon the subject the great difficulty of unequal settlement is the chief cause of faults. I speak of the settlement by compression of the soil upon which a building stands. It is a curious fact that much of the most valuable and densely covered building land in the world is notoriously bad. Many of the heaviest buildings stand on soft, yielding soil. The lower part of New York with quicksands, silt and mud, Boston with its districts of made ground where tidal water used to ebb and flow, Chicago with its lake shore alluvium and wet sand, all furnish examples of this. Among older sites Pisa whose leaning tower has puzzled so many diletanti into fanciful fiction, and Venice and Antwerp and London may be mentioned, the last including large areas of the blue clay of the Thames basin. The commercial origin of their prosperity accounts for it. Where the ships came the cities grew, and there the architects were set

\* A paper read at the Buffalo Convention of the American Institute of Architects, by Mr. R. W. Gibson.



to work. Sometimes other causes prevail; as, for example, at Albany, where the New York State Capitol stands upon a hill of clay, but this same clay when it lies with its natural stratification unbroken is in the writer's experience found to be a better soil than is generally supposed.

But let us not linger upon subjects already extensively discussed. These compressible soils, it is well known, must be built upon with equalised loads. The law may be accepted as established that each square foot of base of pier and wall must bear with an equal pressure in order to secure an equal settlement. But we may still look around us and see faults which this doctrine was to banish. This subject was chosen because of the discovery by the writer, in a series of examinations of modern buildings, of the fact that unequal settlements abound. And here are some of the reasons. We calculate the loads upon our girders, columns, walls, and piers, and we say, for example, column C in a ten-storey building has a base bearing three tons per superficial foot, and wall W X a base expanded to give the same pressure. Wall W X we will assume to be a side wall in a building not on a corner. The structure is finished and occupied, and the wall W X slowly and irresistibly takes its half-inch, or inch, or more of settlement, squeezing down the soft soil despite all preliminary ramming or other preparation. This we expected, but why are the floor levels disturbed, and why those little cracks in the front lintels and sills if all has settled together? It is somewhat disappointing to look about and see how many sills and lintels betray this fault of unequal settlement by a crack close to one end—just the bearing end broken off. Inside the building the columns in several cases appear to have lifted. It has been argued that the brick and mortar was compressed in its numerous joints, while the iron of necessity is not perceptibly changed. This is true, but not to the extent now in question. Let us look at our calculations again. The wall is all right—so many feet, so many tons; the columns, so many feet of iron, so many feet of floor, weighing perhaps 70 pounds per foot, so many feet of floor loads at 150 pounds per foot—here we have the error. We may say it is not an error, but anything is an error which produces bad results unexpectedly. The floor loads are not there. The masonwork is on the wall base in actual fact, but the load of 150 pounds per foot is on the floors only in theory, and the column foundation which we assume to support, say 300 tons, has actually only 180 tons. What wonder that there is trouble! And in the front, where the girder ends rest upon the front pier, as they usually should do, the same thing occurs in a lesser degree. There is a larger proportion of masonwork in the calculated load, and only one girder instead of two, but the difference here even amounts perhaps to 100 tons. What can be done? Custom based upon knowledge requires that each floor shall be equal to a safe load of 150 lbs. per foot. In New York City the law requires this for a fireproof office building, and further, that the columns shall be safely equal to the total of all the floors upon them at the same rate. This would seem to be unnecessary in many cases. In each floor an excessive strength is demanded to guard against contingencies, such as the movement of heavy safes or the possible use of some floors for storage, but on all the floors together a fair average is permissible, because the average is always naturally maintained by reason of the number and variety of the different storeys. The columns we may, however, accept in compliance with the law and customs; the excess is not harmful, but in the foundations we have seen that it is positively injurious. The laws, recognising the impossibility of the task, usually leave the arrangement of this part to be done according to circumstances, except that they stipulate a minimum, applicable to good soil, which does not approach the necessities of the cases under consideration.

The foundations of columns should be equalised with those of walls upon a basis of a liberal but not excessive average of floor loads, say 50 lbs. or 60 lbs. per foot besides the weight of the floor material. This could not possibly be surpassed in an office or apartment building; it is the weight of a crowded-seated audience on every floor at once; it is an allowance of ten or twelve tons of load in an office or apartment 22 feet by 18 feet; if some floors could possibly be loaded more heavily others would certainly carry less. Let us work according to these facts, and while we may still expect a few cracked ends of lintels the difficulty will assuredly be lessened. It is, therefore, evident that while excessive strength is a harmless precaution in the actual structure, yet a true calculation is necessary for foundation areas.

Next, let us give some further attention to the front. There is a natural set of dimensions, arising from limitations and requirements, in these buildings which leads us all for some time in similar paths. The storeys (excepting the first) are usually required about 11 or 12 feet high, the girders 15 or 16 feet apart, in order to use convenient spans of beams and floor arches, and the limits of the bearing of girders will be naturally 20 to 24 feet. If the building is so wide as to demand columns,

because first, the side walls and foundations, with few or no openings, are in themselves extremely heavy, while the front and rear walls with numerous windows are lighter; and secondly, because the homogeneous side wall is more adapted to receive the distributed floor beams, while the front and rear walls, already divided into piers and openings, are better fitted for fewer concentrated weights. The windows will be required about 4 or 5 feet wide, with piers of 3 or 4 feet between, or perhaps the openings rather less and the piers or walls more according to the purpose of the building. This agrees very well with our spacing of girders, except that two windows come to each division, and here we have the motive for the design of three-fourths of our modern heavy buildings. The two windows are combined, and the pier carrying the girder increased, while the other is lessened. The heavy construction of course compels openings to be placed in perpendicular lines, except in the uppermost storeys. So far so good; but now arises another difficulty which has been abundantly studied. The intermediate pier is often carried up from the same foundation (usually continuous under such a front) which carries the main piers. These latter with their enormous loads, perhaps 400 tons each, compress the soil as calculated, but the foundation laid continuous does not remain so. The part loaded goes down, the part under the windows remains where it was placed, and the intermediate columns, whose comparatively little weight rests upon it, do as it does. All the way up the front is slightly distorted, and lintels are cracked. When the writer first began these observations, the cracks in the lintels were rather puzzling. There seemed to be in many cases no apparent cause. The fact is it takes very little unevenness to produce a crack. The force is irresistible, and the lintel is a small stone. A good precaution is to give it only so much bearing as is necessary, so that there is less of the end held in the vice-like grip. With stone resting on stones 3 inches is enough, and many bands, sills, lintels, &c., have 8 or 9 inches running into the pier. If the building is thus more flexible, it will not show these movements at such a trifling stage. But let us go to the root of the evil. Shall we hold down that lighter portion of the continuous foundation and compel it to go all together? And if so, how? The inverted arch is the first thing likely to be called for. It is a doubtful aid for this purpose. If used it should be of ample rise, or rather drop, and a pointed or Gothic form would be best. In a wall with a good depth of masonry below it the arch is no doubt good. It does not take the whole load of its span, but down actually at the bottom next to the concrete an inverted arch must be loaded with about 2½ tons to the superficial foot of base. Think of this enormous load. Turn the arch the other way up and think of it. It is perhaps 6 feet wide, the base is perhaps 10 feet; that makes it loaded with 24 tons per foot of length if considered as a bridge. The thrust is enormous. Imagine the girder necessary to do this work. If it does not do this work it will not compress the soil, as it would demand of it. Suppose we lessened the load by reducing the width; practically this almost amounts to giving up the continuity of the base course. This will be sometimes a gain, especially if the piers are far apart. Or the great piers may have side footings which meet at the foot of the small ones, one the base course, those on the other faces being proportionately less. Then if the great piers are equalised the small ones will be carried down with them; but a flat inverted arch will do no more good than the slab of concrete or the base course of granite. Brickwork and concrete must be considered as possessing no transverse or beam strength under these loads. They will resist pressure, and will spread it, at an angle of about twenty-five degrees from the perpendicular, no more, and the batter of the offsets, or the chord of each half invert, should be at about this angle. There are granite bases to be seen whose offset equals their height, in which an apparent tilt upwards has resulted from the failure of the masonry to carry the pressure out at so great an angle.

But the true way to make our light intermediate piers go down with the heavy ones is to build them upon girders or arches resting upon the latter. Then, even if the great piers differ in settlement, the smaller will maintain their proper intermediate position. It has been assumed that a front entirely of masonry was in question. This undoubtedly is a higher grade of architecture than that in which iron is freely used. Sometimes we see the main piers of masonry carried up with the intermediate piers and other parts entirely of iron, each floor carrying its own tier. This is good in the main, but it misses many of the best opportunities for design, and is of necessity monotonous. Sometimes the iron features are grouped two or three storeys together under arches of masonry; this is better, the stone construction is more complete, and the iron subordinated to it. And other things being equal, the use of masonry throughout will undoubtedly produce the greatest dignity of effect. Now we have reached the point in the argument where æsthetic ideas are invited to take their place. Here are encountered the facts upon which it is submitted the modern style is founded. Yet the constructive and the artistic are, as they should be, so closely linked that we must not attempt to con-



sider them apart. We have traced the development of the achievement of an equal foundation, now for the superstructure. The superintendent of the New York Building Department once said (if the veracity of a New York reporter may be trusted), "that the commonest error in construction was that of making column and piers too big above and too small below." He referred no doubt to the class of designers before alluded to, whose skill is perceptible only when collected into a sort of joint stock of that commodity. But the same charge in a lesser degree could be made against some buildings of the first class. An intermediate column or pier supports the lintels and the sills of the next storey above, and then comes another similar column, and so on to the top. This is all very well for two or three storeys, because the smallest desirable column will be competent to that extent, and because the uniform size of windows suggests equal columns, but if six or eight tiers are so raised it becomes questionable and monotonous. The single girder, too, has to be made very strong to avoid perceptible deflection, as it is loaded in the centre. To meet this objection another improvement is developed. The two or three storeys for which the superimposed columns are proper are so designed, and then a new girder is introduced with, perhaps for variety's sake, one storey entirely open immediately under it, and the intermediate columns again above. In this we get the numerous tiers of floors and windows reduced to groups. Now, we all know how certain critics of the last generation have protested against the grouping of storeys, as in the Palladian style, condemning it as untruthful and unconstructive; yet there has been an instinctive reluctance to abandon it, and we may be assured that any persistent instinctive feeling of this kind is based upon some reason, although that reason may not be readily discoverable. In our modern construction, carried to a high degree in the differentiation of parts, we find these reasons which were not evident in lesser works.

Another piece of construction, called "false" by some critics, is reached here, too. That is, the use of an arch or stone lintel at certain levels, with a girder behind it or over it, which, it is said, does all the work. It is true the girder does the work of sustaining the load and as a tension member to tie the piers supporting it. But the arch has its duty also. It is a most effective means of holding the piers apart, resisting any tendency which they may have developed to close inward, and, as it carries no weight but its own, its thrust is abundantly met by the ties and the mass of the piers, and an equilibrium of great strength is maintained. And for this same stiffening effect, as well as for æsthetic reasons, a storey may be introduced in one or more places which deals with the front as a whole, not as piers and lintels, but as a wall of the full thickness, with openings through it. Pleasing contrasts may be obtained by dividing certain sections into three windows instead of two, and this without any imperfections in structure. The sky-line is sometimes broken by gables or dormers, and sometimes as severely horizontal as a Roman might have designed. Either method is permissible, and the authors of this style are not afraid to use the simpler motive when circumstances require. Then the lack of light where it is most needed—namely, on the ground storey—often prompts the placing of the first main arch or lintel over this or even over the second floor, instead of at the foundation. Lastly, the monotony of the equal storeys is varied by collecting them in unequal groups. Thus we arrive at the fully developed phase of a most simple and dignified composition for the front of a modern heavy building of the commercial class, which is, to sum up, a façade of many storeys divided horizontally into a few main groups. These are contrasted in proportions by including one, two or three floors. The vertical elements are widely-spaced continuous main piers, forming openings subdivided by small piers discontinuously in the different groups.

This analysis of some of the motives of modern design, and the construction from which it arises, reveals the close relationship of all the best work of this class, however varied in treatment of detail. Its truths are alike expressed in the Romanesque work, which is so fast growing in favour throughout the country, in the scholarly Renaissance of New York, and in the more free arches of Chicago. The principles are the same, and the necessities and the solutions of the problem, by different heads and hands, have that in common which constitutes a new school of architecture, and which, with the prevalent strong and able treatment of the noble round arch, promises to establish a national style. Already it is begun, and we have a right to expect more of the future than we have received in the present.

**New Premises** have been erected for the Express Dairy Company at Hampstead, the ventilation of which is carried out on the Boyle system, the latest improved form of the patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

## THE WASHINGTON MONUMENT.

THE November number of *Stone* (Indianapolis) says great care is taken to note the movements of the Washington monument, for it does move. The law of contraction and expansion of material by heat and cold operates here as elsewhere. When the sun shines full on the eastern face in the morning, the stones on that side expand and throw the shaft slightly to the west. Then the sun goes around to the south, and the apex of the monument makes a corresponding swing to the north. As the orb creeps about the sky to its final setting in the evening, the glittering point on the top of the monument makes a contra-movement around half a circle, gradually settling back to its normal position after the rays of the sun have lost their power. This movement has never been calculated, but is undoubtedly very slight. The wind, too, has an effect upon the structure. From the centre of gravity of the shaft, located 174 feet and 10 inches from the floor, is a cross-beam from which is suspended a fine steel wire, protected by a galvanised iron tube about 4 inches in diameter. This hangs to the floor at the north-west corner of the elevator well. At the bottom is a plumb-bob weighing 25 lbs., suspended by means of the wire, and hanging in water. An iron cylinder protects the instrument from injury, and a little iron house 4 feet high keeps off the draught. Through the cylinder is a telescopic eye-piece, in one end of which are two vertical wires about one-quarter of an inch apart. When a candle is held at an opening in the side of the box and the eye is applied to the outside end of the tube, the plumb-line can be seen—a fine line between the vertical marks. Any movement in the shaft is recorded by a corresponding movement in the line. When the structure is at rest and in its normal position, the line hangs still midway between the others; but when the shaft is disturbed by the action of the wind it sways back and forth like the pendulum of a clock, always coming to rest in the centre. This is observed every day, and if the custodian should ever notice the line hanging still at any point outside of the two cross lines he will then know that the monument has been permanently moved from its level position. Until then, however, no one need be alarmed by the oscillations of the shaft from the action of the wind or the influence of the sun.

## CHURCH BUILDING AND RESTORATION.

**Granby.**—The parish church, All Saints, has been reopened after restoration. The architect is Mr. Edward Turner, Bloomsbury Square, London. The contract for the work was let to Mr. H. Green, Waterway Street, Nottingham. The woodwork has been supplied by Mr. H. Scott, Sherwood Street, Nottingham; the lamps and the lamp frames by Mr. F. Coldron, Brant Broughton; and the windows by Mr. H. Holmes, Arkwright Street, Nottingham.

**Langley.**—The committee of the Langley New Town Mission Church, Bucks, having instructed their architect, Mr. Albert E. Pridmore, of 2 Broad Street Buildings, to prepare the necessary plans, &c., that gentleman has forwarded two separate schemes, which will be discussed and the course to be adopted decided at the next meeting.

## GENERAL.

**M. Auguste Cain** has been commissioned to execute a group in bronze, *Combat of Lions*, for one of the public places of Copenhagen.

**Mr. H. T. Ashby** read a paper on Thursday before the Institute of Builders upon "Quantities."

**Mr. H. A. Jones, F.S.I.**, has opened offices at 11 Wellington Street, Strand, as a surveyor, valuer, and house and estate agent.

**Sir J. A. Picton** will read a paper on "The Successive Town Halls of Liverpool" at the meeting of the Liverpool Architectural Society on Monday.

**The Bishop of Salford** has purchased Moston House, Harpurhey, for an establishment for a religious sisterhood.

**Plans are being considered** for the immediate erection of a church at Lostock, in compliance with the unanimous desire of the population of Lostock Junction and Lostock Park.

**A Church House** is to be founded in Liverpool for the various diocesan organisations.

**A Town Hall** is proposed to be built at Aberfeldy, and a committee has been appointed to obtain subscriptions.

**Extensive alterations** and improvements are being carried out at Himley Hall, Staffordshire, where Lady Dudley intends to take up her residence early in January.

**The Liverpool Improvement Committee** have agreed to pay 90% per square yard for land to be taken for the widening of Church Street.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, NOVEMBER 23, 1888.

## COMPETITION OPEN.

CHERITON.—Nov. 29.—Premium of 50*l.* is offered by the Guardians of Elham Union for the best method of Sewage and Rainwater Disposal. Mr. R. Lonergan, Saltwood, Hythe, Kent.

## CONTRACTS OPEN.

BLACKHILL.—Nov. 24.—For Building Small Farmhouse, &c. Rev. J. J. Cundhill, Muggleswick Vicarage, Blackhill, Durham.

CHILBOLTON.—Dec. 1.—For Building House. Mr. John Hillary, Architect, Longparish, Hants.

CLECKHEATON.—Nov. 26.—For Erection of Public Baths. Mr. R. Castle, Cleckheaton, and Mr. W. H. Howarth, Cleckheaton, Joint Architects.

DOVER.—Nov. 24.—For Building Premises, Cannon Street, for Messrs. Wright Bros. Messrs. Cresswell & Newman, Architects, 54 Castle Street, Dover.

DOVER.—Nov. 27.—For Construction of Store and Shed, at Stembrook. Mr. E. Wollaston Klocker, Town Clerk, Castle Hill House, Dover.

EARLSHEATON.—Dec. 10.—For Building Power Loom Sheds, Engine and Boiler-houses, and Long Chimney. Mr. F. W. Ridgway, Architect, Church Street, Dewsbury.

EAST DONYLAND.—For Building Four Almshouses for Lady Alfred Paget. Mr. F. Evelyn Morris, Architect, West Stockwell Street, Colchester.

HAMPTON-ON-THAMES.—For Building Two Pairs of Semi-detached Villas. Mr. Frank Roberts, Surveyor, 110 Cannon Street, E.C.

HASTINGS.—Nov. 30.—For Building Mixed School and Offices at Ore. Mr. F. H. Humphreys, Architect, 6 Trinity Street, Hastings.

KNUTSFORD.—For Building Manse. Mr. J. H. Burton, Architect, Warrington Street, Ashton-under-Lyne.

LANDPORT.—Dec. 4.—For Erection of Stands, &c., in Drill Hall, for the Annual Tournament. Mr. A. H. Bone, Architect, Hanover Street, Portsea.

LEIGH.—Nov. 31.—For Alterations to the Town Hall, for the Leigh Local Board. Mr. J. C. Prestwich, Architect, Leigh.

LEIGH.—Nov. 31.—For Painting, Paperhanging, Decorating at the Town Hall, for the Leigh Local Board. Mr. J. C. Prestwich, Architect, Leigh.

LONDON.—For Building Food Dépôt, Edgware Road. Mr. J. Williams Durnford, Architect, 101 Queen Victoria Street, E.C.

NELSON.—Nov. 26.—For Building Pair of Semi-Detached Villas. Mr. H. Whitaker, Architect, Nelson.

PITSLIGO.—Nov. 26.—For Building Parish Church. Messrs. Matthews & Mackenzie, Architects, 255 Union Street, Aberdeen.

PONTYPRIDD.—Dec. 5.—For Building Arcade, with Shops, Cellars, &c. Messrs. Taylor & Evans, Architects, Cardiff.

SLOUGH.—Dec. 13.—For Building the Leopold Institute. Mr. H. A. Cheers, Architect, Twickenham.

WEYMOUTH.—Nov. 26.—For Alterations and Additions to Workhouse and Premises. Mr. R. C. Bennett, Architect, 10 Gloucester Terrace, Weymouth.

WINCHMORE HILL.—Nov. 23.—For Two Additional Pavilions and Additions, &c., to Administrative Block, Northern Hospital. Messrs. Pennington & Bridgen, Architects, 8 John Street, Adelphi, W.C.

## TENDERS.

### BIRMINGHAM.

For Laying Pipe Sewers (4½ miles), Yardley, Olton and Dorridge, and Laying-out Lands for Irrigation purposes, for the Solihull Rural Sanitary Authority. Mr. F. SMYTHE, Surveyor.

Jones & Fitzmaurice, Birmingham . . . . .	£7,681	0	0
Jevons & Son, Dudley . . . . .	7,214	0	0
Curral & Lewis, Birmingham . . . . .	7,010	0	0
J. Biggs, Birmingham . . . . .	5,870	0	0
LAW, Kidderminster (accepted) . . . . .	5,665	0	0

### BIRKENHEAD.

For Patent Hot-water Heating Apparatus for Hall and Conservatory at Roseneath, Prenton Road West, for Mr. Charles Sandell.

RENTON GIBBS, Liverpool and Birmingham (accepted).

### BRIGHTON.

For Terrace Walk, Madeira Road (1,300 feet in length), Enclosed Shelter Hall, with Rooms and Lavatories attached, Hydraulic Lift, and Works in connection, Brighton. Mr. PHILIP C. LOCKWOOD, Borough Surveyor, Town Hall, Brighton.

G. G. Garbutt, Brighton . . . . .	£21,538	0	0
W. J. Botterill, London . . . . .	17,998	0	0
J. G. B. Marshall, Brighton . . . . .	17,990	0	0
W. Hill & Co., London . . . . .	17,100	0	0
J. T. Chappell, London . . . . .	16,444	0	0
W. H. Sawle, Worthing . . . . .	16,355	0	0
A. Kellett, Ealing . . . . .	15,770	0	0
W. W. Smith, Worthing . . . . .	15,530	0	0
A. Dean, Brighton . . . . .	15,500	0	0
Kirk & Randall, Woolwich . . . . .	15,310	0	0
J. Harrison & Son, Brighton . . . . .	15,250	0	0
G. Cheesman & Co., Brighton . . . . .	15,081	0	0
C. G. Reed & Son, Brighton . . . . .	15,050	0	0
G. E. Wallis & Sons, Maidstone . . . . .	14,637	0	0
No name . . . . .	14,514	0	0
Perry & Co., Bow . . . . .	13,990	0	0
J. LONGLEY & Co., Crawley (accepted) . . . . .	13,975	0	0
A. M. Deacon & Co., Lower Norwood . . . . .	13,400	0	0

### BECKENHAM.

For Corrugated Iron Roof, to form Cart Sheds in Seven Bays, 113 feet 6 inches long, with Span 20 feet, including Seven Cast-iron Columns 10 feet high, for the Beckenham Local Board. Mr. G. B. CARLTON, C.E., Surveyor.

A. & J. Maine & Co., London . . . . .	£307	10	0
F. Morton & Co., Liverpool . . . . .	257	10	6
Harbrow, Bermondsey . . . . .	251	15	0
Wenham & Walters, Croydon . . . . .	249	0	0
Croggan, Upper Thames Street . . . . .	242	15	0
South Stafford Iron Bridge Co. . . . .	240	10	0
T. Woodall, Dudley . . . . .	234	11	0
Hammond & Hussy, Croydon . . . . .	220	10	0
Dyne, Steel & Co., Newport . . . . .	219	0	0
Ward & Co., Tipton . . . . .	217	17	5
Clark, Bunnet & Co., London . . . . .	212	16	6
J. Stokes & Co., Bromley-by-Bow . . . . .	210	0	0
Cunningham & Co., Cannon Street . . . . .	210	0	0
Wilmot, Bristol . . . . .	209	17	6
W. Buttell, Worcester . . . . .	209	17	6
The Redcliffe Iron Co., Bristol . . . . .	209	0	0
Glover & Son, Warwick . . . . .	196	10	0
A. Williams & Co., Bankside . . . . .	187	0	0
Blakeley & Co., Liverpool . . . . .	187	0	0
Whitford & Co., Millwall . . . . .	185	0	0
Davies & Co., Upper Thames Street . . . . .	176	0	0
J. LYSAGHT & Co., London (accepted) . . . . .	174	0	0



## BECKENHAM—continued.

For Street Improvement Works, Southill Park Estate, Beckenham.			
Holme & King . . . . .	£12,304	0	0
J. Dickson . . . . .	12,035	0	0
A. Kellett . . . . .	11,804	0	0
G. Bell . . . . .	11,606	0	0
A. Marshall . . . . .	11,165	0	0
Nowell & Robson . . . . .	10,710	0	0
Woodhams & Fry . . . . .	10,628	0	0
Lansbury, Bromley . . . . .	9,932	0	0
R. Mayo . . . . .	9,256	0	0
Mid-Kent Contracting Co. . . . .	9,194	0	0
Farness & Wood . . . . .	8,991	0	0
J. Mowlem & Co. . . . .	8,971	0	0
A. Palmer . . . . .	8,213	0	0
Surveyor's estimate . . . . .	9,145	0	0

## CARDIFF.

For Erection of Banking Premises, and other Buildings, for the Bank Buildings Office Company, Limited, Cardiff. Messrs. JACOBS & PICKWELL, Architects, Cardiff. Quantities by the Architects.

Jones Bros., Cardiff . . . . .	£9,467	0	0
D. J. Davis, Cardiff . . . . .	9,100	0	0
C. C. Dunn, Cardiff . . . . .	8,998	0	0
Shepton & Sons, Cardiff . . . . .	8,885	0	0
Stephens & Bastow, Bristol . . . . .	8,749	0	0
J. Allen, Cardiff . . . . .	8,300	0	0
Sheppard & Son, Cardiff . . . . .	8,294	0	0
C. Burton, Cardiff . . . . .	8,184	0	0
T. Evans, Cardiff . . . . .	7,989	0	0
W. Symonds, Cardiff . . . . .	7,980	0	0
Exors. W. Gradwell, Barrow-in-Furness . . . . .	7,900	0	0
E. Turner & Son, Cardiff . . . . .	7,888	0	0

## Amended Tenders.

W. Symonds . . . . .	6,900	0	0
Exors. W. Gradwell . . . . .	6,800	0	0
E. Turner & Sons . . . . .	6,754	0	0
C. BURTON (accepted) . . . . .	6,671	7	10

## CHORLEY.

For New Front to Shop, No. 87 Market Street, Chorley, for Mr. Alderman Mangnall. Mr. WILLIAM S. VARLEY, F.R.I.B.A., Architect, 12 High Street, Chorley, and 15 Richmond Terrace, Blackburn.  
R. BROWNLEY, Chorley (accepted).

## DOVER.

For Alterations and Additions to the Mortuary, Dover.

Johnson & Co., Dover . . . . .	£110	0	0
J. Hodges, Dover . . . . .	95	10	0
Gee & Fittal, Dover . . . . .	90	0	0
H. Stiff, Dover . . . . .	85	0	0
W. BROMLEY, Dover (accepted) . . . . .	81	0	0

## DARTFORD.

For Laying Gas Mains and Supplying and Fixing Road-lamps in the Roads of the New Blocks of the Asylum for Imbeciles, Darenth, near Dartford, Kent, for the Metropolitan Asylum Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities not supplied.

Coxall & Co. . . . .	£495	0	0
Sugg & Co. . . . .	418	17	6
Potter & Son . . . . .	409	10	0
R. Crane . . . . .	398	0	0
Christie & Co. . . . .	393	15	0
Summerscales & Son . . . . .	390	0	0
T. Torode . . . . .	390	0	0
Williams & Co. . . . .	378	10	0
F. Bird & Co. . . . .	365	0	0
Hayward Bros. & Eckstein . . . . .	356	0	0
BENHAM & SON, London (accepted) . . . . .	351	0	0

## LIVERPOOL.

For Hot-water Warming Apparatus at 73 Bold Street, for Mr. R. L. B. Rathbone. Mr. W. E. WILLINK, Architect, Lord Street, Liverpool.

RENTON GIBBS, Liverpool and Birmingham (accepted).

For Supplying and Fixing Patent Hot-water Heating and Ventilating Apparatus at Laboratory for County Analyst. RENTON GIBBS, Liverpool and Birmingham (accepted).

For Supplying and Fixing Patent Hot-water Apparatus for Heating and Ventilating the Stock Exchange. RENTON GIBBS, Liverpool and Birmingham (accepted).

## LONDON.

For Building extra Storey and various other Alterations and Additions to No. 20 Chester Terrace, Regent's Park. Mr. F. M. ELGOOD, Architect, 98 Wimpole Street, W. CLARKE & MANNOCH (accepted) . . . . . £850 0 0

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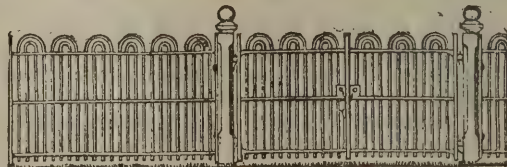
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LONDON—continued.

For Painting and Decorating Work, &c., at West Lodge, Barnsbury Square, for Mr. E. H. Bayldon. Mr. ALBERT E. PRIDMORE, Architect, 2 Broad Street Buildings, E.C.  
J. CRANE (accepted) . . . . . £132 8 0

For New Bank Premises at Clapham Junction, for the London and South-Western Bank, Limited, exclusive of Fittings. Messrs. TOLLEY & SON, Architects, 66 Cannon Street. Quantities by Messrs. Parr & Sons, New Broad Street House.

G. E. Bryan . . . . . £6,731 0 0  
Gould & Brand . . . . . 6,427 0 0  
J. & C. Bowyer . . . . . 6,342 0 0  
W. Shepherd . . . . . 6,200 0 0  
W. Johnson . . . . . 6,100 0 0  
J. F. Chappell . . . . . 6,049 0 0  
C. KYNOCH & CO. (accepted) . . . . . 5,875 0 0

For Clean Linen Room at Laundry, Covered Ways, and Sanitary Turret at the Workhouse, Bethnal Green. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C. Quantities supplied.

Jackson & Todd . . . . . £1,579 0 0  
E. Lake . . . . . 1,398 0 0  
H. Adams . . . . . 1,383 0 0  
Staines & Son . . . . . 1,346 0 0  
W. Johnson . . . . . 1,290 0 0  
J. Holland . . . . . 1,278 0 0  
Barrett & Power . . . . . 1,276 0 0  
C. J. Sherwood . . . . . 1,248 0 0  
R. Edwards, jun. . . . . 1,193 0 0  
Aplin & Redgrove . . . . . 1,191 0 0  
G. Lusk . . . . . 1,116 0 0  
R. Cox . . . . . 1,084 0 0  
J. EDMUNDS, Poplar (accepted) . . . . . 997 10 0

For Works to Premises, No. 21 Budge Row, E.C., for Messrs. J. Wrigley & Son, Limited. Mr. ALBERT E. PRIDMORE, Architect, 2 Broad Street Buildings, E.C.  
T. TAYLOR (accepted) . . . . . £106 0 0

LONDON—continued.

For Erection of New Board Room, Offices, Dispensary, &c., in the Fulham Palace Road, for the Guardians of the Poor of the Fulham Union. Messrs. H. SAXON SNELL & SON, Architects, London.

Oldrey & Co., Westbourne Park . . . . . £19,127 0 0  
Mowlem & Co., Millbank . . . . . 19,057 0 0  
Ward, Clarke & Co., Pomeroy Street . . . . . 18,888 0 0  
T. Bendon, Hammersmith . . . . . 18,830 0 0  
J. H. Mollett, Ludgate Circus . . . . . 18,811 0 0  
Hugh Knight, Morden, Surrey . . . . . 18,630 0 0  
Wall Bros., Carlton Road . . . . . 18,625 0 0  
J. T. Chappell, Pimlico . . . . . 18,617 0 0  
Leslie & Co., Kensington . . . . . 18,579 0 0  
W. J. Adcock, Ladywell, Dover . . . . . 18,479 0 0  
Longley & Co., Crawley, Sussex . . . . . 17,484 0 0  
Ashfold & Co., West Kensington . . . . . 17,432 0 0  
Flew & Co., West Kensington . . . . . 17,350 0 0  
THOS. NYE, Ealing (accepted) . . . . . 17,100 0 0  
A. Brickell, West Kensington . . . . . 16,990 0 0  
Rose & Co., Fulham . . . . . 16,315 0 0

LUDDENDEN.

For Extension of Machine Rooms, Luddenden. Mr. PATCHETT, Architect, Halifax.

Accepted Tenders.

R. Gaukroger, Warley, mason.  
Wood Brothers, Sowerby Bridge, ironfounder.  
E. Marsland, Booth, carpenter and joiner.  
L. Crabtree, Luddenden, plumber and glazier.  
T. Alderson, Luddenden, slater and plasterer.

MANCHESTER.

For Heating, for the M. and L. District Banking Company Limited, their Branch Bank at Ordsall Lane, on the High Pressure System (Hot-Water). Messrs. BARKER & ELLIS Architects, Manchester.  
RENTON GIBBS, Liverpool & Birmingham (accepted).

ORPINGTON.

For Erection of New Stables and for Various Works, Orpington, Kent. Mr. ST. PIERRE HARRIS, A.R.I.B.A., Architect and Surveyor, Basinghall Street, E.C.

G. Johnson (too late) . . . . . £506 0 0  
W. Owen . . . . . 437 0 0  
Somerford & Son . . . . . 387 0 0  
\*KNIGHT . . . . . 369 0 0

\* Accepted subject to modification.

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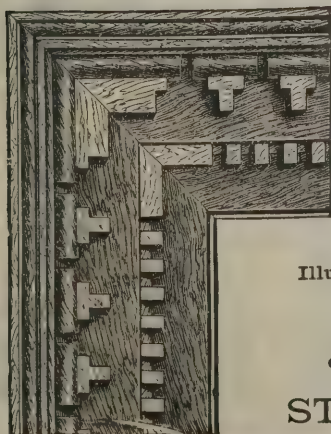


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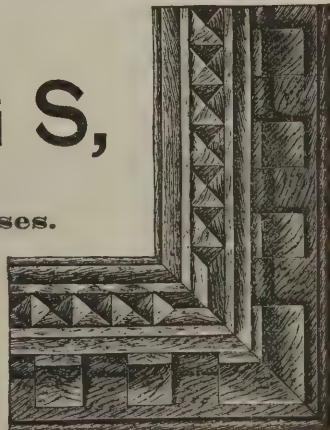
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## RAMSEY.

For Construction of Sewage Outfall Works, &c., Ramsey, Isle of Man. Mr. J. MANSENGH, Engineer, 3 Westminster Chambers, Victoria Street.

L. Bottoms, Wandsworth . . . . .	£9,471	2	6
J. Bush & Co., Preston . . . . .	8,912	11	0
G. B. Godfrey, London . . . . .	7,722	8	6
Fawkes Bros., Southport . . . . .	7,207	17	11
G. Griffiths, Criccieth . . . . .	7,197	7	8
J. & E. Bentley, Leicester . . . . .	7,037	5	2
J. Nuttall, Manchester . . . . .	6,971	9	6
R. Nicholson, Haverfordwest . . . . .	6,300	8	11
R. Malabar, Port Erin . . . . .	6,283	1	11
R. C. Brebner, Edinburgh . . . . .	6,216	17	9
T. Small & Sons, Birmingham . . . . .	5,796	6	9
F. McCulloch, Manchester . . . . .	5,385	18	5
W. & T. Adams, Callander . . . . .	5,113	1	0
Holme & King, Liverpool . . . . .	5,012	19	1
OSBORNE & STEVENSON, Ayr (accepted) . . . . .	4,713	19	3

## WALSALL.

For Two Villas for Mr. Joseph Clare, Walsall. Mr. PETER ADSHEAD, Architect, Walsall. Quantities by Architect.

Thomas Taylor . . . . .	£1,358	0	0
A. Lynex . . . . .	1,350	0	0
William Wistance . . . . .	1,319	0	0
William Kendrick . . . . .	1,266	0	0
E. A. LEWIS (accepted) . . . . .	1,015	15	0

## YSTRADYFODWG.

For Supply of Limestone Macadam, for the Ystradyfodwg Local Board. Mr. J. W. JONES, Surveyor, Pentre, Rhondda.

3,000 Tons.			
J. Griffiths, Treolaw . . . . .	£1,532	5	5
J. Green, Ferndale . . . . .	1,444	9	11
T. Rees, Merthyr Vale . . . . .	1,396	10	11
J. Pruce, Marden . . . . .	1,453	17	4
T. Davies, Tonypandy . . . . .	1,364	3	1
W. Mathias, Treorky . . . . .	1,317	8	5
2,890 Tons.			
T. Taylor, Pontypridd . . . . .	1,035	11	8
The Machen Limestone Co., Newport . . . . .	975	7	6
C. Jenkins & Son, Porth . . . . .	969	7	1
J. Davies, Treorky . . . . .	955	6	8
W. PARRY, Pentre (accepted) . . . . .	934	10	6

## TRADE NOTES.

THE iron miners employed by the Barrow Steel Company in the furnace mines have decided to accept the masters' terms, the advances ranging from about 1d. to 6d. per day. The dispute affected over 2,000 men.

THE Boys' Roman Catholic School, Dockhead, London, S.E., is warmed and ventilated by means of Shorland's patent Manchester stoves, supplied by Mr. E. H. Shorland, of Manchester and London, Mr. Leonard Stokes being the architect.

IN connection with the re-opening of Moniash Church, Derbyshire, a handsome brass eagle lectern has been presented by Mr. George Greaves, of Sheffield. The eagle, which is of massive proportions, stands upon a ball supported by a richly ornamented shaft and capital, with a solid base and three large lions at the foot. The work has been carried out by Messrs. Hardman, Powell, & Co., of Birmingham.

MESSRS. JONES & ATTWOOD, of Stourbridge, have just completed the heating of the Baptist Church, Moseley, near Birmingham, and the Primitive Methodist Chapel at Quinton, near Birmingham.

THE City Commissioners of Sewers on Tuesday decided to issue notices for the acquisition of all interests outstanding, so that the improvement of Fetter Lane may be completed without delay, and the land belonging to the Commission, which has been vacant for a year or two, built upon.

WE notice that Messrs. Kelley & Co.'s address is changed to 23 Castle Street, City Road, E.C., their address having been previously 24 Castle Street.

MR. JOHN GRUNDY, of London and Tyldesley, is engaged in heating Sherborne Abbey for the architects, Messrs. Carpenter & Ingelow, and on Thursday last week the workmen at the Abbey, in excavating along the main aisle, came across a heavy lead coffin resting in its vault, which, unless removed, would have been in close proximity to the heating apparatus. It was found to contain the body of a young lady, apparently about twenty years of age, and evidently a person of high social rank, the features being those of an exceedingly good-looking person, and found to be perfect. The coffin lay in a brick vault at the west end of the main aisle, and had been buried in the orthodox fashion with the feet towards the east. There was no plate, and the probability is either that it had been stolen during the early history of the church or had somehow disappeared. The outer oak encasing the lead had

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entirely rotted away. The opinion is that it must have lain there for seven or eight hundred years at the least.

MESSRS. CLARK, BUNNETT, & Co. (Limited), engineers, in reference to the recalcitrant iron curtain at the Shaftesbury Theatre, write: "We, as the manufacturers of that curtain, desire to explain that there was no defect whatever in our machinery, but that, owing to the want of proper oiling and attention, the valve of the curtain simply jammed. It has now been cleaned and oiled, and the curtain is in good working order."

MISS GRACE HAWTHORNE has given permission for a ticket benefit at the Royal Princess's Theatre on Monday, November 19, to Friday, November 30, on behalf of the Christ Church East London Halfpenny Dinners. All tickets bought direct of Mrs. Priscilla Jay, Christ Church Vicarage, Watney Street, E., will benefit the charity. Last year over 40,000 dinners were provided for 131*l.* 12*s.* 5*d.*, including all working expenses and a new cooker. This year want of funds delays the carrying out of the same object. "Hands Across the Sea," by Henry Pettitt, will be played each evening and on Saturday afternoons, and "The Love that Kills" (L'Arlésienne), on Monday, Tuesday, Wednesday, Thursday, and Friday afternoons, November 26 to 30. "The Love that Kills" is adapted from the French by Jocelyn Brandon, with the beautiful music of Bizet to L'Arlésienne, which was produced with such marked success at the Prince of Wales' Theatre at two matinées this year (the first of which was attended by H.R.H. the Prince of Wales and suite). It will be reproduced by Miss Grace Hawthorne and Miss Sophie Eyre at the Royal Princess's Theatre, with a special orchestra, ballet and chorus, at daily matinées (Saturdays excepted), commencing on Monday, the 26th inst.

#### IRONMONGERS' EXHIBITION.

THE well-arranged display of Messrs. Harry Hunt & Co., of 12 New Oxford Street and Newington Green, included samples of his excellent sanitary stoves, ranges, &c. The "Hygiene," a ventilating hall stove, by which an equable temperature is established throughout a house, is a handsome article. Ventilation is also secured by it, and while tempering the air to the required warmth an entire freedom from oppressive stuffiness is secured. Various sizes render it efficacious for use in churches, public buildings, schools, &c., as well as for mansions

and also small dwelling-houses. The "Argus" office stove is another variety of stove suitable for small halls, rooms, offices, &c. Messrs. Harry Hunt & Co. have secured other excellent results in their stoves, inasmuch as the combustion is under control, they will remain alight for months if required, and will consume coke, anthracite, and any smokeless fuel. They have also a new fireproof material for use for linings of stoves, ranges and furnaces, called the "Terra Fuego" cement, which can further be used as a wash for repair of cracks, &c., and as a surface wash also prevents deposits of carbon taking place.

Messrs. F. Whitfield & Co., of Oxford Street, Birmingham, who are the sole manufacturers of the patent "Sicker" safe, show a new safe which has just been made by them, and is now first exhibited. It is specially intended for the use of tradesmen. This form of safe will prove most serviceable, and the cost is exceedingly small. The need of such a safe has hitherto had to be supplied by the expenditure of as much money probably in locks and bolts where clients did not require the typical safe, often too large and too costly for their purpose. The office safes also meet an extensive requirement of the day. The "Sicker" safes are known, and have gained practical success in the satisfaction they have given all round. The safes are made in various sizes and for various purposes, for business houses, private houses, for bankers, jewellers, for deed chests, plate chests, &c., and they have proved themselves in many a fire as worthy of the trust placed in them to safeguard the contents committed to their protection.

Messrs. Appleton, Burbey & Williamson, electrical engineers, 91 Queen Victoria Street, E.C., carry out electrical work in all its branches, erecting and maintaining installations on both the arc and incandescent systems; temporary lighting as required for lectures, concerts, balls, and other entertainments; electrical transmission of power and propulsion in all branches; motors for light work; the erection and maintenance of private telephone lines for clubs, warehouses, asylums, &c. Advice can be had from them as to the working and management of accumulators for all purposes; among these will be found a pocket accumulator for small incandescent lamps; and, further, they undertake experimental works, and the carrying out of ideas for inventors. At their stand, No. 23, are exhibited, among other matters, the patent adjustable switches for main and branch circuits, which supply the demand for thoroughly reliable and durable switches for electric light and power installations. These are in different varieties and of graduated



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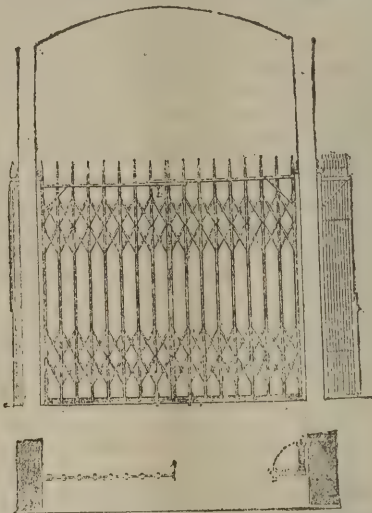
strengths; some have been specially designed to carry very large currents. In every case ample contact surface is provided for the amount of current to be carried. The display at the stand also includes switchboards, china switches, fuses, lampholders, ceiling roses, &c.; electrical measuring instruments, all electrical fittings and accessories, portable electric lamps and portable electric bell sets, and a new patent shade and globe carrier.

Messrs. Le Grand & Sutcliffe, 100 Bunhill Row, E.C., show their Norton's patent Abyssinian tube wells and pumps, awarded a gold medal (highest award) at the Health Exhibition, artesian well tubes, and boring tools for the same; lift and force pumps, deep-well pump-barrels for artesian wells, and double (7-inch) barrel wheel pump. The Abyssinian tube-wells have now been in use for over twenty years for permanent supplies, ranging from the requirements of a cottage to that of furnishing upwards of 300,000 gallons daily for towns, paper-mills, large breweries, and other purposes, in addition to which they have formed part of every military campaign, from the Abyssinian War down to the latest Nile Expedition. They are widely known, and it need only be said that they are simply driven into a water-bearing stratum, dispensing with the costly process of digging, while at the same time avoiding the risks of surface contamination to which dug wells are liable. They are frequently employed for deepening existing dug wells which have become polluted or run dry. As they can be withdrawn and redriven, they are very useful for obtaining temporary supplies for railway work and building operations, and for ascertaining water levels for drainage and other works. They are most suitable for gravel, coarse sands, chalk, and porous water-bearing strata, not being recommended for clays, marls, and fine sands. In strata that cannot be penetrated by them, and rock, an artesian well tube must be bored, and it is well known how successful Messrs. Le Grand & Sutcliffe are in these undertakings. The Norton's improved patent registering turnstiles, of which this firm are the patentees and sole makers, are also shown; but these are well known, another variety being the exit cage turnstile.

Messrs. King & Smith, 59 Haymarket, S.W., and the Stowe Works, Weedon, show an excellent arrangement for the cellar in their patent "Honeycomb" wine bin, and to which a gold medal and diploma of honour were given at the Anglo-Danish Exhibition. The construction of this wine bin is fairly claimed as a novelty. Each receptacle for a bottle is a separate tube made of terra-cotta, hexagon or honeycomb shape outside, and

circular within—just large enough to take a bottle easily—and, as the circle is only slightly larger than a bottle, the bottle beds down into the lower part and will not roll or shake about. The tubes are stacked in honeycomb fashion, in any space desired to be fitted up as a wine bin, and require no kind of fixing, as they fit into each other, and from ten to twelve tubes go to one square foot of wall surface. The advantages are obvious.

The Bostwick Gate and Shutter Company, Limited, 73 Queen Victoria Street, have fixed up various folding gates and shutters as samples of their useful specialties, which are well known also for their ornamental qualities. There is a folding steel dwarf gate for doorways, &c., folding steel gate for lifts and passages, and folding steel shutters for windows, applied



either outside or inside. The wonderful ease with which these gates and shutters open and close is remarkable, and they afford in the best of methods a most perfect protection, without causing the slightest obstruction of light or of air, and, as before said, the highest ornamental effect can be added. The sketch we give of the Bostwick Gate will convey some idea of an arrangement which has none of the commonplaceness of ordinary gates.

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Mr. James Gregson, of Bath Street, Bolton, the patentee of the "Perfectum" wall-pipes, &c., shows the newest and most perfect way of dealing with down spouts or stack-pipes, in full size and of various forms, with a novel variety of hangers, clips, and other fastenings, for pipes of other makers. These pipes are a perfect protection against damage and disfigurement of outside walls; also of the plaster and paperhangings inside rooms, through defective down spouts. They are very easy to fix and renew, because the nails, which are always intended to remain in the wall, are first driven into a joint within half an inch of the head. The "Perfectum" is quite an improvement on any down spout hitherto made, it having a 7-inch socket for sliding to wall-joints, which saves drilling and plugging, and for sliding out broken middle lengths for renewal without removing others or drawing the nails. It simply hangs on the nails just 1 inch from the wall to convey any escaping water clear down the pipe without wetting the wall, and to allow of their being painted all round. Each pipe hanging on its own nails, and not resting on the bottom of the 7-inch socket (which is bevelled inside), it will not retain the rust and dirt which accumulates between old-fashioned pipes in short sockets, which can seldom be separated without breaking two or three lengths, drawing the nails, and damaging the brickwork.

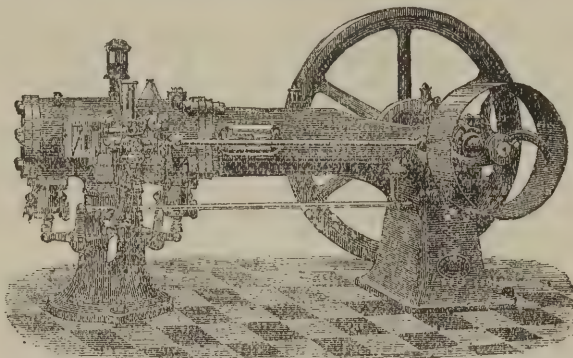
Messrs. Griffiths Bros. & Co., 4 Dashwood House, New Broad Street, E.C., and Bermondsey, have an exhibit that is well worth a long inspection in the samples of their manufactures of paints, varnishes, enamels, &c., which have been described at length in our columns before this. Specimens of executed work also to be seen at the stand afford a fair means of judging of the excellence of the manufactures. The oxidised enamel paints patented many years ago have become so much in demand, not only for the general business, but for decoration, for domestic purposes for re-enamelling baths, &c., and articles of metal, that a new department has been opened by the firm for their supply, in suitable tins and quantities ready for use.

Messrs. Abbott & Co., Newark-on-Trent, have on view their "handy hoist," which is well described as the cheapest machine for light weights ever offered. It is easily fixed, easily worked, easily kept in order, and easily repaired, and the worm and wheel gear will hold the weight in any position without running down. The No. 4 hoist has two speeds. It enables one man to lift 10 cwt. with the worm and wheel gear at a slow speed, and 2½ cwt. at a quick speed with the bevel-wheel gear, and to

lower by brake if desired. There is no business that requires a lift at all where this will not be found useful. The No. 5 hoist is for light weights (2½ cwt. with one man), and will save having an extra man in thousands of cases, and the cost will be saved possibly in less than six months, even when only occasionally used. The cost of these hoists is, too, exceedingly small.

Messrs. C. Portway & Son, "Tortoise" Stove Works, Halstead, Essex, show the patent slow-combustion close stoves. They are especially adapted for church and school heating, being simple in construction, easy of management, economical in consumption of fuel, and burning long hours without attention. The entire interior consists of Stourbridge clay ware, including the hearth on which the fire is laid; consequently no smell of burned iron can be perceived, as the fire comes in contact with the clay only. The stoves have proved a success, being both efficient and economic, and their merits have long been recognised by the public.

Messrs. Dick, Kerr & Co., of 101 Leadenhall Street, London, and 98 Mitchell Street, Glasgow, show the "Griffin" gas-engine, one of 6 horse-power, of double-acting horizontal type (as in the accompanying illustration, and which ranges from 1 to 20 horse-power), that drives a dynamo for lighting various ex-



hibits. A 2½ horse-power "Griffin" gas-engine, double cylinder single-acting vertical type, drives dynamos for lighting Messrs. Dick, Kerr & Co.'s own stand. Among the others is a ¼-horse power "Griffin" gas-engine, for driving rotary pump or hoist. These engines are notable for simplicity and economy, while their cost is small.

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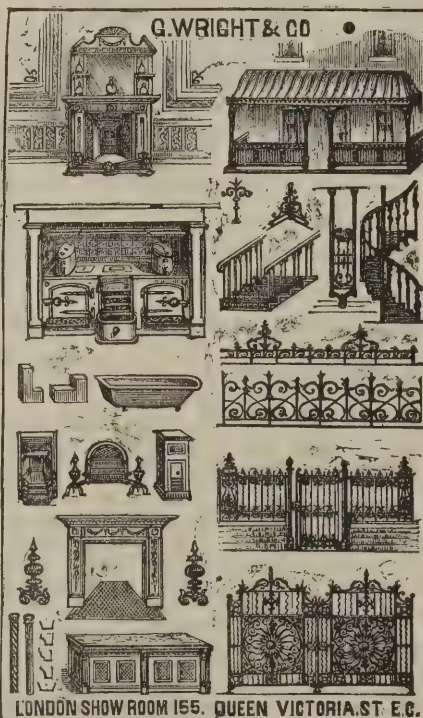
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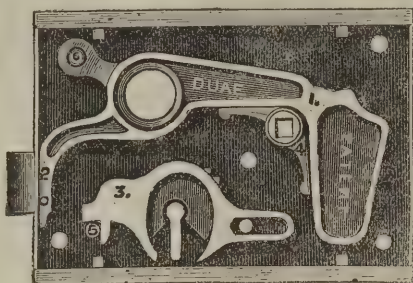


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WORKS, ROTHERHAM. Estab. 1854.



The accompanying sketch will explain a new patent lock shown by Messrs. Brown & Green, of Luton and Finsbury Pavement, E.C., when examined with the following description:—1. Self-acting latch working on pin 6; 3. Locking bolt, which, when thrown by the key over pin 5 against the latch-bolt at 2, effectually locks it, and the reverse action of the key unlocks it in the same manner. 4. Follower for working latch in the usual way. Attention should also be called to this firm's valuable patent "Grip" axle sash pulleys, as being the best,



strongest, simplest, and most secure. In fixing them no screws are required. It is only necessary to bore three holes and drive them in and they will be firmer without screws than the ordinary pulley is with screws. They do not weaken the pulley stile, are easily oiled, and the wheels revolve freely. The ranges and stoves exhibited deserve notice. Several simple improvements have with much ingenuity been thought out and carried into effect, which should be inspected. A marvellously cheap warming stove, on the slow and regulated combustion principle, is to be seen in the "Magnet" stove.

Harrison's new blind-line clutch (Mr. J. Harrison, Castle Bytham, Stamford) is a marked improvement (on a new principle) on other systems. The clutch takes hold of the cord very like one would do with the thumb and finger, the grip regulating itself automatically as the weight upon the cord is varied—the greater the weight to be sustained the greater the grip upon the cord; at the same time it will pass quite freely through the clutch when drawn in the opposite direction. The clutch is composed of two arms moving in the same plane, but pivoted on different centres; the lower arm is slotted at the outer end, the upper arm being shaped to pass through the

slot, and is turned upon the under side to form a hook to which the loose end of the cord is fixed for the purpose of drawing the clutch out of action to lower the blind. The cord is passed through (to the blind-roller pulley) the slot in the lower arm, and is clutched between the end of the upper arm and further end of slot. The arm pivots are placed to cause the end of the upper arm to slide outward in the slot and close upon the cord when the arms are moved in the direction of the pull upon the cord; therefore a slight pressure upon the cord between the two arms is sufficient to draw the arm with the cord, the grip increasing with the weight to be sustained. The arms are held up by a spring to give the slight required pressure on the cord. The action of the clutch is such that, were it made of sufficient strength, it would hold an ounce or a ton weight, and only give just the required grip in each case. The clutch is simple, with nothing to get out of order; it cannot damage the line, and is applicable to ventilators, trap-doors, &c.

The stand of Mr. A. G. Hamilton (No. 123), artificer in wrought-iron, forms one of the most interesting exhibits, not only for the variety and excellence of design and workmanship, but also for the artistic manner in which it is fitted up. He has erected the "Quintin Matsys Forge" as an ancient cottage, much resembling one of the workshops in "Old London" at the late South Kensington Exhibitions, which admirably shows off the specimens of wrought-iron work he is exhibiting; one of the best is a gong, a beautiful example of scrollwork. Standard floor lamps, kettle-stands, music-stands, banner-screen stands are shown, all possessing artistic merit; also wrought-iron swinging lamps of handsome design. A specialty is made by Mr. Hamilton of wall-lamp brackets and electric-light fittings, the latter being specially worthy of notice. Mr. Hamilton has a large number of articles on show at his works, The Quintin Matsys Forge, 14 Griffen Street, York Road, London, S.E., where we would recommend our readers to pay a visit.

At stand No. 97 Mr. James Dickson, of 48 Gray's Inn Road, has a fine show of patterns of every description of wire-work. Lime and sand screens for contractors' and builders' use, both socket and laced, sieves of every kind, and for all purposes, in brass, copper, tinned and ironware, paint strainers; also Watson's patent ventilating cowls and gas stoves. The firm was established in 1769, and maintains its high reputation for good workmanship.

Messrs. Mainzer & Kempthorne, of Bloomsbury Mansions, Hart Street, W.C., are showing several samples of their marble mosaic pavements. The choice of design and colour is very

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varied, and ranges from plain work to very elaborate and artistic treatment. We were specially struck with the freedom of the designs and the excellent workmanship of the samples exhibited. Messrs. Mainzer & Kempthorne inform us that, by an improved method in the manufacture of their marble mosaic, they are enabled to carry out work at greatly reduced prices.

We have already referred to many uses to which silicate cotton can be applied as a fire preventive. Its most recent development is in the direction of mitigating the extreme climatic influences of heat and cold. The interior of an iron building, for instance, is padded with silicate cotton covered with wire, and the consequence is that neither heat nor cold can penetrate. It would be impossible to give better illustrations of its uses than that the Russian military authorities have adopted it in their portable huts on the Galician frontier, to mitigate the extreme cold in winter, and that it is used in India as a protection against heat. Silicate cotton is also a non-conductor of sound as well as heat and cold; and these inestimable advantages suggest its application generally, not only to iron but to buildings of every description. From actual tests a 1-inch padding of silicate cotton is a better protection against cold than 12 inches of brickwork. There is no question that this excellent provision for comfort is rapidly forcing its way to the front from sheer merit.

In referring to Mr. F. Benson's exhibit of iron wine bins at the Ironmongers' Exhibition in the last issue of *The Architect*, it was erroneously stated that the "lathe is used in turning." The correct reading should be, "the lathe is used in binning."

The St. Pancras Ironwork Company have contented themselves with exhibiting two beautiful models, one representing a complete stable, exquisitely-fitted, with every improvement of sanitary paving, drainage, ventilation, &c. The other model is one of an elegant spiral staircase.

Messrs. Ewart & Son, 346 Euston Road, have the "Lightning" geyser shown in various sizes, and its name aptly describes the rapidity with which hot water is discharged into the baths, which also form part of the exhibit.

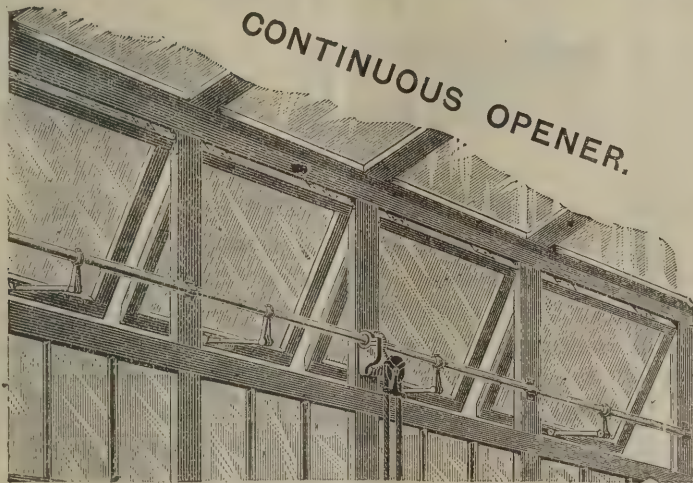
Mr. Robert Adams, 67 Newington Causeway, S.E. (Adams's Building Trades Emporium), shows a new principle developed in the Victor spring, by which the door closes itself without any rebound, but with a barely perceptible check. If the door be closed with a bang no injury would result. This obtained a gold medal (highest award) at the Cardiff Exhibition. An improved rising butt is silent in action without rebound in closing door, which can be set open for any length of time.

Mr. Robert Adams shows enamelled slate chimney-pieces (Messrs. Corfield & Morgan, Albion Slate and Marble Works, Cardiff), and designs of the same in white marble. The whole of the work will be able to be seen at the emporium after the close of the Exhibition, as representative stock will be kept there. Messrs. Corfield & Morgan also obtained the gold medal (highest award) at the Cardiff Exhibition. Mr. Samuel Elliott, of Newbury, whose excellent wood mouldings we have often before alluded to, shows the Elliott's patent "perfect simplex" metal weather-bar for casements opening inwards, and all existing windows and doors, to which a medal was awarded at the Brussels Exhibition this year. Messrs. Carter & Aynsley's (54 Bishopsgate Street Without) specialties in lock and door furniture, altar fittings and brass-work fittings, &c., cannot be overlooked by visitors, and the elegant mahogany and glass structure containing them, besides having a prominent position, affords every opportunity of examining the excellent work of this firm. Messrs. Charles Toope & Co., Stepney Square, E., show their patent Champion and Perfection boilers, which are invaluable to the owners of glass-houses where heat is required. There are also their eclipse heaters, patent propagators, and patent garden frame heaters, which supply the purposes long wanted. Mr. Thomas Heron, 88 St. John's Road, Upper Holloway, shows the efficiency and economy of his patent duplex gas-burner over the ordinary kind by direct contrast: two model gas-meters supplying respectively an ordinary and a patent duplex burner. These are introduced at the Houses of Parliament, at Dr. Quain's, Harley Street, and at Sir Andrew Fairbairn's, Portman Square. A new burner, shown for the first time, gives 100 candle-power to 12 feet of gas. The patent "Bland" copying machine is seen at work at the stand of Messrs. William Bland & Co., and the specimens executed leave nothing to be desired. The patent ball-bearing castors are also shown. The offices are at Grey Friars, Leicester. Messrs. Arden Hill & Co., Etna Foundry, Birmingham, show the patent "Acme" metal, fires an admirable system of warming, giving great scope for ornamental effect. The "Phoenix heater" is a powerful oil stove free from smoke or smell, of highly ornamental type, shown by the makers, Messrs. S. Clark & Co., of the Syphon Works, Islington, at their stand, and is most valuable for sitting and bed rooms, conservatories, &c. Mr. Charles Gay Roberts, of Haslemere, shows his well-known rain-water separator; Mr. James Adams, 7 Union Street, Borough, the "Slave" pneumatic check-door spring

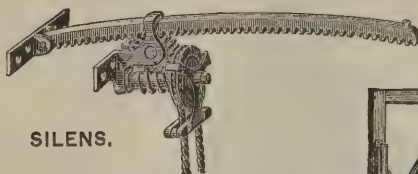
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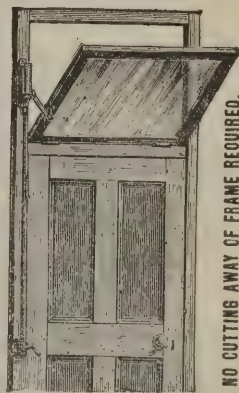
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SIRS,—I have pleasure in testifying that I have used Leggott's Silens Adjustments for various buildings to high skylights, fanlights, and top parts of windows, and in every case they gave satisfaction.

They are secure in whatever position, whether the window is open or closed, and are quite simple and workable in their action. I prefer them to any other that I have seen or used for the above-mentioned purposes.

Messrs. W. & R. LEGGOTT, Bradford.

I remain, yours obediently,

R. DAVIES Architect.

Considerably Reduced Price List, November 1, 1887.

ALL WORK ENTRUSTED TO US GUARANTEED SATISFACTORY.

W. & R. LEGGOTT, General Brass and Ironfounders and Finishers, Makers of Patents and Specie  
**235 HIGH HOLBORN, LONDON, W.C.;**  
**109 HOPE STREET, GLASGOW; SILENS WORKS, BRADFORD.**

TELEGRAPHIC ADDRESS—"SILENS BRADFORD."



hinges; and Messrs. Willing & Co., Limited, Clerkenwell Green, their patent enamelled copper letters and enamelled iron and patent electric signs. Messrs. Hindle, Norton & Co. show their "Acme" door check and spring in various kinds, which have taken highest awards at Edinburgh, Adelaide, York, and Bolton Exhibitions. Mr. H. L. Müller, of 22 Mary Ann Street, Birmingham, shows the Müller Alpha patent gas-making machine, which has made so great a revolution in supplying lighting requirements in so many directions. It is familiar to manufacturers, and is appreciated for its steadiness and uniformity in working as well as for its economy.

#### NATIONAL REGISTRATION OF PLUMBERS.

A LARGE public meeting of plumbers, architects, and others was held on Wednesday evening in the Technical School, Belfast, Mr. J. Mackenzie, C.E., presiding. Mr. F. W. Smith mentioned the steps which had been taken to form a class for instruction in plumbing work in co-operation with the Worshipful Company of Plumbers, London. It was resolved "That it is desirable steps should be taken to form a local Council to co-operate with the Worshipful Company of Plumbers in support of the system of registration as laid down in the rules of the guild."

Ex-Provost Moncur presided at a meeting just held at the Technical Institute, Dundee, on the occasion of the opening of plumbers' classes there; and at the monthly meeting of the Registration Committee at the Guildhall on Thursday, about 750 fresh applications for registration were reported, 200 being from master plumbers and 550 from operatives. About 600 of the applications were received from the District Councils acting in conjunction with the Plumbers' Company in the provinces.

Plumbers registered since October 1, 1888:—

##### London Masters.

ALLISON, B., 57 High Street, South Norwood, S.E.  
MILAN, J. W., 98 Park Road, Haverstock Hill, N.  
MORRIS, S., 54 New Street, Kennington Park Road, S.E.  
MYRING, J., 69 Abbey Road, St. John's Wood, N.W.  
PRATT, J. L., 103 Burghley Road, Highgate, N.  
THOMAS, H., 246 Upland Road, East Dulwich, S.E.  
WHEELER, G. J., 3 Russell Road, Wimbledon.

##### London Journeymen.

ALLISON, R., 66 Hatfield Street, Blackfriars, S.E.  
BOSTEL, W., 13 Elfort Road, Drayton Park, Holloway, N.  
CHANDLER, J. A., 25 Hamilton Road, Old Brentford, W.  
COLEMAN, J., 18 Stonefield Street, Barnsbury, N.  
COOPER, W., 1 Guernsey Villas, Beachcroft Road, Leytonstone, E.  
CRUTTENDEN, F., 8 Frognaal Villas, Chislehurst, S.E.  
GENT, G., 11 Brigadier Hill, Enfield, N.  
GOLSBY, W. T., 83 Ravensbourne Street, St. John's, Deptford, S.E.  
GOULD, W., 32 Warlock Road, Paddington, W.  
JONES, W. R., 20 Nelson Street, South Street, Ponders End, N.  
MANSFIELD, C., 24 Abyssinia Road, Battersea, S.W.  
MITCHELL, J., 104 Albert Road, Kilburn Park, N.W.  
SIMPSON, J. B., 269 Shakespeare Road, Herne Hill, S.E.  
STACEY, E. J., 10 Gee Street, Clarendon Square, N.W.  
STEVENS, J. A., 29 Warriner Gardens, Battersea, S.W.  
WHITE, W., 31 Lowden Road, Herne Hill, S.E.  
YOUNG, R., 66 Lillington Street, Pimlico, S.W.

##### Provincial Masters.

ANDERSON, J. F., 2 Bath Street, Aberdeen.  
AUCHINLOSS, M., Church Street, Moffat, N.B.  
AUTY, J., Huddersfield Road, West Town, Dewsbury.  
BEAVEN, W., 132 and 133 Westgate Street, Gloucester.  
BEDDESON, H. F., High Street, Egham.  
BERRY, W., 7 Kingsmead Square, Bath.  
BEST, J., 23 and 24 Old Town Street, Plymouth.  
BOTTOMLEY, F., Savile Road, Savile Town, near Dewsbury.  
DARE, T., 3 Julia Terrace, Burnham, Somerset.  
DAWKES, W., 69 High Street, Leamington.  
DUNN, W. H., 7 Queen Street, South Shields.  
DYSON, A. B., 68 King Cross Street, Halifax.  
HEPBURN, J., Well Street, Moffat, N.B.  
HOLLIER, W., Sheepwash Lane, Great Bridge.  
HORSFALL, F., Newcombe Street, Elland, Yorkshire.  
HOSKIN, W. H., Fore Street, Plympton.  
MASON, G. H., 54 High Street, Skipton.  
MERCER, T., 83 and 85 George Street, Stranraer, N.B.  
MOORHOUSE, A., Market Place, Kirkby Lonsdale.  
MORRIS, S., Crown Point, Denton, near Manchester.  
MORRISON, R., 39 North Street, Scarborough.  
PARK, T., 2 Fox Street, Preston.  
RAWORTH, W., 160 Waterway Street, Nottingham.



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PALL MALL GAZETTE, June 20, 1887.

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WALSHAW, J., 95 Commercial Street, Batley, Yorkshire.  
WILKS, G. B., Westbourne, Emsworth.

*Provincial Journeymen.*

ASHTON, C. W., West Green, Cottingham, Hull.  
BADGER, W. J., 3 Clyde Street, Adamsdown, Cardiff.  
CARTWRIGHT, T., 51 Fox Street, Sheffield.  
CASELY, E. J., Cleeve House, Fraser St., Bedminster, Bristol.  
CRAVEN, T., 243 Clifton Terrace, Fratton Street, Landport.  
EVANS, R., 3 Exmouth Villas, Church Road, Teddington.  
FINDEN, J., care of J. Warner, High Street, Alton.  
GARTHWAITE, G. B., 98 Corporation Road, Middlesbrough.  
GILLAM, A., 16 Phillip Street, Hoole, Chester.  
HALL, W., 18 Bengal Street, West Hartlepool.  
HINCHCLIFFE, G., 103 Bevois Street, Southampton.  
L'ANSON, J. L., 47 Hind Street, Stockton-on-Tees.  
LEAT, H. C., 1 Richmond Street, Totterdown, Bristol.  
LEDGER, W., 8 Villiers Street, West Hartlepool.  
LOOSE, A. G. M., Audley End, Saffron Walden, Essex.  
MAISEY, W. H., Oxford Street, Woodstock, Oxon.  
MARTIN, L. P., 54 Coburg Street, Plymouth.  
MAYBERRY, T., 9 Warwick Road, Sutton.  
MERCER, W., 85 George Street, Stranraer, N.B.  
MILES, E., 18 Rushmore Place, Leamington.  
ORAM, G., Manor Farm Cottage, Aldershot.  
PACK, R. B., West Hyde, Luton Hoo Park, Luton.  
PARKINSON, J. F., 33 Crown Street, Kingston, Portsmouth.  
PINNICK, W. R., 32 Rochester Terrace, Northam, Southampton.  
PISTELL, W. H., 1 West Street Place, Fisherton, Salisbury.  
PRESS, W. J., Abingdon Street, Burnham, Somerset.  
PRIGG, A. E. J., Grittleton, Chippenham.  
ROBERTS, G., Woodside Cottages, Tolworth, Surbiton.  
SERRIDGE, H. B., 18 Wellington Street, Plymouth.  
SHARP, J. A., 16 Queen Street, Lumb Lane, Bradford.  
SKINNER, T., 47 Mill Street, Hereford.  
SLOAN, J. McM., 3 Victoria Street, Newton Stewart, N.B.  
SMITH, J., High Street, Annan, N.B.  
SNELLING, J. W., Normanhurst Court, Battle.  
STUTCHBERRY, P. F. J., 13 Amoy Street, Bedford Place, Southampton.  
WEBB, A. E., 10 Beaufort Street, Brynmawr.  
WELLS, J., 4 Mount Zion Place, Brighton.

AMERICAN NOTES.

A SAN FRANCISCO Syndicate has purchased a tract of timber land, containing 625 square miles, in California from the Central Pacific Railroad Co. This tract is densely covered with large sugar pine-trees. It lies west of Lake Tahoe in the northern part of El Dorado Co., and has been left intact owing to the lack of transportation facilities. The present company proposes to build a flume to Folsom, 50 miles distant, and spend about 1,000,000 dols. in opening up one of the most magnificent timber tracts in California.

A refuse destructor has been constructed, at a cost of 11,000 dols., as an experiment at Chicago. The furnace has been in operation since last April. The capacity is 150 tons per day, though it has never been pushed to its utmost, owing to the expense of cartage. During June the furnace consumed 103 tons daily for twenty-six working days, at a cost of 25½ cents per ton for labour and coal, exclusive of the cost of delivering the refuse. With 150 tons daily this cost could probably be reduced to about 17 cents per ton.

LIVERPOOL MASTER BUILDERS' ASSOCIATION.

THE annual banquet of the Liverpool Master Builders Association was held on the 15th inst. Mr. J. Stevenson Jones president of the Association, was chairman.

Mr. A. G. White proposed the toast of "The Mayors and Corporations of Liverpool, Birkenhead, and Bootle."

The Mayor of Bootle expressed his regret that the Mayors of Liverpool and Birkenhead were prevented being present. Alluding to the advance that had been made in the population and importance of Bootle in recent years, Mr. Wells said in 1868 the population of Bootle was 15,000; they had 2,000 houses, and the rateable value was 64,000/. In 1871 the population had increased to 16,000, in 1881 to 27,000, and it now stood at 51,000. The number of houses in 1871 was 2,500; in 1881 4,300, and now it was 7,000. The rateable value of property had increased from 64,000/. to 400,000/. In fact, the increase had been marvellous. He considered that the ratepayers of Bootle had been wise in choosing some builders to represent them in the Corporation. He thought there were several men who were members of that Association who had done honour to themselves as builders and as members of the Corporation of Bootle.

TURPIN'S

PARQUET FLOOR,

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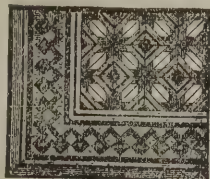
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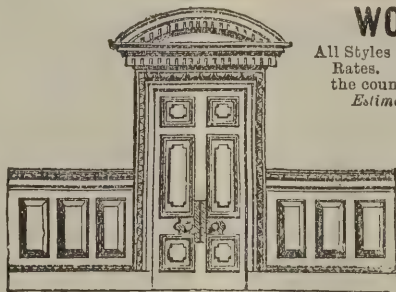
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150,000 ft. super. in Stock, ready for Laying,  
RIGA INCH OAK FLOOR BOARDS.  
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Immense Stock always ready for Laying.



THIN PARQUET

(Turpin's Patent). 5-16 inch thick, prepared on deal back laminations, equal in wear to inch Solid Parquet. Used for Veneering old existing deal floors, and is susceptible of removal at pleasure. See Construction.



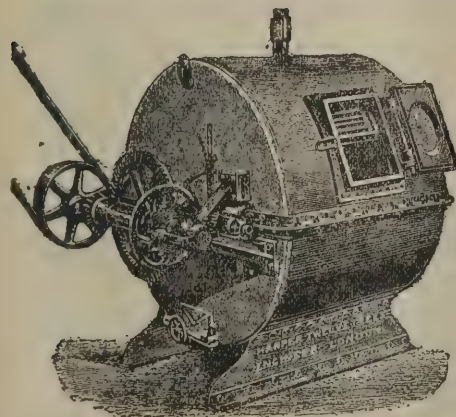
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All Styles executed for the Trade at Special Rates. Skilled Artisans sent to all parts of the country.  
Estimates and Designs on Application.



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HARPER TWELVETREES'

New System of Washing Machinery

For PUBLIC INSTITUTIONS, HOTELS, SCHOOLS, & MANSIONS,

As used in Her Majesty's Laundry, Devonport Steam Laundry, Rangoon Steam Laundry, Suez Steam Laundry, Whitechapel Infirmary, Mont Dore Hotel (Bournemouth), &c., &c.

Is specially recommended to Architects as the most perfect and economical.

Plans and Specifications for completely furnishing Hand or Steam Laundries given to Architects and Engineers; together with Prospectus of Washing, Rinsing, Boiling, Wringing, Drying and Iron Machines, Hydro-Extractors, Drying Closets, Stoves, Engines, Boilers, and all Laundry requisites.

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FLOORING.

WALKER & ALLIOTT (late of GEARY & WALKER),

7 John Dalton Street, MANCHESTER.

BLOCKS IMMOVABLE.

Being "Keyed" to Substructure by  
METAL KEYS,

And by an

Adhesive & Preservative Mastic

Speciality: OAK AND DARKENED OAK.



Mr. Pendleton proposed "The National Association of Master Builders." It was, he said, a very important Association, representing as it did masters in thirty-seven of the principal towns in Great Britain. It was established something like ten and a half years ago, and its career had been thoroughly prosperous. Their local Association had been assisted very much indeed by the strenuous efforts which the National Association had made for the benefit of the building trade. He expressed the hope that the deepest interest would be taken in the Employers' Liability Bill, which was a very important measure, and considerably affected their trade.

Mr. J. C. White, whose name was joined to the toast, said at the present time the National Association was particularly engaged with the question of the Employers' Liability Bill, which had recently been before Parliament, and was to come on again. They preferred the old Bill to the new one. Under the circumstances he thought that the Government Bill, as amended, would fall to the ground. All the employers wanted was justice between themselves and their men, but they did not consider that they had it in either of the Bills proposed. He did not think that the building trade throughout the kingdom generally, or the British public as a whole, had paid sufficient attention to that Bill. It meant a great deal to them in the future; it meant that their houses would cost them a great deal more money, and it would also entail on them other expense. Messrs. Broadhurst and Burt wanted the limit of liability to be 500*l*. The Bill as it was framed showed no favour to the builder whatever, but practically rendered him responsible for every accident, no matter how much the individual employed be responsible for that accident. They therefore considered that the master builders were most unjustly treated, and that some change in the Bill was needed.

Mr. Royden, M.P., explained that he was a member of the Parliamentary Committee to which Mr. White had alluded, and therefore thought he ought to say a word or two in regard to the Employers' Liability Bill. They had a very long discussion upon the merits of that Bill, clause by clause, and there were several large employers of labour upon that committee. They all desired to be generous to their employes. The employers of labour upon that committee and the committee generally were most anxious that in all the clauses they should deal in the most liberal and generous spirit with those of their unfortunate workmen who might come to some injury in the course of their trade. The representatives of the workmen

wished the limit to be 500*l*., and wished a further concession in regard to other matters. It was urged by them that a man's life was of value to all those who were dependent upon him, and that the least amount at which that life ought to be assessed was 500*l*. He pointed out that in giving a certain amount of damages they did not desire to assess the value of the life of any man. It was quite impossible to put a value upon any man's life, because the life of the humblest workman in their employ was as valuable as the life of any of them. Therefore, no one should attempt to value that life at a mere monetary value. But a penalty was fixed rather as a means of causing every employer to take the utmost precaution that human skill, foresight, and intelligence could devise for the protection of his workmen. That was their object in fixing a penalty. In fixing a penalty of 200*l*. or 250*l*., it was thought that, apart from the question of humanity or goodwill to the workmen, employers would guard with the most jealous care and devise every means they possibly could for the perfect safety of the lives of those they employed. Then the question of common employment was in his opinion a perfectly fair and legitimate reason why the employer should not be liable under those circumstances. He was exceedingly sorry that the representatives of the men had found it their duty or their interest to oppose the Government Bill. His own impression was that it was conceived in the fairest and most generous spirit towards them so far as the members of the committee were concerned. While the committee and the House of Commons must of necessity act with the strictest and most impartial sense of justice towards employers, they were equally desirous to act in the most generous spirit towards working men, be their trade whatever it might.

Mr. G. E. Grayson proposed "The Liverpool Master Builders," and mentioned the great service that the Association had done towards preventing those unhappy strikes which formerly entailed untold misery upon the workmen and those dependent upon them, diverted capital away from building speculation, and caused a ruinous loss to the employers.

Mr. Green, who replied, said that the Association tried to defend not only the master builders but their employes as well, and they felt that undue pressure was put upon them in the Bill which it was proposed should be passed into law.

The other toasts were "The architects, surveyors and civil engineers," proposed by Mr. C. Tomkinson and responded to by Mr. Blair (surveyor of Bootle) and Mr. Thorburn (of Birkenhead); "The iron trade and kindred associations,"

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Hot Bath Lightning Geyser.  
in 5 Minutes.

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No more Porous Bricks and Damp Walls.

Use **STUNCILLAN DAMP-PROOF SOLUTION** for

Ort Brickwork and Damp Walls.

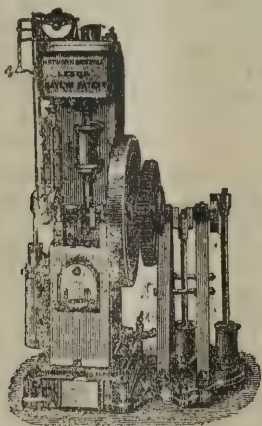
**ASPLAND & CO.,** Stafford St., Peckham, S.E.



given by the Chairman and acknowledged by Mr. Shield; "The city and trade of Liverpool," "Our guests," "The President," and "The operatives."

### NOTES ON NOVELTIES.

**Water Supply.**—It will be interesting to our readers, no doubt, if we refer to the merits of the Davey safety motor, manufactured by Messrs. Hathorn Davey & Co., of Leeds, in its application to pumping purposes. The firm have a decided pre-eminence for motors of every description, particularly for those of small size, such, for instance, as we illustrate below. This is the desideratum for the water supply of country-houses, public institutions, &c., and since its introduction in 1884 it has met with uniform success. It has many obvious advantages over anything of its kind, and has the power of much larger motors, requiring of course less



room and less fuel. Absolute safety is insured from the fact that the Davey motor is a vacuum engine of simple construction, worked by steam at atmospheric pressure, whilst other essential advantages are that the motor is practically noiseless, and from its extreme simplicity dispenses with the services of an engineer. We do not think that a more modern, complete, or

efficient motor is to be found, and no doubt many of the difficulties in obtaining a perfect water-supply which an architect meets with would be removed by its use. Its merits may be briefly summarised as safety, simplicity, efficiency, and economy.

### PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

#### APPLICATIONS FOR PATENTS.

16219. William Barber Press, for "Improvements in cistern-valves." November 9, 1888.  
16234. John William Henry James, for "Improvements in apparatus for calcining cement materials, hydraulic lime, plaster of Paris, and like substances." November 9, 1888.  
16262. Percy John Neate, for "Improvements in apparatus for the manufacture of Portland cement." November 9, 1888.  
16285. Joseph Thomas Nicholls, for "A new window-sash holder and burglar-proof bolt." November 10, 1888.  
16307. George Watson, for "A reversible hydraulic gas-valve to be fixed between retort and gas main on retort bed, applicable also to regenerative furnaces." November 10, 1888.  
16323. Auguste Victor Bouvier and Jules Billoré, for "Improvements in the manufacture of bricks, tiles, and other like articles." November 10, 1888.  
16357. Thomas Mostyn Norris, for "Improved fastener for holding in position short window curtains." November 12, 1888.  
16365. William Brett, for "Improvements in a new fire-escape and apparatus connected therewith." November 12, 1888.  
16408. John Sharples, for "Appliances for flushing the pans of water-closets." November 13, 1888.  
16410. Frederick Wilfred Scott Stokes, for "Improvements in revolving furnaces for burning, calcining, or roasting cement, lime, ores, or similar substances." November 13, 1888.  
16457. George Gordon Brodie and James Damrel Prior, for "New or improved apparatus for approximately indicating the temperature of the ovens of cooking ranges and kitchen ovens." November 13, 1888.

## ORIENTAL CARPETS.

Oldest Established Importers,  
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Levant Warehouse,  
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See New Lists for Prices, &c.

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A COMPLETE ORGANISATION  
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required by the Architectural, Surveying, and Engineering  
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In One Development and Washing.  
Best Medium for Reproducing PLANS  
from TRACINGS.

**J. R. GOTZ,**  
19 BUCKINGHAM ST., STRAND, LONDON.

## GRUNDY'S PATENT WARM-AIR VENTILATING FIRE-GRATE.

The novelty, superiority, and advantage of this patent consist in the heating surface being greater than any other Fire-grate introduced to the public. It is very simple in construction, and is made in the form of a Stove, the back of which is semicircular in shape, with gills behind and smoke-nozzle on top, all cast in one piece. The same can be attached to any design of a Register or Stove front. It is very suitable for schools, class-rooms, waiting-rooms, hospitals, offices, dormitories, and dwelling-houses, from the cottage to the mansion. Design and specification post free on application.

### TESTIMONIALS.

9 Victoria Chambers, Westminster, S.W.  
SIR,—I have much pleasure in testifying to the efficiency of your patent warm-air fire-grate. It has been very successful, and given every satisfaction where I have used it.

Yours, &c., JAMES WEIR, F.R.I.B.A.,  
6 John Street, Bedford Row, W.C.

From Hon. and Rev. G. G. C. TALBOT, M.A., Withington,  
Cheltenham.

DEAR SIR,—You will be gratified to hear that the school is completely warmed by your new grate. It is the most economical and efficient that I have ever seen.

Mr. John Grundy.

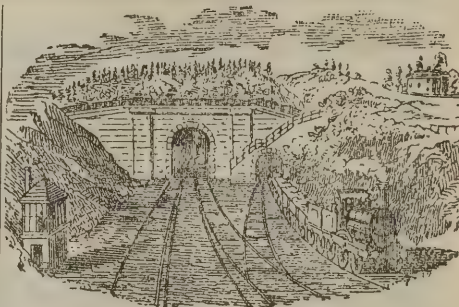
### ACROSTIC.

Just listen, friends, to what folk say  
Of Grundy's patent warm-air grate,  
How with the fresh air channels they  
Not only warm, but ventilate.

Give wondrous heat, burn little coke,  
Require but slight attention paid,  
Unequalled for consuming smoke,  
No better grates were ever made.  
Do try just one of Grundy's glo,  
You then will all its merits know.

### APPLY TO

**JOHN GRUNDY,**  
Warm Air Consulting Engineer,  
30 Duncan Terrace, City Road, London.  
Works: TYLDESLEY, near Manchester.



BOX TUNNEL, G. W. RAILWAY (East End).  
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We are prepared, as heretofore, to supply these sound  
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addressed to

**YOCKNEY & CO. (Sole Owners),**  
CORSHAM DOWN QUARRY,  
CORSHAM, WILTS.

Note.—No Connection with the other BATH  
STONE FIRMS.





16468. Oliver Phalp, for "Improvements in skylights and ventilators." November 13, 1888.

16509. Andrew Guthrie Suther and Thomas Legat, for "Improved composition for cleansing, whitening, and disinfecting stone passages, stairs, &c." November 14, 1888.

16597. Samuel Rideal, for "Improvements in means for advertising and displaying the names of streets and places, and for giving publicity to trade and other notices, and for other purposes." (Complete specification.) November 15, 1888.

16610. John Somerville and Alexander Allan, for "Improvements in apparatus for the prevention of stoppages in gas ascension pipes, and increasing the illuminating power of the said gas." November 15, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

5932. Charles James Henderson, for "Improved means of heating the air of apartments." April 21, 1888.

8004. David Gill, for "Improvements in wind guards to protect the tops of ventilating shafts and chimneys." June 1, 1888.

14137. Thomas Edwin Bickle, for "A safety catch for lifts, hoists, cages, or skips." October 2, 1888.

14179. James George Killey, for "Apparatus for inspecting the interiors of pipe sewers and the like." October 2, 1888.

14202. Edwin Samuel Fletcher Mann, for "Improvements in apparatus for opening and shutting windows and shutters." October 3, 1888.

14364. Francis Murray Rogers, for "Improvements in fastenings for doors, windows, and the like." (Stuart Reid, New Zealand.) October 6, 1888.

14408. Arthur Jackson, for "Improvements relating to check, feed, and other similar valves." October 8, 1888.

14547. William Parry, jun., and Richard Griffith, for "A new or improved automatic keyless lock." October 10, 1888.

14681. Joseph Tollerton, for "Improvements in fireproof curtains for the stages of theatres, and the like." October 12, 1888.

14724. Lawrence Wilson, for "Improvements in parquetry and other similar composite wood and artificial wood surfaces." October 13, 1888.

14755. Kate Caroline Howarth, for "An improved appliance for use in connection with the grates of domestic fireplaces." October 13, 1888.

15017. Frank Kendal, for "An improved electrical indicator

to show from which room or station a bell has been rung, in domestic electric bell and telephone circuits." October 19, 1888.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

17264. Thomas John Hancock, for "An automatic apparatus for the opening of lavatory doors and other such doors on prepayment." December 15, 1887.

266. Felix Tonnar and Wilhelm Schouren, for "Improvements relating to the ringing of church and other bells and to apparatus therefor." January 6, 1888.

494. James Hilton, for "An improved method of fireproofing mills or other buildings." January 12, 1888.

809. William Henry Tonks, of the firm of William Tonks & Sons, for "Improvements in latches or fastenings for doors, casements, skylights, fanlights, show-cases, and other like hinged or pivoted articles." January 18, 1888.

14709. William Horsfall, for "A new or improved construction for burning towns' and other refuse." October 13, 1888.

14750. Clement Waxin and Augustin Clery, for "An improved cement or artificial stone." October 13, 1888.

#### PATENTS SEALED, NOVEMBER 16, 1888.

12494. William Head, for "Improvements in apparatus for raising and lowering Venetian blinds." September 15, 1887.

13307. George Williamson, for "Improvements in apparatus for enabling the fastenings of turnstiles, doors, gates, barriers, or platforms to be released, and for the collecting the fee in connection therewith." October 1, 1887.

14851. James Coulter, for "Improvements in stone-dressing machinery." November 1, 1887.

14997. John Hanson, for "The treatment of alkali waste for use in the purification and deodorisation of sewage and impure waters or matters." November 3, 1887.

15065. Frederick Ransome, for "Improvements in the manufacture of cement." November 4, 1887.

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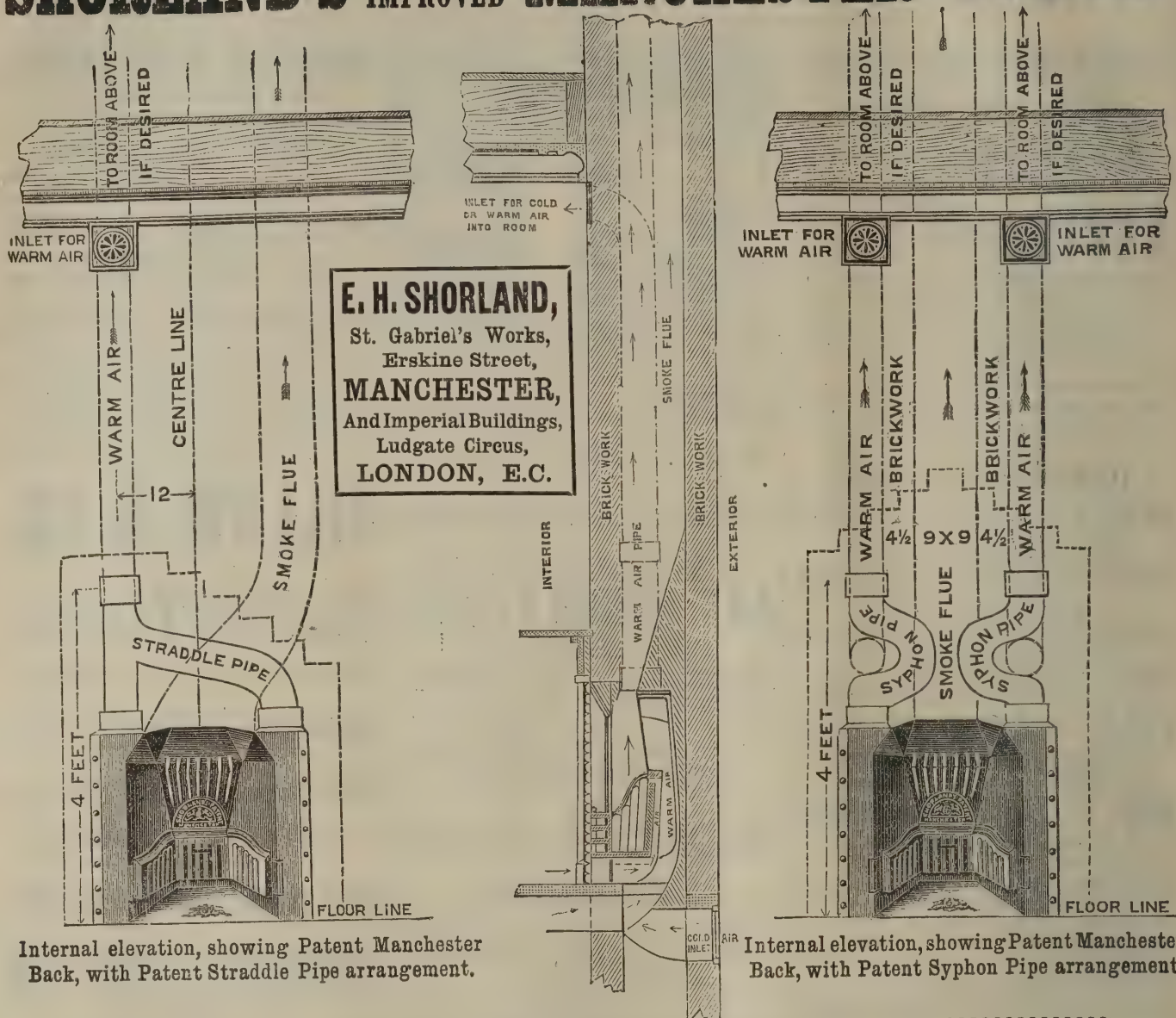
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# The Architect.

## THE WEEK.

AN exhibition of the works of BARYE, the sculptor, will be held in the Ecole des Beaux-Arts, Paris, in the spring of 1889. It will be got up in order to obtain funds to pay for a memorial of BARYE, which is to be erected in Paris. Fine examples in "cire perdue" of the sculptor's statuettes will be lent with the water-colours and other drawings which served for studies of his works.

MR. C. D. E. FORTNUM, F.S.A., some time ago deposited his collection of works of art on loan in the Ashmolean Museum, Oxford. He has this week offered them to the University as a gift. The collection ranges from the classical period of Greek art to the period of the Renaissance; it contains many altogether unique objects, and, in the Italian series, is especially rich. Mr. FORTNUM's liberality will help to remove the incompleteness of the Ashmolean Museum, but we hope he has stipulated that fewer impediments will be offered to visitors who may desire to see his collection.

THE Committee of the South Wales Art Society and Sketching Club held a meeting at the club-room, Working Street, Cardiff, on Friday evening, under the presidency of Mr. EDWIN SEWARD, architect, the vice-chairman. The hon. sec., Mr. J. A. SANT, showed that the accounts of the recent art exhibition in the Public Hall, although not entirely closed, had a small balance in favour of the Society. This result was in great measure due to the kindly action of the Marquis of BUTE, the secretary reading a letter from Sir W. T. LEWIS, who, on learning of the efforts which had been made to insure the success of the exhibition, had kindly enclosed a cheque for fifteen guineas, also congratulating the Society on the work just accomplished. Reference was made to the fund which was being raised by the Society to assist Mr. W. GASCOMBE JOHN, one of the sculptor members, in his travels in Greece and Italy, and which is to be added to the corporation fund for that purpose. Mr. SEWARD stated that Lord WINDSOR had generously consented to head the Art Society's fund, and that he had just received a cheque for 10*l.* from his lordship. Mr. PARKER HAGARTY has consented to attend as a visitor-member at the meetings of the life-class held twice a week at the Society's room.

THE Exhibition of the Royal Society of British Artists is essentially a quiet one—quiet in colours, in subject, and in price. A great many pictures are purchasable at five guineas apiece. The large room is so subdued in appearance that a figure in a reddish-orange robe, *Rappaccini's Daughter*, becomes quite startling. But it must be said that if occasionally there are weak works, there is nothing pretentious. The Society is in a transition state, and allowance must therefore be made if the Exhibition is not equal to some which preceded it. Mr. WYKE BAYLISS, the president, is as scenic as ever in his pictures of architecture. Amiens Cathedral is seen with a procession passing through it; Lierre Cathedral and the Sacristy are as good as any of the painter's works. The President of the Royal Academy shows his friendliness by sending an exquisite profile of a blonde girl, which, although small in size, is a treasure; also some sketches from Rhodes, which are as characteristic as larger works, and a small sketch in blue and white of the *Daphnephoria*. Mr. GEORGE RICHMOND has a drawing of the Irish Secretary, who, evidently posed for the occasion, and appears to make eyes at the spectator. Mr. WATTS's *Ganymede*—a young child with a sad expression holding a cup and grapes—might readily pass for an "old master." Mr. DOBSON has one of his girls' heads with the title *On the Balcony*. Sir JOHN GILBERT's *Landscape Evening* is one of those bravura sketches which are familiar and seem repetitions. There are several pictures by the ordinary members which deserve to be noticed on another occasion.

THE vacancies in the French Academy of Fine Arts have been filled up. On Saturday last M. GUSTAVE MOREAU was elected as successor to the late GUSTAVE BOULANGER. The new academician is an artist who is a perpetual puzzle to the critics. Early works like the *Delivery of Athenians to the Minotaur* are plain to everybody, but afterwards M. GUSTAVE MOREAU appeared to take a suggestion from the English pre-Raphaelites. He looked at Classic scenes through Mediaevalism. He made his pictures most brilliant in colour because they seemed to be made up of an infinite number of spangles, and his figures had an air of mystery and mysticism that confounded the Parisian sightseer. His style may be called original, and it is certainly unique. The academicians did well to recognise the spirit of a man who could not fail to be misunderstood. GUSTAVE BOULANGER's professorship, which means headship of a national atelier, passes to M. BONNAT. He is best known as a portraitist, but he is a splendid draughtsman, and the student is to be pitied who enters his classes and is weak in his contours or washy in his colouring.

M. BLANCHARD, the engraver, who has been elected to succeed M. FRANÇOIS as a member of the Académie des Beaux-Arts, is known in England by his plates after Mr. FRITH's *Derby Day* and *Marriage of the Princess Royal*. He was born in 1819, and was a pupil of his father. Among his most popular engravings are *Christ the Consoler*, and *Faust and Marguerite* after ARY SCHEFFER, *The Repose in Egypt* after BOUCHOT, the *Smokers* and *Chess Players* after M. MEISSONIER. M. BLANCHARD obtained eighteen votes against fourteen for M. WALTNER.

MR. A. MARSHALL read a paper on "Old Carved Furniture and Woodwork" before the Leeds and Yorkshire Architectural Society. He remarked that an architect's duties were supposed to be confined to plans and designs for buildings, but he recognised that it was equally within the scope of the architectural profession to guide public taste as to the best style of furnishing and decoration. Alluding to chests, he said that they were of early origin, and were very important pieces of furniture with our ancestors. The early examples of the thirteenth century were somewhat rude, and had few pretensions to architectural beauty. In the fourteenth and fifteenth centuries they became more ornamental, and in some of our village churches there still existed some magnificent examples of chests of the fifteenth century. The lecturer then referred to wainscoting and panelling, and noticed different varieties of chairs, and the introduction of carved chairs into England. He described various types of cabinets, Court cupboards, tables, doors, fireplaces, and beds in use in the sixteenth and seventeenth centuries; and as to the adaptability of the old furniture to modern requirements, he said that in these practical times, when economy was one of the first considerations, no furniture was more capable of standing the wear and tear of our everyday business life than the quaint, stolid work of the seventeenth century.

THE French architects who expected to take part in a competition for the new Opéra Comique seem to be doomed to disappointment. We stated last week that an opponent to the competition was found in the Minister of Fine Arts, who backed a design made by one of his officials. A much stronger sort of opposition has arisen. On Saturday last the report of M. STEENACKERS, as chairman of the Special Commission on the project, demanding 30,000 francs for the expenses of the competition, came before the Parliamentary Budget Commission. The latter body declined to consider the application, on the ground that the duty of the Special Commission was confined to the approval or rejection of the official design, and did not comprise a right to apply for money. M. LOCKROY, the Minister, professed a desire to be rid of the affair, and the Budget Committee, therefore, while declining to recognise the demand, sent a query to the Chambers, to ask if granting the 30,000 francs would cause a deficiency in the Budget to that amount. It is like asking if the Chambers sit on the left side of the river. Of course the reply must be in the negative, and, unless some new dodge is discovered, there is an end to the competition.



### THE WORKS DEPARTMENT OF THE LONDON SCHOOL BOARD.

**A**MONG the legacies which were bequeathed by the members of the London School Board to their successors is a report on the defects of the Works Department. We suppose the new Board's right to that interesting document cannot be disputed, but many will say it would be turned to better account if it came into the possession of a different sort of legatees. If Lord HERSCHELL and his fellow Commissioners obtained the report, and were endowed with powers to utilise it—that is, of course, assuming that the charges could be brought home to particular persons—something more would be done towards promoting honesty in the government of the metropolis, especially as his lordship could hardly fail to transmit the report to the Director of Public Prosecutions, with a request that steps should be taken to enable certain shrewd people to obtain their deserts. If, finally, the report turned up in the Old Bailey, and was employed as evidence, the taxpayers of the metropolis might be excused if they appeared to be glad. If some became sceptical about the advantages of our system of local government nobody would blame them.

The report of the Commission on the Metropolitan Board of Works revealed that the members were ignorant of transactions which were in progress within a few feet of the rooms where they deliberated. A still worse state of affairs existed in the business of the London School Board. The relative value of the sums which were involved in the two departments cannot be stated, for nobody seems able to tell how much was added to the taxation through the way in which business was conducted in Spring Gardens and on the Embankment; but leaving money out of the case, there is no doubt that the practices in the School Board administration were more dangerous to the community. As we shall see, there was a sort of machinery for mischief which was absent from the transactions of the Metropolitan Board of Works, or at least from those of which we have knowledge.

The report with which we are about to deal comes from "the Special Committee on the Work of the Works Department," that was appointed in October 1887, "to report upon the whole of the existing arrangements relating to the work of the Works Department." To aid in obtaining information the services of Mr. EWAN CHRISTIAN and Mr. T. M. RICKMAN were secured. An inquiry by an independent committee, consisting of gentlemen who were not members of the School Board, would be preferable, especially as it was known that charges of dishonesty were to be raised. We suppose the School Board considered that an obligation rested on them to carry out their powers, and they were competent to punish or dismiss any officer who was found to be a culprit, and to bring an action at law against culprits who cheated, or permitted cheating, in contracts. But a committee, made up of members who knew that in less than a year their term of office was to expire, and who were not certain of re-election, could not forget that they might be held responsible afterwards for statements, and that their successors would hardly instruct the solicitors of the School Board to take up their defence. Hence we have a report about persons that is impersonal. The reader can come to any conclusion he pleases about the particular officer or contractor whose misdeeds are set forth, but it will be at his own risk. He cannot point to the report as his authority, or take it as a safeguard against confounding the innocent with the guilty.

Another reason for the silence about names was probably derived from the conviction of the committee that all the evils were the result of a system which was the Board's creation. Instead of giving commissions to several architects for schools, the Board set up an architectural department. We may give them credit for their efforts to secure economy and improvements in planning schools by that departure from an established procedure; but it was forgotten by the Board that there are limitations to departmental power. It was supposed that something infallible and omnipotent was sure to be created because the Board had a wish of that kind, and could form an official organisation. But where were the men to be found who

were endowed with more hands and eyes, with more productive brains than ordinary mortals, who could be ubiquitous and add hours to the days, for beings so endowed would alone be able to undertake the unparalleled task of the London School Board? It is now found that the expectations of the creators of the architectural department are not to be realised, and the report of the Special Committee might be considered as a wail over its failure.

As a rule, all branches of a public office in this country uphold each other, and it may therefore be well if we give some instances to suggest the relations between the School Board and the officials, which were certainly of a peculiarly independent kind. We may premise that the committee admit that in every one of the alleged cases of defective building which were investigated, "some defects and omissions which ought not to have been passed have been found to exist." What is the first reason offered for so discreditable a state of affairs? It is the following:—"The resolutions of the Works Committee, regulating the procedure in reference to school buildings, have been practically inoperative, and have been allowed to fall into abeyance"! Some examples of the disregard of the Board's regulations are mentioned. It was ordered that every clerk of works should keep a diary, in which, among other information, were to be kept an account of daywork in connection with extras and measurements of extra foundations; the diary was to be returned to the architect on the completion of the work, and to become the property of the Board. To what extent was so prudent an arrangement carried out? The committee say they have ascertained "that these regulations fell almost immediately into practical abeyance." There was a special inspector appointed who was to keep the clerks of works up to their duties, and who was himself under an obligation to send in fortnightly reports on all the schools he visited. But, as far as the committee are aware, the reporting inspector's reports were never made, and, indeed, the investigation was "embarrassed by the absence of many of the original documents relating to the construction of the schools which ought to be in the possession of the Board." With such a supervision and so much negligence about records, the committee say it is not surprising that abuses crept into the execution of the works, but, apparently, there was no necessity to creep. Meanwhile the Works Committee, like good, easy men, "were acting under the impression that their resolutions were being strictly observed, and upon no occasion does it appear that their attention was called to the non-performance of those duties." But in business which involved so much expenditure the Board might surely be regardless of a circumlocutory etiquette, and take the initiative. A few questions would have saved thousands of pounds.

A builder who intends to act dishonestly will, of course, try to omit much of his work in foundations. The School Board appear to have had a misgiving that they were cheated in that way, for in January 1879 there is a record "that the architect undertook to be present himself in future when the foundations were dug out, to see all 'bottoms.'" But the committee having discovered that where the questionable foundations could be examined, they were either not carried down to the depth that was paid for, or that the concrete rested on an insecure "bottom," or was not of the required thickness, and having also ascertained that no evidence is forthcoming of the architect having informed the Works Committee of his inability to see the "bottoms" himself, the Special Committee express their difficulty to understand the state of the foundations, unless on the assumption "of collusion or fraud on the part of some of the persons concerned, which the architect did not discover."

It is also stated that instructions for alterations were given by the architect or the inspector of clerks of works, who appears to have assumed the powers of the architect, and, in many cases, no proper order was given until after the work had been put in hand or finished. The report adds, "Of these things, also, the Works Committee do not appear to have been informed. The Special Committee believe that the serious irregularities to which they have called attention, and from which the Board have suffered loss, are mainly traceable to the manner in which the resolutions of the Works Committee were practically violated by those who ought to observe them, or ought, if they found it impossible



to have observed them, to have reported the fact to the Works Committee."

The Board must take the responsibility for the organisation of the architectural department and its shortcomings, as it would be absurd to expect the officers to do more than is practicable elsewhere. When, for instance, it is said "that there were not a sufficient number of clerks of the works employed to efficiently superintend the erection of new buildings," the deficiency was solely a Board's or Finance Committee's question. What is the use of an architectural department if it cannot be conducted cheaply, and there is generally a tendency in architecture to have a special standard for the expense? The search after economy at all hazards is seen in the history of the official measurer. It was believed that one man could measure up all additions, variations, and omissions of contracts, settle final accounts, furnish estimates for all provisional amounts demanded, and other work of quantity surveyors for the sum of 300*l.* a year. It was afterwards discovered that one man could not do surveyors' work for so many schools as were then in progress, and the old arrangements had to be renewed. It was also necessary to prepare plans of schools with an expedition that was without precedent. When therefore it is reported that sometimes quantities for a new school had to be taken out before the plans were completed, with the aid of plans of a similar school, and also that a serious proportion of a tender was for provisional quantities and amounts, all that laxity was due to the circumstances of the time, although another cause may now be ascribed. The head of an office is bound to recognise economy, and when it is charged that there is no evidence of measures being proposed to remedy the imperfect supervision and the undue pressure of work, it would be absurd to suppose that the omission is due to negligence. No man would abstain from getting help if he knew it could be obtained.

The weakness of the architectural department could not, however, be concealed, and unfortunately men were to be found who were ready to take advantage of it. The Investigating Committee now lay down the maxim that "the best security for good work is to be found in the employment of good builders," which seems like a repetition of advice that was given by Mr. CHRISTIAN or Mr. RICKMAN. But the Board's conditions were not always attractive to the good builders, even if men of that class got a chance. The course adopted up to 1883 for the discovery of builders was not revealed to the Investigating Committee. The report says "there is no evidence which shows upon what principle or by whom these selections were authoritatively made." When the system of open competition was introduced it was not to be believed that all the defects of the former way of dealing with builders were removed, and the committee have to acknowledge that the effort which was made to secure a higher class of contractors turned out a failure. It is also admitted that there were "circumstances" in the Board's system which could be turned to account by builders if they were "deficient alike in experience of sound work, in the requisite capital, and legitimate habits of business." The circumstances were the absence of efficient supervision, the disproportion of the sum which was withheld as retention-money, the elasticity of conditions of contract. In other words, the arrangements of the architectural department should have been very different in character.

With an insufficiency of clerks of works, it was no doubt believed that there must be a check against bad work by keeping back 20 per cent. of the contract amount for six months after the completion of the contract. In practice the action was made more endurable, but builders with capital hesitated about accepting contracts which made them liable to so large a retention. Men who traded with capital that was not their own were less timorous, and, as they also obtained materials on credit, they could not insist on getting the same quality as was obtainable by builders who were able to pay on delivery. It seems hardly credible, but the report states that the standard of quality as defined in the specification was allowed to be departed from and something else substituted, on the assumption "that it was as good as the Board could get for the money." A theory of that kind would be taken as an invitation to deviate from the contract deed, and who can wonder when he reads the

committee's statement that "it is certain that both from imperfect material and imperfect workmanship the Board have suffered serious loss"? It is considered probable that the builders when tendering reckoned upon variations of the conditions of contract to a considerable extent, but it is now difficult to know how far the reckonings were correct. All the committee can say is that in many schools the amount of repairs is already "abnormally large," and there is, moreover, a possibility of the expenditure for repairs becoming a very serious item in the future.

Some people may ask if there is not a remedy against the builders for their defects and omissions, the latter meaning work that was paid for but never executed. If there were no limitations of time, it would be waste of money to undertake an action to recover either the payments that are not to be accounted for, or damages for the inconvenience caused by defective work. The reason is that the usual practice was departed from both within doors and with out. According to the report, "detailed accounts do not appear at any time to have been presented to the Works Committee"; their substitutes were abstracts which were practically worthless as means of investigation of the outlay. The Works Committee passed the documents, which represented so much money, "as a matter of routine," and the Finance Committee paid the money also as a matter of routine. All the Investigating Committee can now say for the consolation of the inhabitants of the metropolis is "that it is very doubtful whether the Board can recover from the builder any loss to which they may have been subjected, either from improper charges in the settlement of the accounts, or from any species of neglect in the execution of the work." It is also charged that accounts were sometimes prepared in a way that would largely increase the commission of the quantity surveyor, but in cases of that kind we suppose there is also no use in invoking the aid of the law.

The Board can, however, adopt a course which, if it cannot make up some of the losses, will at least prevent honest men from being made to suffer from prejudice. The course we recommend is the publication of the names of the officials and builders who are in any way connected with the irregularities and discrepancies, or what Mr. RICKMAN describes as "defects and omissions which ought not to have passed, and which are not allowed for in accounts." It is difficult after reading the report to believe that any of the builders who obtained a contract from the School Board could be honest, for although certain schools are mentioned, no one can suppose that the irregularities were confined to them. Now, we cannot believe that all the builders conducted their work without any regard for honesty, and even among those who were not large capitalists there must have been some who were above temptation. Yet they are likely to suffer because they were builders to the Board. The same grievance falls on the quantity surveyors and other members of the staff, who performed their duty in a rightful way. Indeed, the public may draw a conclusion from the report that nobody who takes a part in the designing, measuring, or inspecting of buildings is to be trusted, and on that account we must press for further action by the new School Board. Silence is often golden; but the world is not to be reformed if men who act wrongly are treated as if they resemble unknown quantities. The School Board should also give a chance to the officials to offer explanations about the charges which are raised against them. Credit is given to the Works Committee for their direction, which brought about improvements in planning and designing schools; but if they take the praise, the committee should take the blame for what looks like an indifference to duties which were laborious.

If the Board will be contented with allowing the report to remain in its present state, there is nothing to prevent the builders from taking action, if they consider that the statements will in any way cause architects and the public to believe that connection with the Board schools is not a guarantee of fair dealing. The metropolitan builders and their societies should try to obtain more definiteness in the statements, or at least an acknowledgment that builders who may claim that they were faithful to specifications and conditions are not mixed up with the allegations.



## ART AS A PROFESSION.

AN address was delivered by Mr. John Lovell before he distributed the prizes to the students of the Liverpool School of Art. Mr. Lovell said that as a journalist who had had some little experience on the outskirts of a kindred art—literature—he might perhaps be able to say a few words that would not be considered entirely out of place concerning the spirit and temper in which an art career should be undertaken; and as one whose business it had been for more years than he cared to count up to observe closely what went on in the great world around him, he might also be able to say something to the purpose concerning the prospect which opened itself out to those who were about to adopt art as their profession in life. The first of these subjects—the spirit and temper in which an art career should be undertaken—was one which might be viewed from two different standpoints: that of the artist in relation to his work, and that of the artist in relation to the public, to whom he must look for recognition and support. Let them, to begin with, take the standpoint of the artist in relation to his work. There was, he supposed, no dictum of the ancients which had been more universally or more frequently quoted than that in which Horace, in his “Art of Poetry,” says that the poet is born, not made; and he was afraid he must add that there was probably no dictum of any great writer of any age which—quite contrary to the meaning and intention of its author—had done more mischief in the world of art. It had been interpreted too literally. It had been too widely applied. Not merely in poetry, but in all the arts it had been made the excuse for a reliance upon gifts and a neglect of cultivation which had strewn the shores of human achievement with the wreckage of great minds that might otherwise, with the help of industry and perseverance, have been brought fully-freighted into port. That the artist must be born—that, in other words, he must be endowed by nature with the special faculties that fit him for his high calling—was most true; and in that sense the artist could not be made, for unless the special faculties are there to begin with no amount of cultivation would produce them. But to say that, given the existence of the special faculties, no after process of making was required was so obviously untrue that nobody in his senses was likely to be deceived by it. Unfortunately, however, the proposition very rarely presented itself in this naked and repellent form. It came in its most insidious guise when it whispered into the charmed ear of an exceptionally clever student that, inasmuch as he was more highly gifted than the majority of his fellow-students, and could do with ease what they could only do with difficulty, there was not the same need for him as for them to plod and strive and weary himself with the drudgery of persistent training and discipline. When it was so applied, the Horatian dictum became one of those half-truths which, according to a modern poet, were “ever the blackest of lies.” The whole truth was not only that the born artist must be afterwards made, but that the richer the quality and the finer the texture of his mind, the more intricate and delicate would be the necessary process of making. And they might depend upon it that no more ruinous heresy could lay hold upon the mind of the art student than that which told him that gifts were in any degree a substitute for labour. And by cultivation he did not merely mean training in the technique of the art one had chosen to follow; nor study, however diligent, of the methods of the greatest masters in that art; nor even the drinking in of great fresh draughts from the fountain head of nature herself. These were all means of the first importance in reaching forward towards perfection, and might on no account be neglected. But the cultivation he meant included more than this, and took a wider range. It was that cultivation which sought to expand and fertilise the mind, not in one direction only, but as a whole—that cultivation which, recognising the sisterhood of all the arts and their helpfulness to each other, sought to lay as many of them as possible under contribution for the benefit of the one to be enriched. It was by the gathering together of ideas from every available source, by the correlation of those ideas, and by the contact which takes place among them during the process, that new ideas were engendered, and men became original. Other things being equal, it was always out of the fullest mind that the best art work came. And this was why the labour of the artist should ever be in proportion to his gifts; for the more far reaching and comprehensive the grasp, the larger was the quantity, the greater the variety, and the finer was the quality of the materials which it demanded for its purpose. Turning to the second standpoint from which he proposed to view the spirit and temper in which an art career should be undertaken—that of the artist in relation to the public, to whom he must look for recognition and support—the lecturer said that to begin with he thought he was correct in saying that every exceptional gift carried with it a corresponding weakness, and was beset by its own special form of temptation. Now, it seemed to him that the vulnerable

spot—if there be one—in the highly-strung artistic temperament was its extreme sensitiveness, and unless this spot was plated over with thick armour the young artist stood in some danger of being wounded to the death by the very breath of public opinion, on which he should live. It was no doubt calculated to demoralise the strongest artistic mind to find that the subtle beauties and the more recondite excellences of the work which is produced, were by ordinary people ignored or misunderstood. Certain it was that for an artist to allow himself to be chafed and fretted by the vagaries of a not duly appreciative public was to play straight into the hands of that which he had ventured to call the besetting temptation of the artistic temperament. That temptation, as it seemed to him, ran in the direction not so much of overrating the faculties to which they were indebted for a sense of the beautiful, as in underrating the faculties upon which they had to depend for their supplies of the useful. That way of thinking, indulged in to excess, generally ended in making him a member of some little clique of mutual admirationists, or in relegating him to the wilds of Bohemia. But there was no need to carry consequences out to this extreme limit. The mischief began earlier. To cultivate a habit of regarding that which he would call the practical business intellect of the world, as being necessarily inferior to the intellect that was capable of devoting itself to art, was to set up antipathies between the artist and his public which could not but have the effect of driving further and further apart those who in their own best interests should ever be striving to bring themselves into closer contact. A far healthier outlook upon life for the art student was to regard each type of mind as having its appointed place in the human economy, and as being specially equipped by an equal hand for the particular kind of work which fell to its lot. Or—which was better still—let him apply to the rest of mankind a standard which he would do well to apply to himself, namely, that of judging men not by the aptitudes which were bestowed upon them by nature, and for which, therefore, they were neither subject to censure nor entitled to applause, but by the measure in which they utilised those aptitudes for the common welfare. He would then have established a bond of sympathy between himself and his public which would protect him from his own special forms of weakness and temptation, and make him a better, a happier, and a more prosperous man. And now he (the lecturer) would ask what were the rewards of a career which at its outset and all along its course demanded so much patient labour, and was beset with so many difficulties? Or, rather, what was the prospect which opened itself out to those who were about to adopt art as their profession in life? He did not deny that the commercial and industrial circumstances of the past few years had had the effect of restricting the gains and diminishing the fortunes of the class upon which in the past artists have mainly depended for support. Nor did he deny that painters who had insisted upon adhering to the old ways had severely suffered in pocket thereby. But he certainly did deny that the one misfortune was the necessary consequence of the other; and he ventured to affirm that, for the painter who was able to read the signs of the times, and was willing to adapt himself to the changes which were going on in our midst, there never was a brighter outlook or one more full of promise than there was at the present moment. They must briefly consider, then, what was the nature of these changes, upon which so much depended. First, it was one of the peculiarities which distinguished the present from all former periods of depression in trade, that the same causes which had led to a decrease in the wealth of the rich had brought about an increase in the wealth of men of moderate and even of small means. Secondly, side by side with this remarkable transfer of wealth from a smaller to a larger section of the community, education had, by multitudinous agencies, been dipping deeper and deeper, and spreading more and more widely among the lower strata of the population. Thirdly, there were none of those educational agencies which had displayed greater activity or shown more palpable results than the Government schools of art, of which that was one. Lastly, the methods by which works of art were reproduced and multiplied, had increased a thousandfold. Now, what must be the necessary result of all these changes from an art point of view? Was it not that where the patronage of the few had broken down, the many had come to the rescue? Was it not that where the painter failed to find a purchaser in his old market, he could turn to the new market, and find not only an equally liberal patron, but an infinitely wider field of fame? He granted that for the painter who would not allow his work to be translated into black and white there was a very poor outlook indeed; but for him who chose to avail himself of the reproductive processes of the day there never was a better prospect. Time was when art, held at arm's length by the industries which ministered to the comforts as distinguished from the luxuries of life, could scarcely find an entrance to the homes of the people. Now she took her stand in almost every workshop, and brightened by her presence the humblest home in the land. In no department of our industrial activities, perhaps, were the results of this enormous change more visible



than they were in that which connected itself with the printing press; nor was there any time of the year in which those results were brought out so prominently as they were at the present season. It was not for him to enlarge upon the beauty and variety of the innumerable works of art which as Christmas came round were scattered broadcast throughout the country. His purpose was to point out that behind every illustrated gift book, behind every presentation plate, behind every Christmas card, there stood an artist. That being so, he would ask those present, in conclusion, to adequately realise this stupendously significant fact—that the patronage of art was no longer the exclusive prerogative of the upper ten thousand, but had passed to the nation—aye, to the empire at large. They would then be able to clearly foresee that as years rolled on, and as education dipped deeper and spread more widely, and as fresh relays of students continually went forth from these schools of art to lift the multitude into a higher region of appreciation and delight, an ever-broadening prospect of remuneration and fame opened itself out to those who adopted art as their profession in life.

### ART AND CULTURE.

IN the course of an address which he delivered in Leeds last week, Sir John Lubbock said:—

It is not only in the East that great works, really due to study and labour, are attributed to magic. This is as true of art as of science. "When we read the lives of the eminent painters," says Sir Joshua Reynolds, "every page informs us that no part of their time was spent in dissipation. Even an increase of fame served only to augment their industry. The pictures thus wrought with such pains now appear like the effect of enchantment, and as if some mighty genius had struck them off at a blow." Nothing, in fact, is denied to well-directed labour; nothing is to be obtained without it. But alluding to this in a subsequent discourse, he adds, "The industry which I principally recommended is not the industry of the hands, but of the mind." Science and art are sisters. The mission of art is in some respects like that of woman. It is not hers so much to do the hard toil and moil of the world as to surround it with a halo of beauty; to convert work into pleasure. In science we naturally expect progress, but in art the case is not so clear; and yet Sir Joshua Reynolds did not hesitate to express his conviction that "so much will painting improve that the best we can now achieve will appear like the work of children." The appreciation of nature, which characterises the present century, the intense love of scenery, to which we owe so much, which not only adds so much to the happiness, but even, I venture to think, to the purity of life, we owe in no small degree to art. May we not hope in this respect also still further progress may be made; that beauties may be revealed, and pleasures may be in store for those who come after us, which we cannot appreciate, or at least can but faintly feel? And yet even in art the appreciation of landscape is but recent. It is remarkable that while artists have long recognised the necessity of studying anatomy, and there has been from the commencement a professor of anatomy in the Royal Academy, it is only of late years that any knowledge of botany or geology has been considered desirable, and even now their importance is by no means generally recognised. I have, of course, no pretension to speak of art, but even in the case of the greatest masters before Turner, the landscapes seem singularly inferior to the figures. Sir Joshua Reynolds tells us that Gainsborough framed a kind of model of a landscape on his table, composed of broken stones, dried herbs, and pieces of looking-glass, which he magnified and improved into rocks, trees, and water, and Sir Joshua solemnly discusses the wisdom of such a proceeding. "How far it may be useful in giving hints," he says, "the professors of landscape can best determine," but he does not recommend it, and is disposed to think, on the whole, the practice may be more likely to do harm than good. In the picture of *Ceyx and Alycone*, by Wilson, of whom Cunningham said that with Gainsborough he laid the foundation of our school of landscape, the castle is said to have been painted from a pot of porter, and the rock from a Stilton cheese. There is, indeed, another version of the story—that the picture was sold for a pot of porter and a cheese, which, however, does not give a higher idea of the appreciation of the art of landscape at that date. This want of appreciation of the beauty of scenery is also apparent in literature. Ancient literature contains few references to scenery. Mountains are referred to only as objects of horror, and there are so few mentions of colour, either, for instance, of sea or sky, that some have even been led to imagine that the ancients must have been colour-blind, or at any rate incapable of seeing the certain colours as we do now. Our minds might have been constituted exactly as they are, we might have been capable of comprehending the highest and sublimest truths, and yet but for a small organ in the head and the world of sound would have been shut out from us—we should lose the sounds of nature, the charms of

music, the conversation of friends, and have been condemned to perpetual silence; and yet a slight alteration in the retina, no thicker than a sheet of paper, no larger than a finger-nail, and we should lose the glorious spectacle of this beautiful world, the exquisite variety of form, the play of colour, the variety of scenery, of woods and fields and lakes and hills, seas and mountains, the glory of the sky alike by day and night. Art has the power of bringing together the most beautiful scenes from distances both of time and space. They not only endow us with wings, which may transport us without effort, suffering, or loss of time on our part from our own country to the most distant regions of the globe, and bring before us, one after another, London, Rome, Athens, Constantinople, Cairo, Benares, Peking, or Yokohama; the ocean in all its varied moods, the fields and woods and rivers of England, the lakes and mountains and glaciers of Switzerland, the prairies of America, the deserts of Africa and Arabia, the snows of winter and the sunshine of summer; but they can transport us back through centuries in a moment, and bring vividly before us the greatest personages and most interesting scenes and events in history.

### TESSERÆ.

#### The Roman Cavaedium and Peristylum.

W. RAMSAY.

AS houses became more spacious and the dimensions of the atrium were increased, it became necessary to support the roof with pillars, one being placed at each corner of the impluvium. In process of time a room was found to possess many advantages in point of coolness and ventilation in which the aperture was made larger than was absolutely required for the admission of light; more pillars were in this case required for the support of the beams, and a small open court was then formed below the impluvium, surrounded by a colonnade. An apartment formed upon this plan was termed a cavaedium. When the size of this court was considerably enlarged, so as to leave merely covered cloisters between the pillars of the colonnade and the walls, the court and cloisters were termed peristylum. Houses on a great scale had an atrium, a cavaedium, and a peristylum, all spacious, but occasionally the atrium was contracted to a mere ante-chamber, and the cavaedium became the great reception hall. When this was the case, the atrium was sometimes roofed over completely (*atrium testudinatum*), receiving light from the cavaedium on one side and from the outer door on the other. It is clear that it must have been difficult to determine the exact point at which an atrium passed into a cavaedium, and a cavaedium into a peristylum, and it is not surprising that the expressions employed by ancient writers on these matters should be occasionally ambiguous. It is quite unnecessary to enter upon the details of the controversy maintained by those upon the one hand who maintain that atrium and cavaedium are absolutely synonymous, or at all events, that the cavaedium was merely the small court in the centre of the atrium, and by those who insist that these words always represent apartment entirely distinct. It is enough to bear in mind that the atrium was never dispensed with, that neither the cavaedium nor the peristylum was essential, and that when we find one only in may be difficult to determine to which of the classes it properly belongs.

#### Destruction of Roman Temples.

C. MERIVALE.

It is impossible but that, in the decline of Paganism, these sacred buildings must have suffered from neglect, even before the churches of Christianity rose to supplant them. Neither Constantine nor his immediate successor ventured to close them. Theodosius, who destroyed the temples at Alexandria, still spared those of the Pagan metropolis. But the violence of the Christians grew with their strength. In 399 the edict of Honorius suspended all the temple services; and the clause which forbade any outrages to be committed on the buildings themselves seems to show not only that such were to be apprehended, but that they had been already offered. Augustine boasts in one place that all the statues in Roman temples had been demolished; but he speaks elsewhere of temples and sacred groves being appropriated to Christian worship, and sanctified thereby; and we must suspect Jerome of his usual exaggeration where he exults in the general ruin which, as he asserts, had fallen upon the sacred places of the heathen. At all events, there is no more brilliant description of the Pagan shrines of Rome than that of Claudian, himself a Pagan, at the very epoch to which we are now referring. At last, in 426, the younger Theodosius issued an edict for their destruction, and this edict is generally supposed to have been carried out pretty completely. It is said that from this era we meet with no reference to the temples in the imperial legislation; but this, indeed, was hardly to have been expected when the temples



had ceased to be public property or objects of public interest. It is not strictly that from henceforth there is no mention of them in the narrative of political events. Procopius, in the sixth century, alludes to the Temple of Peace as then existing, with other similar monuments, and particularly describes the form, the dimensions, and the material of the Temple of Janus. The populace, he says, Christians though they nominally were, attempted to open the gates of this temple as a protection against an advancing enemy; a trait of superstition which shows that they still retained a lurking respect for the ideas of antiquity, and would have revolted against any indiscriminate attack upon their monuments and emblems. If, however, these venerable edifices escaped a general proscription and demolition, they fell for the most part by a more lingering process, being despoiled from time to time by the cupidity or caprice of the private owners into whose hands they came. Thus, in the reign of Justinian, a Roman matron, the proprietor of a ruined temple on the Quirinal, presented eight of its columns to the emperor for the decoration of St. Sophia. Vast numbers of columns, friezes, and entablatures were thus transferred to Christian churches. The application of the temples themselves to ecclesiastical uses was more rare, and is believed to have begun rather later. The Pantheon had escaped destruction or serious mutilation down to the seventeenth century; it was converted into a church in the year 604, in which year the gilded tiles of the temple of Venus and Roma were also transferred to the roof of St. Peter's basilica. We know, however, of four or five only of the ancient temples which were equally fortunate with the Pantheon; those, namely, which were dedicated to SS. Cosmas and Damianus, to St. Stephen, St. Hadrian, and that of Vesta or Romulus, which has assumed the name of St. Theodore. On the other hand, we read of not less than fifty-six churches erected on the sites of temples either previously destroyed or actually pulled down for the purpose.

#### Contrast of Colours in Nature.

W. BARNES.

Nature is very sparing of showy contrasts of warm and cold colours. Red and blue are very rare, and of yellow and blue the cases are but few, and black and blue are found in lepidoptera more often than white and blue are seen in our flora or fauna. It is not uncommon for one of two strong colours to be overcast with a tinge of its fellow, or for both of them to be reconciled by a common touch of black, or of some third colour, or of one of them to be lightened by a dash of white, while the other is lowered by as much black, and so red, offhued with black—russet and green upbrightened with white—often meet in the autumn in dead and dying patches of fading leaves. It may be shown, I believe, by the refractions of light in crystallised gypsum that brown is the complementary colour to lavender-grey; and how true to herself is nature, we may go forth and see, in the fall of year, in the dead and curled leaves of the mugwort, or meadow sweet, which are beautiful even in their death, with one side brown, and the other the brown-matching grey; and, if brambles be cut in the leaf-green season, their two surfaces soon wither into the harmony of grey and brown. And what use are we to make of these hues of nature? They are warrants for a grey mantle under locks of brown hair, or a brown bonnet or trimmings, or a grey room wall with brown furniture; and if, in a hot summer's day, I see the dark leaf-shades playing on the grey bark of a young beech, I can boldly lay darkish leaf shapes on a wall of the beech-bark's hue; or if, after the winter rains, I find a barkless pole in railings, tinted with the palest blue-grey, and on breaking off a splinter of it I find its inner wood of its true colour of pale brown-yellow, why should I not take the inner tint for my wall and the outer one for the skirting? Or, if I pick up a piece of lichen of dull green on one side and dull grey on the other, why should I not bind my book in one colour and lay on it a lettering-piece of the other? Nature is the best school of art, and of schools of art among men those are the best that are nature's best interpreters.

#### The Quattrocentisti.

M. GRUYER.

The Italians have furnished us with the word *quattrocentisti*, which is now commonly employed in the language of the arts, and we ought, therefore, to realise what it means. Literally the *quattrocentisti* were the artists who lived between the years 1400 and 1500, or in other words the artists of the fifteenth century. If so rigorous an explanation is demanded the word is without sense. If we call all the artists who were born before 1500 *quattrocentisti*, then Leonardo da Vinci, Michel Angelo, Titian, Raphael, Andrea del Sarto and Correggio are *quattrocentisti* equally with Luca Signorelli, Sandro Botticelli, Domenico Ghirlandajo, Filippino Lippi, the Bellini and Mantegna. The confusion thus becomes evident, and we must conclude that the word *quattrocentisti* should not be employed if it must be subordinated to dates. What it

expresses is an idea without any definite relation to time. The *quattrocentisti* are the artists of the fifteenth century, in whose works something primitive is conserved. Filippino Lippi, who was born in 1457, is a *quattrocentista*, whilst Leonardo da Vinci, who was born five years earlier, in 1452, is not one. The *quattrocentisti* are the representatives of a state of art which, although no longer in infancy, is yet in a condition of dependence, and therefore tied down. As for those men of genius who belong to the fifteenth century, but who were strong enough to soar above their age, to wing their way to new horizons and to penetrate into worlds which were supposed to be inaccessible, no matter in what time they were born, or when their works were produced, they cannot be called *quattrocentisti*. Leonardo da Vinci, Michel Angelo, Titian, Raphael, Andrea del Sarto, Correggio, are beyond classification; they are not of an age, but belong to humanity in general.

#### Gibbs as an Architect.

J. ELMES.

Gibbs was an architect of the school of Wren, but effected by laborious detail and superabundance of ornament—as may be seen in his works, particularly in the interior of the church of St. Martin—what Wren accomplished by more simple and scientific means. The exterior of St. Mary-le-Strand is of two Orders in height, which presupposes two storeys to the interior—a fault committed by Jones in his banqueting-house, Whitehall, and by Wren in his St. Paul's Cathedral. The former has for an apology that his building was part and parcel of an enormous palace, and corresponded with such portions of it that had two storeys, and this required the omission of one for height in the interior. For Wren it may be said that his two storeys of coupled columns in the western front have nearly the same proportions of one, and that viewing his cathedral from a distance—the best position for seeing its beauties—the lower is entirely concealed from view by the houses that surround it. The circular portico in the western front of Gibbs's church in the Strand is a palpable and clumsy imitation of Wren's beautiful semi-rotunda to the north and south transepts of St. Paul's. The summit of its cupola was to have been surmounted by a farthingaled statue of Queen Anne. The exterior of St. Martin-in-the-Fields is in a bolder style and purer taste. The columns *in antis*, or, to speak less technically, the columns between the antæ or pilasters, that form the retrocessed porticoes of the north and south aisles, are both novel and effective; and the Corinthian hexastyle portico of the western end would be unexceptionable, were it not for the cumbrous steeple that bears down its apex. No such monstrosity disfigures any of Wren's churches, whose steeples always rise from external and visible towers. The interior looks fine from a redundancy of ornament—divested of which it would degenerate into commonplace. It is, however, a large and commodious edifice, well adapted to the parochial church service of the Establishment, the arrangement of which Chambers did not disdain to imitate in his German Lutheran church in the Savoy, near Waterloo Bridge. Of Gibbs's other work, the Radcliffe Library, Oxford, it can only be called a practical blunder; for devoid of the necessary scientific skill in construction that is requisite to complete the character of an architect, he intended to have executed the cupola with stone, but it would not stand: it was obliged, therefore, to be taken down and to be built of lath and plaster. Gibbs published a treatise on the "Elements of Architecture," which possesses nothing new, and is to be considered more as a student's guide to drawing the five Orders of Italian architecture according to that master's proportions—which are not sufficiently correct to be considered as models—than a treatise on the art of which he aspires to be a teacher.

#### Bronze of the Ancients.

R. WESTMACOTT.

That composition which was so extensively used by the ancients for statues—called by the Greeks "*chalcos*," the Romans "*æs*," and the moderns "*bronze*," from the Italian *bronzo*—is a mixture of copper and tin, with sometimes small portions of other metals. The composition of this material, so extensively used by the artists of antiquity, appears to have been a subject of great care. There were rival schools for its preparation. Pliny especially records those of Ægina and Delos, and says the highest honour was given to that of Delos and the next to the Æginetan bronze. The mere list of names of the different kinds of bronze known to and used by the ancients is curious. Pliny says there was rivalry between two of the greatest sculptors of the best period of the art in the material each employed. Myron used the bronze of Delos, Polyclethus that of Ægina. Besides the bronzes of Delos and Ægina there was the Corinthian; that of Tartessus; then another kind, called the "*æs Demonesium*"; also the "*æs nigrum*" (black), and the "*æs candidum*," or light-coloured, supposed to have had silver in it. There was also a bronze of a liver colour, called "*æs Hepatizon*," which probably resembled the brown or true bronze colour of the cinque-cento works.



There were other modes of working in metal besides casting used by the ancients. Such was the solid and the hollow hammerwork (*sphurelaton*) described by Pliny and others. The earliest metalworks were doubtless produced in this way. There were various modes of exercising this art. Pausanias saw several works of the kind, and explains the different processes. Pliny also furnishes some very curious information upon the subject. Either solid pieces of metal were beaten into shape and fastened together by means of pins or keys; or the metal was beaten out into plates, and then worked into the desired form over a core or nucleus of wood. A small head of *Osiris* in the British Museum exhibits an instance of this practice. The form is bronze, and the centre, of wood, is still remaining. Of entirely solid statues, Pliny mentions an interesting example in the statue of *Diana Anaitis*. Other instances might be quoted, but the above are sufficient to prove the practice. Ancient authors allude to some very remarkable effects produced by the mixture or fusion of metals, by which the complexion of the countenance could be given. Callistratus speaks of a bronze statue of *Cupid*, by Praxiteles, on the countenance of which was a vivid blush. He mentions another, by Lysippus, in which the cheeks were coloured like a rose. Pliny refers to a statue of *Athamas*, sitting overcome with remorse after the murder of his son, and says that the artist, in order to express the effect of shame, had mixed iron with the bronze, which caused, "by its redness shining through the bronze," the appearance of a blush. Pliny does not say he saw this work himself. Plutarch, again, refers to a statue, made by Silanio, of *Jocasta Dying*, and tells us that by a peculiar mixture of the metals used, a cast of paleness was given to the complexion. Too much dependence must not be placed upon these general statements. That the works above referred to, and others that might be mentioned, exhibited colour is likely enough, but that those tints were produced in the way suggested, namely, by the fusion of metals, is next to impossible.

#### The Cathedral of Treves.

SIR F. PALGRAVE.

No one of the Christian Basilicæ at Rome resulted from any adaptation of the civil structures of heathenism to religious purposes. The columns fell, to rise in new localities. Rome furnishes no example of a basilica preserved by its application to Christian worship. No confirmation is given in the ancient capital to the orator's assertions, exulting, in the presence of Gratian, at the crowds which filled the ancient halls of justice, then, as he boasts, resounding with hymn and praise; yet we can point out one city in which his assertions are not a rhetorical phrase, but a truth. Do we seek for the verification of the words of the poet-rhetor—"Basilica, olim negotiis plena, nunc votis pro tua salute susceptis"? At Treves we find that which at Rome we search for in vain. Here alone can we behold the one example of a basilica consecrated as a Christian church, in which you enter, and see the Corinthian capitals displaying their graceful foliage, mutilated and yet distinct, through the rude wall which encircles them, whilst the shaft of another, displaced and broken, lies in gigantic bulk before the portal of the edifice. This, indeed, is the very city in which the poet-rhetor was speaking—for he is Ausonius, and the city is Treves. The ancient capital of the Roman Empire beyond the Alps furnished the model for the structures, which, far more than Rome herself, assisted in the development of Christian architecture. It is indeed a strange fate of Treves, that this secluded city, on the banks of the Moselle, should have been so singularly influential in the destiny of Christianity. Hence proceeded the tribes who, after their long and devious migrations, reached their seat in Asia, where, as Galatians, they were addressed by the Apostle: preserving, even as late as the time of St. Jerome, their institutions, their laws, their language. In such a connection of race—such a continuance of language—such an adherence to national institutions, thus uniting the Galli of Asia with their ancient kinsmen—do we not discover some of the causes which facilitated the very early and very rapid diffusion of Christianity in Gaul? Treves appears as a link between the churches of Polycarp and of Irenæus. Other circumstances exalted her importance in the annals of the Church. At Treves Jerome studied and commented upon the Holy Scripture; at Treves Ambrose was born, amongst the greatest, both by his life and in his teaching, of the Fathers of the West; and this character, which events bestowed upon Augusta Trevirorum, must have greatly enhanced her influence in all matters connected with the Church, and rendered her example more prominent, her testimony more weighty, her precedent more commanding. Three several reconstructions have greatly obscured the vestiges of the Roman basilica which the Empress Helen converted into the present Dom of Treves. That its original scheme was identical with the Basilica of Maxentius at Rome, a vaulted hall supported by piers, is still apparent even to the un instructed eye. In the days of Hincmar (about 882) it yet retained the mosaics and other ornaments bestowed by her piety. But about 1010, one

of the columns having given way, it was partly rebuilt by Archbishop Poppo. The Roman work is less clearly apparent in the present nave, but Roman bricks abound in the western apse and its side walls; and if it were possible, without injury, to excavate the foundations of the cathedral, the Roman substructure would reappear, showing that, like the Ulpian basilica, it possessed a hemicycle, or tribune at either end. This hemicycle, having been retained when the basilica was consecrated to Christianity, gave the peculiarity of form, the double choir, by which the churches, of which the Dom of Treves is the prototype, are distinguished from all other in Christendom. Upon the nature of the vaulting we have already remarked. On the exterior, the architectural arrangement, including the magnificent apsidal gallery, was suggested by the pillars and arches of the circular towers which ornament rather than defend the Porta Nigra, the Roman gateway of Treves. By the slightest overlaying of the pencil, the more perfect of these towers (as seen in the view of Mr. Dawson Turner's interesting "Antiquities of Treves") will acquire, from basement to summit, the general aspect of the Teuton Romanesque apse, as seen in the extreme northern example at Cologne, and the farthest southern, annexed to the church of Pammachius at Rome.

#### The Relation of the Artist to Art.

J. FERGUSSON.

One of the most fundamental rules of art is that sordid minds cannot express elevation, the impure cannot express purity, or the vulgar mind elegance. If we want lofty, pure, and elegant art we must go to minds where those feelings exist, for all arts are the reflex of the individual or the nation practising them, and the improvement must come from within, either from more sedulous cultivation of purity and the higher emotions, or by a more honest and straightforward mode of expression than has hitherto been adopted. On the other hand, we may feel perfectly certain that all that is bad in the individual or the nation will come out in their art, however much they may attempt to disguise it by foreign costumes or plumes borrowed from those who were artists not only in form but in spirit. Art must come from the heart, and can only come from thence.

#### The Windows of Altenberg Abbey.

E. SHARPE.

The most beautiful stained-glass that I ever beheld I saw in the ruined abbey church of a Cistercian monastery in 1832. It was designed, in all probability, just at the time when the severity of the rules of the Order in this respect, as also in others, began to be relaxed. The abbey, of which this church formed a part, was founded in the year 1133 at Altenberg, near Cologne, by Eberhard, Count of Berg, whose descendants rebuilt the abbey church, from the designs and under the superintendence, it is said, of Erwin von Steinbach, the architect of Cologne Cathedral, in the latter part of the thirteenth century. At the dissolution of the monasteries the abbey was converted into a manufactory, and suffered from a fire in 1815, which destroyed the conventual buildings and injured the church; but when I visited it, in 1832, the church, though roofless and in ruins, still retained the whole of its magnificent Geometrical windows, filled with the most elegant stained-glass. The Prussian Government has, I believe, since restored the roof and repaired the church, and, it is to be hoped, has thereby saved the glass. The design of the building, which, from its windows and moulded detail, belongs evidently to the period ascribed to it, bears in every part the impress of its Cistercian origin, simplicity and elegance of design being its chief characteristics. It is lofty and of noble and stately proportions, but entirely devoid of all florid ornamentation, what carved work there is, chiefly in the pier-capitals, having much gracefulness in its composition. It is, however, to the stained-glass of its noble windows that I desire to call the attention of those who are interested in the subject. It is scarcely necessary to say that they contain no "pictures," and no patches of gaudy colour. They consist, in fact, exclusively of designs of foliage, arabesques, and diaperwork of the greatest elegance, and of infinite variety, arranged chiefly in geometrical patterns executed in grisaille and other light colours, and belong in all probability to the latter part of the period in which the church was built—that is to say, to the latter part of the thirteenth and the commencement of the fourteenth century; in other words, to the very best period of Christian art. Of the artistic nature of these designs, and of the admirable manner and material in which they are executed, it is impossible to speak too highly. Of even feminine fairness and gracefulness, they surpass, in my opinion, all the examples of this kind that we have in this country, not excepting the Five Sisters of York; and if, in the matter of stained-glass, it were desired to select works of art that would most fitly typify and represent the purity and simplicity of Anglican worship, I should not hesitate to indicate the windows of Altenberg Abbey Church as the models we should adopt.



## NOTES AND COMMENTS.

IN the International Exhibition of Paris, as in all which preceded it, the British Section is likely to be the first which will be completed. M. GEORGES BERGER has advised the committees of the remaining foreign sections to try and imitate the example set by Great Britain. It appears that the fixing of the machinery from this country can be commenced on New Year's Day, as the building to contain the machines is approaching completion. Between January 1 and February 15 the glass cases for goods must be fixed in their places. The Commission appears to be resolute at present, and we hope there will be no relaxation of the regulations, otherwise the old story of an incomplete Exhibition on the day of opening will be retold. The regulations about admissions are settled. Entrance can be obtained in the daytime on payment of a franc, except in the hours "affectées aux études," when the charge will be two francs. In the evenings two francs will be paid unless on Sundays, when the charge is to be reduced to one franc. The charges for admission to fêtes in the evening will be according to special decisions. Season-tickets will cost one hundred francs, but members of commissions and committees will pay only twenty-six francs. There will be tickets available during a limited time for members of foreign commissions. Every exhibitor is to receive a ticket, but if he should require the aid of stallkeepers or employés, "jetons de service" will be supplied.

THE standard for draughtsmen in the offices of the supervising architect of the Treasury Department and quartermaster-general of the War Department, United States, is very high, and is to be tested by the Civil Service Commission. A two days' examination was held last week in four cities. In the Treasury Office the draughtsman must possess a thorough knowledge of architecture, with the ability to design and construct public buildings, to calculate the strength of materials and structures, and to make detailed drawings, &c. The quartermaster-general's requirements are more modest, as they consist in a knowledge of construction and designing of ordinary dwelling-houses, a knowledge of building material, and ability to prepare working drawings and specifications. Assistant sanitary engineers were also required, with a thorough knowledge of plumbing and capability to make plans for the drainage of large buildings. These conditions denote that a reform is in operation in the public offices of America. We hope the successful candidates will not depend on the whims of politicians for their tenure of office.

STOTHARD'S original drawings have a charm which is not visible in the copies made from them by engravers. Although he made many designs for the illustrations of books, none of his work shows sign of carelessness, and generally there is a grace which was not always found in his larger paintings. The Nottingham Castle Museum is, therefore, fortunate in possessing a large number of STOTHARD'S drawings, which Mr. FELIX JOSEPH presented. He has just added a set of twelve more. These are not the only gifts which came from Mr. JOSEPH'S valuable collection.

THE inquest upon the bodies of the men who were killed by the fall of the new house in Great Titchfield Street, on the 9th inst., was resumed on Wednesday, without adding much to the knowledge of the causes of the accident. The foreman said the soil was gravel, and the foundations were 14 feet 6 inches below the level of the street. There was a bed of concrete 2 feet 2 inches deep. A wall 14 inches thick was carried up from the basement to the street level. The columns were 5½ inches diameter, and rested on York stone 6 inches in thickness. The common complaint in the metropolis reached the coroner's ears, and he asked whether sand and gravel had been removed and rubbish used instead, but the foreman denied the statement. The travelling foreman said he made examinations almost daily, and everything appeared satisfactory on those occasions. The only admissions he made were, that since the accident, he considered the 14-inch wall was too weak, that the brickwork on which the girder rested had given way, and that as the gravel was not even, about a yard and a half had to be removed. Mr. WALTER MILLER, the architect, said he did not see the foundations put in, as he was

away, but the work was done under the superintendence of an assistant. He spent about three or four hours on the works, and had no fear about the stability of the building. A great deal seems to be made about stacking bricks on the ground-floor, weighing 70 or 80 tons. Mr. MILLER said the accident might possibly have happened by the bricks causing the wall to become ruptured, or receive a shock before it was properly set. He admitted that parts of the wall were bonded with half-bricks instead of whole ones, but could not ascribe the accident to that cause. Mr. MILLER maintained that a detached 14-inch wall was fit to carry the columns and superincumbent weight. A chemist testified to the excellence of the mortar. We said at first that the affair is a mystery, and the same word is used by the architect. The inquiry will begin again on Wednesday, but it would be more convenient if there were shorter intervals between the sittings of the coroner.

A NOVELTY of a dramatic kind may appear to be an impossibility in Paris, but one has been introduced by M. HENRI SIGNORET, who is a well-known journalist. His theory is that students of dramatic literature can only be partially informed at the present time. They have no means of judging of the drama of Greece, Rome, India, Spain, or Italy, of Mediaeval passion plays, of the ancient "jeux des pois pilés," of the works of the great contemporaries of SHAKESPEARE in any city of Europe. The students are, however, too limited in number to allow an experiment by a manager in the ordinary way, unless he was ambitious to find himself in a state of bankruptcy. M. SIGNORET, recognising the difficulty, has devised a plan of overcoming it. He has taken the Petit Théâtre of the Salle Vivienne, and there he presents the old plays with stuffed figures instead of the living players. Several writers have come to M. SIGNORET'S aid as translators and readers, and artists have painted the scenes for him and have designed the costumes. Already the "Guardian Vigilante" of CERVANTES, and the "Birds" of ARISTOPHANES, have been played. On Saturday last M. SIGNORET made a more remarkable experiment. This was the production of SHAKESPEARE'S "Tempest," according to a translation of M. MAURICE BOUCHOR. The "machinery" of the play was constructed with care, and the destruction of the King's ship, the strange shapes bringing in and vanishing with the banquet, the spirits in guise of dogs and hounds, and the other tricks of ARIEL were displayed. The theatre is only opened occasionally, and it is exciting much interest. The experiment could be instituted with advantage in other cities.

THE French Minister of Commerce and Industry has nominated M. DE DRAMARD, the president of the Society of Arts of Paris, to be a member of the Organising Committee for the International Congress of Architects, which it is proposed to hold next year in Paris.

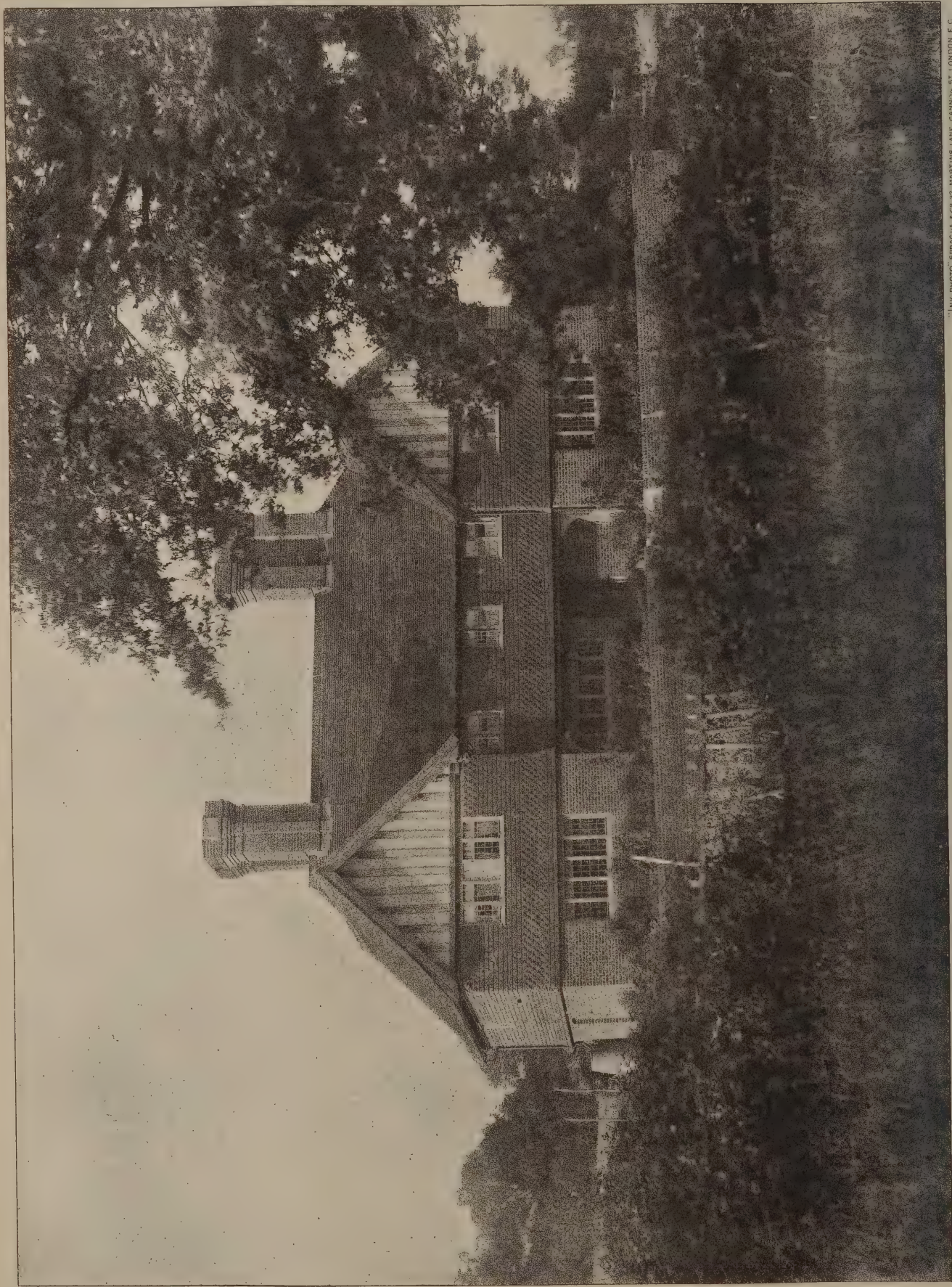
MESSRS. MEASURES BROS. & Co. have brought out their annual series of tables of weights and strengths of girders and columns, sections of beams, diagrams of roofs, sashes, wrought-iron doors, and other information relating to ironwork. Experience has shown the possibility of improving Messrs. MEASURES'S pocket guide, and this year's edition is more portable and more convenient for reference than its predecessors. Although of a very small size and little thicker than an ordinary letter, it is on its subject a book of reference. From the wide experience of the firm, the information can be taken as trustworthy.

A POSTERN-GATE in the outer wall of Edinburgh Castle, which was built up several years ago, is supposed to mark the spot where the parting between CLAVERHOUSE and the Duke of GORDON took place. The War Department having sanctioned the removal of the masonry which fills the opening, the work is now in progress, under the direction of Colonel MALCOLM, R.E. Iron bars will be introduced, in order to suggest the original appearance of the postern. The following inscription will be placed over the gate:—"At this postern JOHN GRAHAM of CLAVERHOUSE, Viscount DUNDEE, held a final interview with the Duke of GORDON, Governor of Edinburgh Castle, after quitting the Convention of Estates.—18th March, 1689."









COTTAGES, FLISHINGHURST, KENT.

M. E. MACARTNEY, B.A. Architect.









DRAINING M

by JOHN  
From the Drawing I



pl 31 1888.



1/4 PHOTO. SPRING LANE. CANNON ST. LONDON, E.C.

L, LINCOLNSHIRE.  
WELL COTMAN.  
Hanging to James Reeve Esq













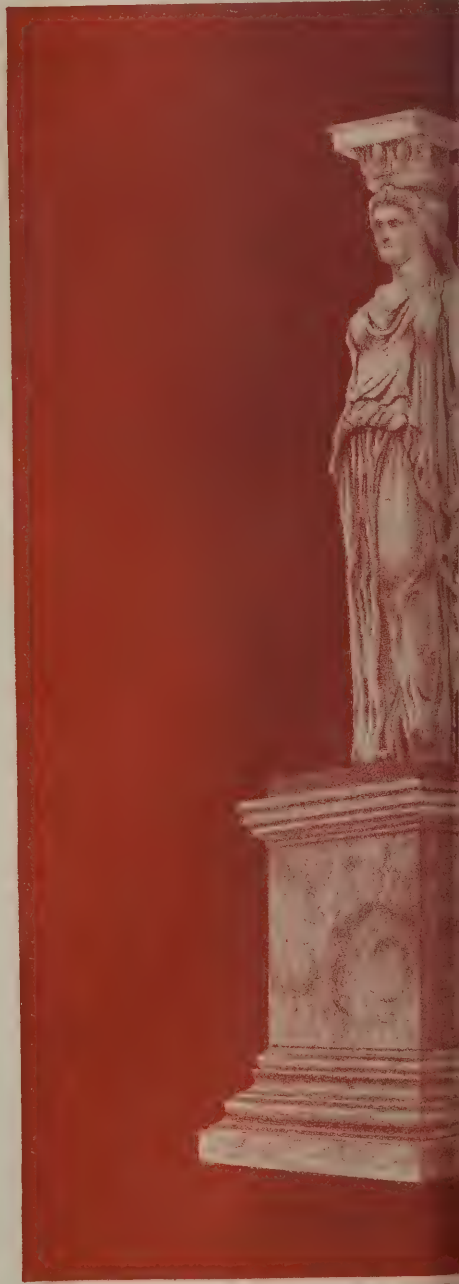
Ionic Capital.



Figure from Mausoleum.



Frieze, North Wall, Erect



Caryatid from 'Pa

SKETCHES AT  
by FRN

AWARDED PROFESSOR ROGER SMITHS P





m. (restored)



seum.

ISH MUSEUM,



Capital from Tomb at Vulci.



Cornice &c.









THE PHOTO SPRAGUE & CO. MARTINS LANE, CANNON ST. LONDON, E.C.

COTTAGES, COURTSTILE, KENT.

M. E. MACARTNEY, B.A. Architect







## ILLUSTRATIONS.

DRAINING MILL, LINCOLNSHIRE.

THE original drawing from which the illustration is taken is one of the finest of COTMAN's works. The time is supposed to be evening, and a storm is clearing off. The scene is in the neighbourhood of Croyland Abbey. The original was first exhibited in 1810. We are indebted to Mr. JAMES REEVE, of Norwich, for the use of the drawing.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 44.—COTTAGES, FLISHINGHURST, KENT. [M. E. MACARTNEY, B.A.]

NO. 45.—COTTAGES, COURTSTILE, KENT. [M. A. MACARTNEY, B.A.]

SKETCHES AT BRITISH MUSEUM.

THESE sketches suggest the wisdom of Professor ROGER SMITH in utilising the treasures of the British Museum for his architectural class. The prize drawings are by Mr. ERNEST RUNTZ, who, although a young man, has already made a name in his profession.

## YORKSHIRE UNION OF ARTISTS.

FOR the advancement of art in Yorkshire a new movement is now afoot, says the *Leeds Mercury*. The Mayor of Bradford will to-day (Monday) declare open to the public the inaugural Exhibition of the Yorkshire Union of Artists. The collection of works for inspection is housed in the gallery of the Bradford Art Museum. The distinction of affording facilities for the opening Exhibition belongs to that borough, because among the chief towns of the county it alone has at present available accommodation. Moreover, the Union owes its inception mainly to gentlemen associated with Bradford. The Exhibition represents the effort of a Society whose objects are the promotion of the general interests of art in Yorkshire by the institution of an annual display of work in the county, the union of existing Societies in the shire, and the holding of a yearly competition and conference in Yorkshire. The Union, on very easy terms, embraces in its membership artists, amateurs, and art students resident or born in the county, and like the shire whose name it bears, it is sufficiently broad to embrace much that is valuable, and should be capable of much that is enduring. It proposes to bring art-workers into closer association, to stimulate culture by providing incentive to emulation, and to afford opportunities for the disposal of work executed. The latter aim is not without value, for, although artists may not live by bread alone, material sustenance is not unnecessary even to artists. The Exhibitions will derive increased interest from the arrangement that work placed in competition must have been completed during the preceding twelve months. A prize fund is to be raised by donations and subscriptions, and the intention at present is to award a gold medal for the best individual work submitted, silver medals to those adjudged the best artists in the advanced sections, and bronze medals to those in the elementary sections. These awards are to be made as the result of a ballot cast by the competitors; though, while those in the advanced section may express their ideas on the works in both departments, those in the elementary section may only vote upon the work exhibited in their own section. The conference, at which the result of the ballot will be made known, is to be held early in January; but the Exhibition itself will remain open until the middle of the following month. In subsequent years it is probable that an art union, for the sale of members' productions, will be arranged.

Apathy and antipathy, usually the lot of new movements, have in this case been in part experienced. Apathy has been found the greater evil. After all, the Society makes a good beginning, so far as moral support is concerned. The patrons and vice-presidents include the Bishop of Ripon, the Lord Mayor of York, the Mayor of Hull, Mr. Josh. Craven, M.P., Mr. Josh. Woodhead, M.P., Mr. George Hull, Mr. Angus Holden, Mr. W. P. Frith, R.A., and Mr. H. Moore, A.R.A.; while its list of members already contains at least three hundred names. The present Exhibition is of more value for what the enterprise promises than for what is already achieved. Embracing very largely the work of amateurs, it is peculiarly strong in water-colour paintings, a fact which is assertive of the national characteristic of our artwork. On the walls, however, also are productions in oils which have had no mean place on the walls of the Royal Academy, and, above all, it is felt by the sponsors of the Society that it might very properly bring together annually in some town of the shire the works of

Yorkshire artists which have with more or less distinction shared in the yearly collections got together under the auspices of the great London societies. For the present venture no restriction was placed upon the number of canvases sent in by members. Out of five hundred received, rather more than half have secured accommodation. On the Hanging and Selecting Committee the towns of Hull, York, Huddersfield, Keighley, Harrogate, Leeds, and Bradford were represented, and pictures from all these, as well as other towns, have places on the walls. Mr. E. Renard, of Saltaire, is the secretary of the Council. The hon. treasurer was Mr. C. J. Durham, of the Bradford Technical College. With these gentlemen the movement practically had its inception. It is to be regretted that only on Friday last the latter succumbed to congestion of the lungs of a week's duration.

## NATIONAL ART CONGRESS IN LIVERPOOL.

THE local committees entrusted with the work of arranging the details of the first Congress of the National Art Association, to be held in Liverpool from Monday to Friday next, met at the town-hall on Monday and Tuesday.

The Congress may be said to be inaugurated on Sunday, when Archdeacon Farrar will preach both morning and evening at the Church for the Blind, Hardman Street, but the actual opening of the proceedings will be on Monday evening, when after a business meeting in the Walker Art Gallery Sir Frederick Leighton, the president of the Royal Academy, will deliver the presidential address in the concert-room at St. George's Hall.

The sectional work commences the following morning, when Professor Aitchison delivers a presidential address in the Architectural Section. The other five sections are:—Painting (president, Mr. L. Alma Tadema), Sculpture (president, Mr. Alfred Gilbert), Applied Art (president, Mr. Walter Crane), Art History and Museums (president, Mr. Sidney Colvin), and National and Municipal Encouragement of Art (president, the Right Hon. A. J. Mundella). The papers to be read on Tuesday morning are:—In the Applied Art Section, by Mr. W. E. Willink, on "The Home Arts Movement;" by Mr. G. H. Garroway, on "The Liverpool Art Workers' Guild;" and by Mr. H. B. Bare, on "A School of the Artistic Handicrafts." In the Painting Section, by Mr. James Towers, on "Encouragement of Local Art;" and by Mr. James Paterson, on "The Cultivation of the Love of Art." In the Sculpture Section, by Mr. G. Simonds, on "The Importance of Sculpture in Civilisation." In the Museums Section, by Mr. E. Rimbault Dibdin, who will give "A Contribution towards the Art History of Liverpool;" and by Mr. Charles Dyall, who will discuss the question "Do Picture Exhibitions promote or impede the Progress of Art?" In the afternoon, after an address by the President of the Painting Section, the papers read will be as follows:—In the Applied Art Section, by Mr. G. H. Morton, jun., on "The Agreement of Colour Theories with Practice;" and by the Rev. H. O. Rawnsley, on "Country Industrial Art Schools: their Aims, Claims, and Needs." In the Museums Section, by Mr. W. M. Conway, on "Reproductions of Ancient Works of Art for Municipal Museums;" and by Lieutenant-General Pitt Rivers, on "The Classification of Objects in Museums." In the Sculpture Section, by Mr. R. Pinker, on "Choice of Materials for Sculptural Decoration;" and in the Architectural Section, by Mr. J. D. Crace, on "The Proper Aims and Limits of the Coloured Decoration of Architecture;" and by Mr. E. J. Tarver, on the subject of the "Proposed Improvements in Theatre Planning."

On Wednesday morning, simultaneously with the presidential address in the Applied Art Section, the other sections will be addressed by the following speakers and on the subjects named:—By Mr. F. Bate, on "The Tendencies of Modern Art;" Mr. R. F. Hallward, on "The Emancipation of the Picture;" Mr. T. Stirling Lee and Mr. Wm. Emerson, on "The Decoration of Public Places and Buildings;" Mr. T. Graham Jackson, on "Obstacles Opposed to the Progress of Architecture by Architects Themselves;" Professor Roger Smith, on "Architecture as part of a Liberal Education;" Mr. J. Pyke Thompson, on "The Turner House at Cardiff;" Mr. Whitworth Wallis, on "A Short Account of the Birmingham Corporation Art Gallery;" and Mr. Edwin Seward, on "The Development of Local Influences for the Advancement of Art." In the afternoon the presidential address will be delivered in the Museum Section, and papers will be read by Mr. W. E. F. Britten on the subject of "Our Claims as Artists," and by Mr. H. H. La Thangue on "Art Education," in the Printing Section; by Mr. J. B. Gibbs on "The Influence of Sculpture on Painting," and by Mr. Walter Armstrong on "The Proper Decorative Use of Sculpture," in the Sculpture Section; by Mr. E. P. Warren on "The Coloured Decorations of Churches," in the Architecture Section; and by Mr. William Morris on the subject of "Art and its Producer," in the Applied Art Section. The day's proceedings will terminate with a reception



by the members of the Royal Institution at the Colquitt Street Gallery; a soirée at the Walker Art Gallery, Rotunda Reading Room, and the Brown Library; a concert at the Grosvenor Room; and an illustrated address at the Rotunda Reading Room, by Mr. Henry Blackburn, on "English and French Modern Art"; the whole to conclude with a Cinderella dance in the Brown Library.

A combined meeting of the Sections of Painting, Architecture, and Applied Art will be addressed on Thursday morning by Mr. G. F. Watts, Mr. J. D. Sedding, and Mr. G. T. Robinson, the latter of whom will read a paper on "Sgraffito and other Processes of Decoration in Plaster." In the Sculpture Section the papers will be by Mr. Onslow Ford on "The Modern Realistic School," by Mr. Samuel Fry on "Architectural Carving," and by Professor W. C. Roberts-Austin, on "The Precious Metals;" and in the Museums Section by Mr. George Wallis on "The Economical Formation of Art Museums for the People," and by Mr. Walter Armstrong on the subject of "Logic in Art." After luncheon, the presidential address will be delivered in the Sculpture Section, and papers will be read in the Applied Art Section by Mr. Lewis F. Day, on "Fashion and Manufactures;" by Sir Philip Magnus, on "The Teaching of Industrial Art;" and by Mr. T. Cobden Saunderson, on "Craft Ideals." In the Painting Section, Mr. John Brett will speak of "The Relation between the Pictorial and the Decorative Arts," and in the Architecture Section, Mr. Basil Champneys, B.A., will dilate upon "Style," and Mr. H. H. Statham on "Nature and Architectural Ornament." At a subsequent combined meeting of the Sections for Museums and National and Municipal Encouragement of Art, Mr. T. C. Horsfall will read a paper on "The Importance of connecting Elementary Schools with Art Galleries," and Mr. P. H. Rathbone an essay on "Lessons from France." A conversazione at the Liverpool Art Club, in Upper Parliament Street, will conclude Thursday's proceedings.

The last day of the Congress will commence with a combined meeting of the Sections of Sculpture, Architecture, and Applied Art, at which papers will be read by Mr. G. Simonds on "Sculpture and its Relation to Architecture," by Mr. J. Belcher on "The Alliance of Sculpture and Architecture," and a third, the title of which is not yet announced, by Mr. J. D. Sedding. In the National and Municipal Encouragement of Art Section Professor Baldwin Brown will speak on "Mural Painting," and Mr. Patrick Geddes on "Economic Arguments for the Encouragement of the Fine Arts." In the afternoon the presidential address in the Art Section will be delivered by the Right Hon. A. J. Mundella, M.P., and of course this is expected to be one of the chief features of the Congress. Mr. W. B. Richmond will subsequently read a paper on "A Strict Method for Study of the Human Figure," in the Painting Section; while in the Architecture Section the papers to be read are by Mr. J. J. Stevenson on "The Planning of Towns," and by Mr. H. Sumners on "The Practical Outcome of the Art Congress." In the evening the members of the Congress will be invited to a conversazione at Streatham Towers, Prince's Road, the residence of Mr. and Mrs. James L. Bowes.

### TOWN-HALLS OF LIVERPOOL.

ON Tuesday a meeting of the Liverpool Architectural Society was held in the Free Library, William Brown Street. Prizes were presented to Messrs. E. Thompson and T. E. Eccles. Sir James Picton read a paper entitled "Notes on the Successive Town-halls of Liverpool." He commenced by a protest against the way in which, in the design of public and important buildings, provincial architects who possessed both local knowledge and interest were passed over in favour of their metropolitan brethren. Owing, he continued, to peculiar circumstances in the rise and progress of the city, Liverpool had very little of architectural antiquity to boast of. The Mediæval castle, and its rival, the feudal stronghold of the Earls of Derby, had long been swept away. So had the quaint and picturesque dwellings which formerly lined the narrow streets. The oldest buildings which remained were St. Peter's Church, the Blue Coat Hospital, and the town-hall. Having touched upon the antiquity and development of municipal institutions generally, Sir James Picton referred to the creation of the borough of Liverpool 700 years ago by King John. In the charter granted by Henry III. in 1229 it was decreed that "the burgesses of the said borough shall have a mercatorial guild, with a hanse and other liberties." The hanse was either mercantile or town dues or a place of assembly for the guild, known originally as the Hanse House. The first building of the kind in Liverpool stood in High Street, opposite the east entrance of the present town-hall. The first reference to it was dated 1513, and was made in a document in which the building was styled the house of the Blessed Virgin. Subsequently it was mentioned as the custom-house, hall of Council, and court-house, and doubtless did duty in all these

capacities. At first it was thatched, but in 1567 it was covered with slates, and the slater had the freedom of the town conferred upon him for life on condition that he kept the roof in repair. The Mayor, in consideration of using it on festive occasions, was required to keep the glass in repair at his own expense. The building was let for "brydals" or weddings, and for dances, at five shillings a time, "to be paid beforehand." From a minute dated 1579 it would appear to have been also used as the town prison, as well as a banqueting-house. The second town-hall, underneath which was the "publick exchange for the merchants," stood in the recess at the corner of Castle Street and Dale Street. It was built in 1673, and was a quaint and neat building of brick with stone dressings, and supported on pillars. In seventy years it became necessary, owing to the growth of the town and the trade of the port, to erect a new town-hall, and in 1749 this structure was commenced on the high cross at the intersection of the principal thoroughfares, north and south and east and west—an unfortunate selection of site, which had involved the Corporation in large sums in opening up equivalent lines of communication. This building was substantially the present structure, and still sufficed when the population of Liverpool had increased 32-fold, and the commerce of the port to 250 times its volume at that time. It was a handsome building, and after various improvements, such as the completion of the north and west sides (which were originally attached to other buildings), and the addition of the north wing, it still, after the lapse of nearly 140 years, fully maintained its claims to recognition as one of our finest architectural examples. It could not compete with the St. George's Hall as regarded grandiose classicality, but for harmonious proportions, simplicity of plan, unobtrusive beauty of detail, and general effect, it had never yet been surpassed. The design was simple, bold, and majestic. There was no intricate complication of the parts, yet there was sufficient variety to avoid monotony. As a whole, it was a building of which Liverpool might be proud, and was a graceful embodiment now, as it was the forecast at the time of its erection, of the mighty commerce which extended its ramifications wherever British enterprise could reach or the British flag float. Sir James Picton was accorded a vote of thanks after his paper.

### ORIGINALITY IN DESIGN.\*

By WILLIAM BRYCE MUNDIE.

IT is said that no art can be called progressive that is not an improvement on what has been done before. To the student of architectural history it must be apparent, that as far as architecture is concerned, it is not an improvement on that of our forefathers; and we are also taught that if we had studied diligently what our forefathers had done and had profited by their experiences, by their failures and successes, we should have long ago outstripped and gone beyond them, and, backed by the historical reference, I deduce that our great fault has been a lack of directness of aim and idea in our design in order to become, apart from anything else, unique, odd and uncommon, or a more fitting modern term, "original." Architectural design is the result of much thought and invention. The thought given to it is an effort of the mind which receives its stimulus from the present and future pleasure to be derived from the success of gaining an object sought after. Invention is the effect of this thought effort; it throws a new light on the things most abstruse and produces them in order to fit the intended purpose.

So much for design itself. There are two kinds only: good and bad. Good design is an effort reached after a most deep and thorough investigation of material objects which please or disgust the mind of man, and then, by making a studious collection of whatever may so please that mind, shaping them in the proportionate forms of a building.

This is the manner in which the several styles of architecture which we admire, look up to and endeavour to surpass, were originated and brought to the surface, to sink before our eyes while we struggle to be original.

The necessity for originality in design arises from the fact that it is in the nature of mankind never to be satisfied; the more he sees the more he wants, and the more he has the more he tries to get. If it were not so, then, a building possessing every requisite and convenience in plan and arrangement, of unquestioned stability, no matter how hideous or disgusting to the eye it may appear on the outside, would be all that would of necessity be required in order to constitute a completed structure. But the design of a building is something more than convenience and stability; it indicates to the outside world and to the spectator that others have been thought of or cared for besides the owner, and that the structure was erected not for one alone, but it becomes a part of nature and belongs

\* A paper read before the Chicago Architectural Sketch Club, and published in the *Inland Architect*.



to the world. Therefore it is fortunate for us that a man is not satisfied with the necessities and conveniences of life; he looks forward to acquiring more, going beyond, seeking luxuries and admiring the beautiful; thus giving rise to a third essential in architecture, namely, "design," and any building erected and carried out without thought and study having been bestowed on these three essential points—convenience, stability, and design—is not covered by the term "architecture" at all; it is building; for a structure strictly utilitarian in principle can never be beautiful. A convincing proof of this fact is obtained by looking out of the rear windows of your own house and studying the rear elevations of the houses of those who live in the same block. Everything there, from the ash-box in the alley to the top of the wall, is positively offensive to the eye. Thus it must be conceded that design is necessary to fulfil the laws and requirements of good taste.

It is easy, therefore, to perceive that this same prevailing instinct in man, desiring something more than solidity and fitness, would also desire in a greater degree something other than sameness and repetition; hence originality in design or architecture proper, as I consider the third essential, "design," the highest attainment to which an architect can aspire. A man can construct or study out a plan and be totally unable to design, but a man who can design in a proper architectural interpretation of the word can command all three of these essential points; otherwise from that he approaches the sphere of a decorator, and there is a vast difference between an architect and a decorator. Something more than decoration occupied the minds of the architects of the Old World, who reasoned and thought, constructed and designed, before they decorated.

Originality in decoration has a tendency to aim at extreme novelty. Now, there is no harm in novelty. Taken by itself it may be beautiful, but without a motive it can never be anything but a fault in architecture proper, and when it is sought after solely for the sake of novelty, it is then destructive to both art and good design.

The constant search after novelty by designers to-day is one of the sources of bad taste in our modern architecture, and it is often adopted to save time and study, and thrust upon the public something they barely understand, thus impairing the good taste which the public should be educated up to. Good taste in architecture is a thing of much thought and study; it owes all its value to thought, and it is beyond any man who will not stop to think. He becomes thought-grudging and vulgar; to him pure taste must be utterly unintelligible and almost inaccessible. Even his work will show it on the face, expressing a fickleness, affectation, and thought-flying hurry.

The hunger after novelty in our architecture is getting to be insatiable, and owners as well as architects appear anxious to obtain it, no matter what sacrifice of truth and cost it incurs. Heaven and earth are racked for something novel, and happy is the man who shall hit off something, no matter how bad, if it will only strike the common taste, "catch on," so to speak, and has what we might term the "run of the season." This is certainly originality, but it is rather of an illegitimate sort, and that which the finished designer abhors, yet has to admit in his dealings with a people who are original if they are nothing else, and who seem to possess a belief which is getting to be too prevalent, that knowledge, skill, and taste are inborn in a man, and come by nature, and what may be beauty and excellence in a design is often spoiled and overruled by the owner, who makes no scruple of setting up his own taste against that of the architect, and altering and changing the design at his pleasure.

A certain amount of novelty, or, rather, the searching after it, might be termed original in design, especially in the formation of any new style; but a new style is not developed in a day; therefore, novelty is admissible only in a comparatively small degree.

The distinction between novelty and what we call legitimate originality is rather difficult to determine, and what we term legitimate originality is hard to define: but the architect to-day who catches at the spirit of true architecture, and not that of any one style, and who can successfully combine these two attributes, making a pleasing fusion with the present style in vogue, is regarded as being original, and is likely to be the recipient of favourite commissions; hence the inclination to be original, or counted as such, on the part of the architect; for Americans like originality; they possess abundance of it themselves, and as far as that which pertains to designing the construction of our buildings is concerned, they beat all creation; but too much of their design proper is irrational and lacking of a definite aim. If there is such a thing as one nation's possessing more originality than another, America should, on account of her mixed population from all parts of the civilised world, each one bringing with him from his native country new ideas, &c.; but all these ideas, good in themselves, no doubt cannot be put through the mill at once, and we look to time to ultimately accept or reject, and engraft those acceptable into one another, each in its proper place, and this cannot

be accomplished without considerable ingenuity and originality on the part of our designers themselves.

It has frequently been asserted that we, in America, who have no past history, should cast off all conventionalism, using no precedent to govern the design of our buildings, thereby forming a style of our own, and of our own materials. Now, while it is not my desire here to approach the hackneyed subject of an American style, I speak of it merely looking toward the great point which would underlie such a thing, namely, originality. First of all, it is against nature, science, and art to ignore the past. You cannot do in a day or a generation what has been accomplished in a thousand years; besides, the enlightened people of this country, original as they are, would rebel against being used as subjects for experiment on such a large and stupendous scale; moreover, we do not need any such sweeping change. We are too original now; our design to-day is too eccentric and erratic, the result, I think, as I saw it mentioned somewhere recently, of the fact that we are, in a measure, living in a practical age; scores of young men who once intended to enter the learned professions, as they are called, are to-day leaving our colleges and entering into the practical pursuits, as the vast needs of our time and country demand better attention and educated study bestowed upon our architecture, engineering, and science, and the result of the fusion of this vigorous young blood is to be original at any sacrifice. Still the peculiarities of a few years ago show a more sober and quieting expression; there is a perceptible rational and true, showing that we are slowly recognising the toning-down effect prevalent in the work to-day that is more deficiency of truth, thought, and reason in aim and idea.

It is in our city buildings that we fail most; our suburban and country Domestic architecture is original, beautiful, and true, and above comparison with other nations, but there is room for improvement in our city residences, though of late there has been a great improvement in this class; still they lack dignity, repose, and expression, more the fault of the owners than the architects, for the owners of our city mansions lack dignity in their manner of living, on account of the immense success of the suburban residence, which retains the charm of American home sentiment which pervades it, and this will be a difficult matter to overcome, if it ever can be accomplished.

Our business buildings are lacking most of those qualities which are so essential to good design, breadth, harmony, repose, and continuity of line and surface, and here again the practical age asserts itself; the first storey of a many-storeyed building must approach as near as possible that of a conservatory; the store tenant must have it so, in order that he can make his inartistic display; bay windows, frequently many storeys high, constructed on sham principles, are made to project out of the top of the conservatory without any visible means of support other than a *repoussé*, fancy copper bottom. Nevertheless, the tenant must have it, and there appears to be no help for it but to wait for an uneducated public to learn to appreciate and recognise the beautiful and true consistencies of architectural art. The chances are that we to-day may not see it, but we hope for the future.

How can we become legitimately termed "original"? It is said to be impossible for a designer to produce anything true unless he appeals to nature; it is also an axiom that he can produce nothing new unless he possesses a knowledge of what has been done before. The most original architects are or have been the most extensive imitators, and I think, without exception, that all the men of genius that I have known or read of, whether architects or not, have been assiduous and persistent workers and ardent students of the masterpieces of their forefathers. Take, for instance, the value of the example of the late Mr. H. H. Richardson, who will not be charged with any lack of originality, yet his whole life was a personal exemplification of the foregoing facts. The value of Mr. Richardson's example also lay not in the style he chose but in his power to adapt it to the qualities of design at which he aimed—in other words, the use he made of it in his untiring efforts to express certain high qualities in design which others had neglected, and when once he found them he steadfastly adhered to his convictions. To-day we haste to imitate his most common features, details, &c., which appear most in different places, altogether ignoring the breadth, subordination, simplicity, and repose peculiar to his work, and the aim and idea which is apparent to one who strives to fathom the measure of his liking for his style.

In connection with originality Sir Joshua Reynolds says:—"He who resolves to search no mind but his own will soon be obliged to imitate himself." He also states, regarding invention:—"Invention, strictly speaking, is little more than a new combination of those images which have previously gathered and deposited in the memory. Nothing can come of nothing. He who has laid up no materials can produce no combinations." Therefore, the more extensive our knowledge is of the works of others who have excelled in their art, the more extensive will



be our own ideas and inventions, and the more original will be our conceptions.

Sir George Macfarren, in his last address to the Royal Academy of Music, gave the following advice to students and young composers. I do not quote his exact words, as it pertained to the composition of music, but the main ideas are applicable alike to the young composer and the young designer; therefore I take the liberty to insert the word design for that of compose, and reconstruct a few sentences; but let every young aspirant in design think thoughtfully over them.

"Those who design must make mental studies; it is not to occasionally design a piece of furniture, or an elevation, but to have a constant habit of constructing things, of planning arrangements and exercising the faculty of invention and design, for it is never in the career of a designer to say 'I have finished.' It is the constant seeking advancement which is the real means of developing the faculties wherewith nature has endowed us all. In order, therefore, to master the art fully, and to do justice to the productions of present times, they must have a knowledge of the works of preceding periods. Let them work at the productions of the masters of former times, and then see the productions of their own. They will then have the conviction that originality can only find its proper expression when they have commanded, by constant exercise, such power over their faculties as would enable them to produce that which is in themselves."

Thus it will be seen that to study the ancient styles is indispensable. By study I do not intend that we should make exact copies of the works of the ancients, but study the why and wherefore; the reason and motive for adopting this feature and that feature, which, should you adopt it at all, you would so modernise it that everything except the aim and intention would wear a changed appearance. This manner of study will give us sufficient knowledge of the forms of the past, and will teach us to use their principles and not their forms, for the customs of the people and the age in which we live dictate to us and resolve into shape the form of a building we should erect.

I think, also, that a knowledge of the styles of the past is desirable, in order that we may perpetuate and modify those architectural forms given us, adapting that which to us may appear best to our present requirements, considering how to make the most possible and most rational use of that which is handed down to us, and blending it with that which our own age, knowledge, and materials supply us, for changed materials in the past few years have altered our whole system of construction and utility, and in architecture, as in other arts, two things must always be borne in mind—the intention, and the materials used to express and carry out that intention.

It would certainly be the height of folly to ignore and cast aside all that which has been handed down to us by those who, in their day, thought almost entirely for themselves. They did not receive weekly or monthly several technical journals, &c., each exhibiting plans and designs of every constructible under the sun; and here lies an open question—Whether it would not be better to make us depend more on ourselves, thereby forcing us to bestow more thought and study on our designs, if we did not receive so many of these ready-made ideas? It would certainly be cultivating true originality on our part.

The man who gets an idea from an ancient or even a modern architect and designer and so engrafts it into his own work that it becomes harmonious throughout can hardly be charged with plagiarism, nor should this use or adaptation of the actual designs of others be accounted an architectural sin, for it may frequently happen that two inventive minds may run along in almost the same channel affording almost similar results, yet each totally ignorant of the doings of the other. Before leaving the question of imitating the ideas of others, let me add that the great success and value of this borrowing does not lie in the exact copy or correctness of imitation, but it depends greatly if not entirely on the designer and on the headwork he displays with the breadth of generalisation that accompanies it; for that which simply imitates without generalising, even though the model possess many excellences, does not approach art at all; and it might be well to pause here and note this fact, that nothing but good examples should be used for the purpose of study, otherwise originality is less to be hoped for in each succeeding age, for a designer will reproduce something of the works through which his studies have been made, imperceptible though it may be at the time to himself. It may also be said regarding the study of the examples of others, if a thing is good, is it not too good to be given up? If so, is it not too good to be caricatured and abused, or, in other words, if it is worth copying at all is it not worth copying completely?

Yes; but this can never be done without copying also its construction, and how often will this somewhat out of date idea work in and adapt itself without any alteration whatever, and fill the place completely? Never, as long as our modern habits, materials, and means keep changing; and the same applies to design or style as well as construction. The rest of the build-

ing is laid out on a modern basis; then the feature, good in itself in every way, and in its own position from whence it came, will become hideous and out of character with the rest of the work.

The old styles are and perhaps ever will be imitated, as by far the greater number of our works to-day are based upon imitations; but the designer must go with the spirit of his own time or else be able or strong enough to lead it, for the period of style in which we live not only makes the designer as much as he makes the period, and when I say the spirit of his own time I do not mean the prevailing fashion, fads, and eccentricities that are prevalent at that time, though to some to-day this appears to be all important, and any new publication by architects of reputation, or any work of decoration in process of execution from their designs, is eagerly sought as a source of present profit, and considered more valuable than in the end, being led to a fuller sense of the beautiful and true at the expense of attaining facility, readiness, and being well up with the prevailing fashion in which he lives. Architecture does not consist in a series of fads, fashions, and erratic novelties, each having its own successful run to die a death and pass into oblivion; it is something higher and nobler, expressing in materials ideas which have truth for their beginning and ending.

We should aim at catching the true spirit of architecture, and not that of any one style, much less a fashion of the day, which depletes our stock-in-trade at the end of its questionable run, finding that we must begin over again, starting on a new tack, cruising round with a weather eye bent on the doings of others, hoping to pick up some clue or purpose that would help solve the problem; still, at the same time, this quality, this searching the doings of others, is of considerable importance, and not unattended with benefit to the searcher, as I think every reflective man should post himself on the doings of others who are co-workers in the field for and against him, endeavouring to get at all sides of the case, holding himself as an umpire, forming his own opinion of its merits and passing judgment upon it. We become in design akin to our politics and religion, prejudiced, and all in favour of one style or period, and stand still by it until others have left it and gone off into something else which is more taking; then we are at sea with ourselves unless we possess that knowledge of what has been done of the kind before. Should we possess this knowledge, then is the time to adopt the new, adapting that which is rational and fit and applicable, avoiding peculiarities and eccentricities of style at first, though this will be found difficult to do, as it seems born in the nature of imitators to seize on the most salient points of good or bad design and exaggerate them. Peculiarities in design and style are generally defects. It is by peculiar features that we distinguish one style from another, and it is by these peculiarities that any one will recognise the style at first sight, and which any mechanic may copy, that mislead and cause designers to veer round from one thing to another without showing any search for the real excellences of the style; these lie deep below the general first glance, and require considerable thought and study to enable one to eliminate them, not to speak of adapting it to fill a certain requirement in what we term a more modern style.

This imitation of peculiar features in design, which are oftentimes inessential and mistaken for beauty, will most often appear in the work of a designer who has one favourite master, and even though he choose the best work and is capable of discerning good from bad, will never obtain in this way what we would call originality in the mastery of his art. Slightly new features, however, can be introduced into our designs with considerable success, providing the new can be fused with the old in a legitimate manner, and the monotony of our work becomes somewhat relieved in this way; but if this new element is too new and foreign, it becomes difficult to fuse with the old, our eye seeming equally to hate too wide a deviation at all. Or, in other words, if any one gives us a new idea, which is not too far ahead of us, such an idea is often of great service to us, and may help to give new life to our work. In fact, we soon fall back unless we more or less frequently come in contact with new ideas and are capable of understanding and making use of them; but, on the other hand, if these new ideas are too new and too little led up to they put us out with every degree of completeness.

After all, there is no better foundation for good design than the act of searching for the principles which govern it, and when found by steadfastly adhering to them; there is no other royal road to it. Beauty of form should first be sought after and acquired, and then the leading lines decorated. No amount of effective ornament, original as it may be in itself, will ever make an original and good design, though few architects seem to acknowledge this either in practice or theory. The rule that the greater should regulate the less should follow in a building; the building blocked out roughly, should regulate the design and ornament, and also all which it contains; furniture and decorations should all conform to its characteristics, thus giving a proper uniformity of style and design through-



out and a subordination of all inferior objects to those of greater importance, giving a broad and widespread sentiment, which I am afraid in our times is wanting, for how many people, and wealthy people, too, erect their houses with rooms totally incongruous in character the one to the other, the same applying to the furniture, &c., till the house is like a museum, showing a vulgarised taste and a false belief of beauty and uniformity, for unity of design, style, and decoration of all things that are parts of a whole are indispensable to true taste.

Let us take, for instance, the case of the general client of to-day. I may say there are some exceptions to him for which we are truly thankful. He enters an architect's office and starts the conversation by stating his wants, desires, &c., in regard to the future house. His greatest want invariably is to get the house for half what it will surely cost him. His next want is to design the house from within, and in this he has an able second in the personage of his wife, or daughter, as the case may be, sometimes both, and oftentimes several more. He proceeds by jumps of one room at a time, without any general or definite idea of the whole. He wants the hall like Mr. Someoneelse's hall, the dining-room like that of some other house, and so on, utterly regardless of anything else but to have them just so, and nine times out of ten when he gets it that way it is not what he wants at all; it is but a taking fancy of the moment, and he allows it to mislead him without thinking it over seriously, for when completed, Mr. Someoneelse's hall and Mr. Otherhouse's dining-room are entirely of a different plan and feeling from each other, and so on throughout the house; they were all designed by different minds on different principles, probably the hall from a sea-shore cottage, and the dining-room from a city mansion; but no matter, they pay their money, and they must have it. Thus the architect receives his idea of the future house, from basement to roof, and he makes his plan accordingly. Then he is confronted with one of the meanest tasks which can be imposed upon a designer who takes any pride in his work at all, namely, to design an interior to fit the plan as laid out, a scheme as ridiculous in principle as making the window openings to fit some old sash that may be on hand. The whole house has been designed from within, without reference to the multitude without; the man without is confronted with a flat, featureless pile showing lack of thought and study, the salient corners and the recesses of the given plan forcing upon the public an eyesore to which they must become accustomed, and thus the general taste and culture of the masses is undermined, and all for the sake of one "must have it" individual, who, let him live in his house ten or fifteen years, will probably tear out and alter anew the inside, but the outside swears on at the public for a quarter of a century.

On the other hand, you may say, who will occupy this house when finished, the owner or the spectator? Is it not the owner's privilege to do as he pleases, to so plan his house as he wishes? Certainly it is he who owns the inside and nominally the outside, let us grant him that; but the public are entitled to some consideration, for every man born in this world owns his just share of this earth as nature designed it, and no one has any right to artificially despoil her. It is the duty of the owner to consult the observer, to erect what will not prove an eyesore and a nuisance to the general public. Thus it is that the best ornamental detail, feature, and design is not only required but really demanded by the laws of nature and taste, and it is by the abominable treatment of these laws that we have so much of, what I term, enforced originality in our architecture to-day. This forcing upon the designer set and rigid requirements is not only bad in itself, but leads to others; he sees the hopeless task before him, and sets to work on the next best thing by sticking an ornament wherever there is a place for it, usually where it will be most conspicuous, not where it will most improve the building; but this deception is thin. No one is so easily deceived. You cannot hide the want of thought and study by any amount of ornamental frippery; in fact, it is rendered all the more offensive by adding ostentation to it. This the observer does not want. He cares not for ornament, which shows that the owner possesses so much money, but he does care for the owner and for the owner's consideration bestowed on him. Nothing short of this will satisfy the spectator. Show him by thought and study that his wants have been considered.

Of course, I do not wish to imply in these foregoing remarks that ornament is not essential to beauty; quite the contrary. It is really a natural want. The rudest savage shows some affiliation for it, but as some men to-day buy and wear their jewellery a size larger than any one else, it is so with a great deal of imitative ornament—always a size larger than our neighbours, more imprudent than the true thing, exciting our contempt by the meanness and vulgarity it displays on the building it is intended to adorn. See how nature ornaments and decorates herself; there we may learn something of restraint and be warned against over-ornamentation; just see how she restricts her true ornaments (the flowers) to the most telling and culminating points of plants, sprinkling them

sparingly, and contrasting them with a vast expanse of foliage, while we, by the many artificial aids, strive to force her to the opposite by demanding more ornament than background. Seeing this, should we not liken unto nature our great and only teacher, follow her dictates on this point and concentrate ornament, leaving wall spaces intact?

Before leaving this point of ornamentation I wish to make more clear a foregoing statement, "that ornament is essential to beauty," by saying that at the same time it is not always necessary, for strip a house of its ornament if it is still in harmony, if it still retains its pleasing proportions, it is not necessary that its ornament be restored; but, if restored, it will not be added in vain, provided it be properly placed and consistent with the style and character of the work; if it is not pleasing when stripped of its finery, then no amount of ornament can atone for lack of design and proportion.

In conclusion, if any views of practical value are herein advanced, if they be admitted as worthy of discussion at all, they will, I hope, be of value as regards the betterment of the profession individually and collectively. First, we grant the public the right to demand beauty and truth in our buildings, and does it not then become our duty as architects and designers to endeavour to educate the public to recognise this beauty? educate them to the idea that architecture is the highest art? We also see the folly of designing novelties on too large a scale and of not making them at all. We see that new ideas cannot be fused with old, save gradually, and by patiently leading up to them in such a way as to admit of a sensible continuation or identity between the old and the new, even nature wishing to take her own time. I have also pointed out that our great architects, musicians, poets, &c., owe their distinctions more to assimilation and fusion of all the good that has been done up to, and especially near about their own time, than to any very great and startling steps they themselves may have taken in advance. Also, that we should borrow from every style, from every era, and from every form, in order that we may, in time, become original in ourselves. Therefore, let us step forward and take advantage of what has been done before, find out if we possess any of this assimilating power, this power to adapt and complete the fitness of things, not only for our own benefit or advantage, but for the future of a nation whom I hope in the not far distant years will hold the proud distinction, architecturally, in comparison with other nations, that she does politically, commercially and otherwise—the grandest on earth.

#### ORGANISATION OF WORKS DEPARTMENT OF THE LONDON SCHOOL BOARD.

THE following are the recommendations which the Investigation Committee offer upon the organisation of the Works Department of the London School Board:—

That an assistant architect be appointed to superintend the construction of new schools and enlargements.

That in future the architect shall, as an experiment, make use as far as possible of the draughtsmen in his office for visiting the schools and enlargements in course of erection, and that the question of making any addition to the staff for this purpose be settled hereafter.

That upon the approval of the plans and specification, the Works Committee shall nominate a quantity surveyor to take out the quantities.

That six quantity surveyors of known reputation be employed to take out the quantities for the schools of the Board, the remuneration being an agreed percentage, to be calculated on the total amount of the contract (including provisions).

That the outside surveyors appointed by the Board shall receive from the Board's land surveyor a plan of the site, with levels marked thereon, sufficient to calculate the surface when the site is given into the contractor's hands and the standard printed specification, with notes of any variations proposed by the architect. They are to prepare detailed bills of quantities in the manner recommended in the reports of the Board's professional adviser, and to calculate all necessary provisional sums (those for entire buildings excepted). They are to correct the specifications, inserting all additional information necessary fully to make the quantities and specification agree together, and to excise all unnecessary clauses; to give to the builder a copy of the dimensions at his request, and at the cost to him of the actual expense of copying; to deposit the original dimensions, fully indexed, and the abstracts with the architect, and to examine the priced bills when they are deposited, to see that they are fully priced out to the amount of the contract. For these services they are to receive an agreed percentage on the amount of the works above mentioned, and the cost of lithography and any necessary expenses, to be paid direct by the Board when the first certificate is granted to the builder.

That payment to the quantity surveyors be made direct by the Board.



That, previous to the building of any school, the Board shall advertise their willingness to receive tenders for that school from builders who are desirous of tendering.

That the list of applicants shall then be submitted to the Works Committee, and, after consideration by them, tenders shall be invited from those of the applicants who fully satisfy the conditions laid down. (The following is the suggested form of advertisement:—"Persons desirous of contracting for erecting, under conditions laid down by the School Board for London, a new school at \_\_\_\_\_ are invited to submit their names, giving references as to character and work executed, by letter addressed to the clerk of the Board, on or before \_\_\_\_\_")

The Board do not bind themselves to reply to, or to accept, any such application."

That it be an instruction to the Works Committee before inviting a tender from any builder for the erection of any new school or substantial enlargement, to satisfy themselves that the character of the work previously executed by such builder, either under the Board or elsewhere, is of a thoroughly substantial and satisfactory nature.

That a copy of the specifications of all works included in provisions be sent by the architect's department to the clerk of the works, and that he be made responsible for seeing that they are properly executed.

That in all cases where the opinion of an expert is required, as in heating and drainage, such an expert shall be employed by the Board to examine the work, and certify that it is properly executed.

That the measuring-up of variations on schools and enlargements be in all cases done by an officer of the Board.

That the measuring surveyor, who will eventually make up the accounts of buildings, shall measure the foundations at the time that that part of the work is completed; and until the work is finally measured and settled between the Board and the contractor, no work shall be covered up.

That no deviation from the original plans or specification shall be allowed, unless either the sanction of the Works Committee has been previously obtained, or indemnity from the Works Committee obtained at their next meeting.

That the valuing of work executed with a view to granting certificates be made by the measuring surveyor's department in the architect's department.

That the general repairs to schools, except the heating apparatus, gas-fittings and ironwork generally, and the erection of cookery centres, deaf and dumb centres, schoolkeeper's houses or such like work, shall be under the supervision of a superior officer in the architect's department, who shall be generally responsible to the Works Committee.

That clerks of the works for repairs be placed in charge of a number of schools, not exceeding thirty, whose duty it will be to report upon any work requiring to be done from time to time at the schools under their charge in order to keep the building and furniture in proper condition, and superintend the performance of the work, keeping a strict account of the labour and materials consumed, where necessary, for verification of accounts at end of job. That these clerks of the works be assisted by the schoolkeepers, whose duty it will be to point out anything which may not be properly carried out during their absence.

That no clerk of the works shall be nominated to the charge of any works, except with the approval of the Works Committee.

That tenders, based upon schedules of prices, both for general repairs and painting, be obtained, and firms appointed for divisions or groups of schools willing to carry out the work. That no sub-letting be allowed.

That all furniture, such as cupboards, tables, chairs, mats, fire-irons, coal-scuttles, &c., with the exception of desks, be delivered at a store in such quantities and at such times as may be necessary, and there be carefully examined by the Board's officers to see if they comply with the conditions of contract before the account is passed. That desks be delivered at the schools and examined by the clerk of the works in charge of the school. That annual requisitions, countersigned by the managers, be prepared for the purpose, to be made out by the schoolkeepers for all store articles, the requisition to state whether they are required additionally or in lieu of worn-out articles, or if for repair, and to be dealt with in the same manner as requisitions for other stock articles.

That the whole of the clerical staff be placed under the charge of the principal clerk, who in addition to the duties at present devolving upon him, shall have charge of the schoolkeepers, the advertising for all tenders and passing of all accounts on to finance department after they have been certified to by the architect or clerk of the works.

That, in every case where defective foundations have been found to exist, or where work has not been done which has been paid for by the Board, proceedings be taken by the Board against the contractors wherever they are advised that they have grounds for action.

That Mr. Rickman and Mr. Ewan Christian be employed

by the Board for one year to advise in the carrying out of the above recommendations at the same rate of remuneration as hitherto, viz., 10s. 10s. per day of eight hours, counting the actual number of hours they are occupied on the work of the Board.

### ROBERT BOYLE & SON, LIMITED.

THE third annual general meeting of this company was held at the Cannon Street Hotel on the 21st inst., Mr. Gilbert Wood presiding.

The secretary (Mr. J. A. Dargue) having read the notice convening the meeting,

The Chairman said:—It is quite unnecessary to read the report which has been placed in your hands, and I daresay read by all of you, and likewise the balance-sheet accompanying it, and therefore it simply becomes my duty, and a very pleasant duty it is, to tell you that we are again prepared to pay you a dividend of 12 per cent. In many companies the chairman on these occasions has to gild the bitter pill that the shareholders have to swallow, but in this case the pill is of solid gold in the shape of 12% for every 100% invested, and consequently the work of the chairman is very easy. I may say that, from the personal knowledge I have obtained of the position of the company, I am persuaded that next year and the year after next—I think we can see forward as far as that—are not likely to be one iota less prosperous than the years gone before. From the orders we have in hand, and others which we know are coming in, we are in a position to say that the year we are now entering upon will, in all likelihood, be even more prosperous than that just closed. In making this statement I wish to take no personal credit for the satisfactory position the company now holds. For that we have to thank the splendid business abilities of our managing director, seconded by able workmanship and willing assistants in every branch of the company's business. Under these circumstances we can look forward with hope to the future, as we can certainly look upon the past with satisfaction, and it is with great pleasure that I now beg to move the adoption of the report and accounts.

Mr. H. P. Stebbing (a shareholder):—I have much pleasure in seconding the resolution. The accounts which have been presented to us are very satisfactory; not only as good as last year, but as a matter of fact much better, and I think this state of things is likely to give considerable satisfaction to the general body of shareholders.

There being no questions, the report and accounts were then unanimously adopted.

The directors and auditors having been re-elected, Mr. Stebbing proposed a vote of thanks to the chairman and directors for their excellent management of the business during the year, and suggested for their consideration the addition to the board of another director, residing in London, to assist them in their labours. The small attendance of shareholders to-day was, of course, the outcome of the prosperous position of the company, but he was one of those shareholders who made a practice of attending the meetings of companies in which he was interested, as he thought that directors liked to meet the proprietors from year to year, and when the affairs of a company had been so well administered as those of Robert Boyle & Son he thought the least shareholders could do was to come forward and express their thanks to the board.

Mr. Eckstein seconded the resolution, pointing out as a satisfactory feature of the management of the company the small amount down for bad debts in the accounts submitted.

The resolution was unanimously carried.

Mr. Robert Boyle, in acknowledging the vote on behalf of the Board, said:—I have to thank you for the very encouraging expressions you have made with regard to the work of your board, and I have pleasure in taking this opportunity of acknowledging the valuable and disinterested services rendered to the company by our esteemed chairman, Mr. Gilbert Wood, to whose able assistance, along with that of the officials of the company engaged in the Glasgow and London offices and works, we are so much indebted for the present satisfactory state of the business, with regard to which you will see from the directors' report and the balance-sheet that the year ended has been a very successful one in spite of the almost unprecedentedly severe winter and summer, which naturally would be expected to affect the demand for ventilating appliances, as in very cold weather the necessity for a constant change of air in buildings does not so strongly force itself upon the minds of people as is the case when warm weather is experienced. I am glad to say that the demand for the various ventilating appliances manufactured by the company continues to increase both at home and abroad, which may be said to be owing, to a considerable extent, to not only our constant efforts to meet the requirements of our clients, but to the well-proved superiority of the latest improved form of the air-pump ventilator, patented in 1882, which is much more efficient and reliable than any of the



previous forms, and is now sold at about 50 per cent. less than the inferior forms formerly manufactured; at the same time the ventilators are now made of a more ornamental character, and of the best rolled steel plates, galvanised, and painted with enamel paint, whilst the workmanship is of the highest class. Though this, of course, has very considerably reduced our profit on each article, the remarkable increase in the sales, which has resulted from thus reducing our prices to a minimum whilst providing nothing but what is of the best quality, has enabled us to not only again pay a dividend of 12 per cent., but to place one-sixth of the profits to the reserve fund, besides carrying a substantial balance, 1,248*l.* 11*s.* 1*d.* forward to next year. The orders and sales for the past year show, I am pleased to say, a very satisfactory increase on the previous year, though that year was an exceptionally good one, whilst the profits are increased in proportion. We have, of course, as you are aware, rivals in the field, some of whom, however, have dropped out since last we met here, as the majority evidently act on the supposition that they have only to offer a ventilator at a very low price, "got up" to resemble, in external appearance, the air-pump ventilator, to insure a ready sale for it, quite irrespective of its lack of merit and inferior material and workmanship. They sooner or later, however, to their cost discover that architects are quite as well able as other folks to tell a genuine article, also when they are getting value for their money and when they are not, and that certain things, though offered at a seemingly low figure, may be dear at any price. I am pleased to say that the foreign agencies continue to develop in a very satisfactory manner and to yield good results, the air-pump ventilator and other appliances being introduced with considerable success to a large number of important public buildings in Germany, France, Belgium—where the system was applied to the Brussels Exhibition buildings—Holland—one contract being just executed at the Hague, embracing seventy-six air-pump ventilators—Spain, America, the Colonies, and other countries. The ventilators have also been adopted in the Dutch navy, and other important contracts for the ventilation of ships have been secured and executed. Agencies have been established during the year in Norway and Sweden, also in Russia and Italy, and a considerable addition to the business from these sources may be expected.

Mr. Stebbing asked a question regarding orders for railway-carriage ventilators for Germany.

Mr. Boyle said experiments were being made by the German Government on their different lines, but those interested were very careful in coming to a decision, as the substitution of the company's ventilators for those at present in use involved a radical change from the existing system. He might add that he had recently visited the principal towns of Italy, and he was satisfied from what he saw that, with proper push, a fair business could be obtained. He understood that the company was going to be invited to furnish a scheme for the ventilation of the Italian Houses of Parliament, and estimates were at present being prepared for the ventilation of a number of important public buildings in Milan and other towns.

The proceedings then terminated.

#### MASONIC TEMPLE, KIMBERLEY.

THE foundation-stone of a Masonic Temple was laid on Oct. 10, in Dutoitspan Road, Kimberley, the capital of the South African diamond fields. The building will consist of two blocks, attached and communicating with each other, the first block consisting of a double storey building, and the back being the temple. The order of architecture is Corinthian, access to the building being gained through a handsome portico supported by six Corinthian columns and capitals. This opens into a spacious entrance hall, 30 feet by 20 feet. This entrance hall leads into the tilers' hall, which forms a lobby to the temple which is contiguous. The entrance hall is flanked on each side by two degree rooms of the same dimensions, approached from the tilers' hall through separate preparation rooms. These degree rooms will be provided with platforms and pedestals. The temple itself is to be a very substantial building with a good floor, with the three steps and platform at the end. The interior measurement is 60 feet by 35 feet, or about the same size as the town-hall. The decorations will be appropriate Masonic panels on the walls. These panels will be formed between projections which form part of the walls. The masonry work will be 2 feet thick, and the height of the temple from floor to ceiling will be 30 feet; the roof will be massively constructed, and be of the description known as a hammer-beam roof, the projections in the walls noted above being carried right up to the ceiling. The ventilation of the temple is on a novel system, and one which seems particularly suited for such a building. In the solid walls air shafts are being built, about 10 feet high, at stated intervals, and these shafts connect with the underside of the floor, inside the walls; the fresh air is let in under the floor by means of ventilators be-

tween the air shafts, so that plenty of fresh air will be constantly supplied, and no fear need be entertained of anything being heard outside. The vitiated air will be drawn off by means of exhaust pipes fitted in the apex of the roof; thus a vacuum will be caused in the interior which will be immediately filled by fresh air drawn by the inlets connecting with the underside of the floor. On each side of the building lavatories and offices are to be built in a substantial manner, and these will be accessible from the outside as well as inside, thus forming, in case of necessity, additional exits. In the entrance hall is to be a handsome ornamental staircase in the centre, which will be lighted by a large landing light about 10 feet square. The upstairs of the building consists of four degree rooms which average about 20 feet by 15 feet. The front wall is to be finished with balustrading and parapet coping, and other enrichments will be brought into play to add to the appearance of the building. All the windows are to be fitted with revolving window shutters inside. The steps and floor of the portico, all the sills, dressings, &c., are to be of Modder River freestone, so it will be seen that everything is to be done to make the building handsome and substantial. The architect is Mr. H. A. Reid, who was the successful competitor when plans were called for. His design was submitted, and the estimates being within the limit the committee had allowed for, the plans were accepted. The successful tenderers were Messrs. Beckett & Morgan, and, remarkable to say, the tender was not above the estimate. The work is to be carried on under the occasional superintendence of the architect, and it promises to be one of the most massive buildings in Kimberley, and an ornament to the place.

The Masonic Temple is to cost about 4,600*l.*, and in it the business of the various Freemason lodges in Kimberley—the Richard Giddy, Cosmopolitan, Athole, Peace and Harmony and Concord Chapter—will be transacted.

#### CHURCH BUILDING AND RESTORATION.

**Ginderford.**—The foundation-stone of the new parish church of St. Stephen's was laid on the 1st inst. by Lady Crawley Beevey. It will consist of nave and aisles, chancel, vestry, and a lofty tower with spire at the north-west angle. Accommodation will be provided for 567 worshippers, and the plans have been prepared by Mr. E. H. Lingen Barker, of London, Hereford, and Swansea.

**Dursley, Gloucestershire.**—On Thursday, November 22, a new reredos, pulpit, tribune for the clergy, and arcading above the existing choir stalls were dedicated. The reredos, the munificent gift of Mr. and Mrs. Searancke, of the Rangers, Dursley, is arranged in two tiers of subjects, being painted on panels. In the centre of the lower tier, and standing on the super-altar, is a handsome new altar cross of brass and copper. This is the work of Mr. T. J. Gawthorp, of Long Acre, and round it on the reredos are painted, on gold grounds, the heads of Abel, Noah, Abraham, and Melchisedec, flanked on the north side by the "Annunciation," and on the south side by the "Presentation in the Temple." These subjects, being those of events in Our Lord's life of suffering, will always be exposed to view; but those in the upper tier, which portray Our Lord in Glory with attendant saints, can be closed with shutters during solemn seasons. The panel in centre represents Our Lord in Majesty, and in the four shutters, two on either side, are represented kneeling figures of St. James the Great (the patron of the church), St. Mark (patron of the chapel of ease), St. John the Evangelist, St. Mary the Virgin, St. Mary Magdalene, St. John the Baptist, Moses, Daniel, St. Augustine of Hippo, and St. Alban, the proto-martyr of England, with their various emblems and attributes. The outer shutters contain four archangels—Gabriel, Michael, Raphael, and Uriel. Angels in adoration also flank the central panel; the figures are painted on panels of mahogany on gold grounds, with raised diapers and ornaments. These accessories, together with the framework and carvings, are very rich and varied, no mouldings or carvings being repeated. The paintings are the work of Mr. N. H. J. Westlake, F.S.A. The pulpit is of oak, and is the offering of members of the old Dursley family of Vizard, as a memorial to their father and mother, and bears the inscription at the level of its floor:—"Ad : DEI : gloriam : et : in : memoriam : Johannis : et : Mariæ : Leigh : Vizard : 1888." It is octagonal on plan, and the traceries, panels, shafts, and mouldings are, like those of the reredos, very rich and varied. The cornice contains shields with various emblems of Our Lord's Passion, surrounded with rich carvings of the oak, vine, &c., the whole being supported on a central column, with eight shafts grouped round it. The backs to existing choir stalls (arranged to fit in with the beautiful new organ, the gift of Mrs. Eyre, of Kingshill, Dursley), and the desks to the subcellia are designed in harmony therewith, with traceries and columns having caps, zones, and bases, the whole crowned with a coved and moulded cornice; those on north side being the gift of



Mr. George Wenden, of Dursley. The three canopied stalls for the clergy are also designed in harmony with the stalls in the chancel, and are the gift of the rector and Mrs. Gresley. The whole of the works have been carried out from the designs and under the personal direction of Mr. E. Swinfen Harris, F.R.I.B.A., architect, of 32 Craven Street, Charing Cross, London, and Stony Stratford; the whole of the oakwork was done by Mr. W. R. Watson, of Stony Stratford, and the carving by Mr. Sewell, of St. Albans.

**Rishton, near Blackburn.**—The church of SS. Peter and Paul, Rishton, will be reopened on Sunday next (December 2), after an interval of nine weeks, during which it has undergone a thorough decoration. The work has been carried out, from drawings prepared by Messrs. Simpson & Duckworth, architects, Blackburn, by Messrs. Heighway & Son, decorators, Manchester, under the direction of the Church Committee. The vicar is the Rev. H. West, B.A. The general colouring is in light and warm tones, in harmony with the prevailing tints of the stonework. The nave and aisles are painted in light terra-cotta, with cream bands and stencilled ornaments, the transepts being more elaborately decorated. The decorations of the chancel are very effective. On the east wall are painted full-sized figures of the patron saints on gold ground panels; the wall under on each side of the reredos is hung with rich tapestry. The cost of the decorations is about 250/. A new organ has been erected by Messrs. Forster & Andrews, Hull, at a cost of over 600/.

### NEW BUILDINGS.

**Hotel Mont Dore, Bournemouth.**—The rapid growth of Bournemouth in popular favour and in actual size has induced the proprietors of the Hotel Mont Dore to carry out some important extensions and improvements, embracing the application of several of the most modern developments of engineering. At the west end a new wing has been added, containing a handsome dining-room capable of seating 100 guests, the upper floors being devoted to private suites of rooms. At the opposite extreme are a winter garden and a commodious covered tennis-court, fitted with a gallery at one end, and at the other a platform and organ, rendering the building available for concerts, &c. The whole of the hotel and recent additions are fitted with electric light, about 300 lamps being employed, ranging from eight to sixteen candles. The power is supplied by a 20 horse-power vertical engine and dynamo combined, of the well-known Raworth type, manufactured by Messrs. Browett & Lindley. The machinery has been supplied by the Anglo-American Brush Corporation, London, and the connections, lamps, and fittings, by Messrs. Edmundson & Co., of Westminster. An entirely new hydraulic lift service has been erected by Messrs. Archibald Smith & Stevens, of London, consisting of two of their patent "Reliance" lifts and requisite power machinery. One lift has an unusually handsome cage, in hard woods, with hand-painted panels and electric light. This conveys passengers to all floors, and is available at all hours. Having regard to the peculiar requirements of a hydropathic, special precautions have been employed to insure the silent running of the lifts, although the ascent may be made in eighteen seconds, and either car can make forty-eight complete trips up and down per hour. The pressure used is 700 lbs. per square inch, supplied through an accumulator by some specially-designed steam-pumps. These are of duplex type, with ram and bucket pump ends, and run with absolute silence. They are fixed at some considerable distance from the accumulator, necessitating some different system of automatic control from the chain arrangement usually employed. This is given by a very simple valve in the steam-pipe, in which the steam pressure is used in opposition to the hydraulic pressure, each being alternately caused to preponderate by hydraulic connection from the accumulator. The movement of the controlling valve is virtually invisible, with the result that immediately a lift at the far end of the building commences the ascent, the pump starts into motion by no visible agency, and continues working till the water consumed is replaced, when it stops in the same manner, only to restart at the next draught of water, the entire system being automatic and silent. Steam is supplied for the electric, hydraulic, and pumping machinery, and for heating and cooking purposes, by a 55 horse-power Babcock & Wilcox boiler, carrying a pressure of 90 lbs. Reducing valves are supplied for the cooking and heating systems. An independent water supply has been obtained by sinking a large well, about 16 feet diameter in the grounds. The quantity obtained is ample, and the quality all that can be desired. The water will be raised to tanks in the tower by a Worthington duplex pump. A separate pumping plant is employed to supply sea water direct from the shore, a quarter of a mile distant, to the baths. For this purpose a Crossley's "Otto" gas-engine is in use. With the improvements above enumerated, the Hotel Mont Dore should take front rank among the hydropathics and winter resorts of the country, and forms another example of the

ubiquity of the modern engineer. The work has been carried out under the superintendence of Mr. S. Chadwick, Parliament Street, Westminster, as architect, and Mr. K. Mackenzie, of 15 Great George Street, as consulting engineer. The builder was Mr. M'Williams, of Bournemouth, and the tennis-court was erected by Mr. Humphries.

### GENERAL.

**The Fourth Annual Exhibition** of the Aberdeen Artists' Society will be opened by the Marquis of Huntly.

**The Glasgow Exhibition** has produced a balance of 50,000/., out of which it is expected that both an Art Gallery for the city and a suitable building for the Mitchell Free Library will be provided.

**The Exhibition of the Water-Colour Society** will be opened on Monday.

**Mr. R. Beavis** has a collection of subjects from Spanish life exhibiting in the galleries of Messrs. Tooth.

**A Grand Exhibition** is suggested to be held in Leeds in the year 1890.

**A Stained-glass Window** is proposed as a memorial of the late rector of Warrington parish church, to be placed in the Asherton chapel.

**A Sum of 600/.** has been subscribed to the fund for the erection of a Burns statue in Ayr.

**A Carved Reredos** in white alabaster, designed by Mr. R. Knill Freeman, and executed by Messrs. Earp, Son & Hobbs has been erected in St. Anne's Church, Turton, which is being enlarged and improved under the direction of Mr. Freeman.

**Mr. David Petch**, architect, of Scarborough, died suddenly on Tuesday morning, it is believed from failure of the heart's action. The deceased gentleman had been connected with the town all his life, and had been the architect for many of the public buildings. He was sixty-six years of age.

**Messrs. T. Baillie & Co.**, of Wardour Street, have been awarded a gold medal for their "Valère Translucid Enamelling on Glass" by the jury of the Cardiff Exhibition.

Papers will be read at next week's meeting of the Royal Archaeological Institute on "The Shrine of St. Fridewide," by Mr. J. P. Harrison; and by Mr. Spurrell, on "The Crossing of the Thames by Plautius," "Hastings' Camp at Shoeburyness," "The Boat Discovered at North Woolwich."

**Professor H. G. Seeley, F.R.S.**, is about to deliver a course of lectures on the practical study of the geology of the country round London. This course is given at the request of students of the London Geological Field Class, and information concerning them may be obtained from Mr. William Dunn, 21 King William Street, Strand, W.C.

**The Council of the Sanitary Institute** can report that nearly five hundred members and associates have been enrolled. The Duke of Northumberland was elected President at the meeting on the 22nd inst.

**The Paris Bourse of Commerce** is to be lighted by electricity, and compressed-air engines will be used for motive power.

**Mr. J. Evelyn Williams** read a paper on "The Witham New Outfall Channel and Improvement Works" at the meeting of the Institution of Civil Engineers on Tuesday. The outlay was 212,000/.

**A Wesleyan Church**, to be erected in Bayswater, at an estimated cost of 5,000/., is suggested as a memorial of the late Sir Wm. McArthur, M.P.

**A Committee** has been appointed to obtain funds for carrying out works of restoration and alteration at St. Peter's Church, Worcester.

**Subscriptions** are being sought for a stained-glass window for the church of St. Mary the Virgin, Oxford, as a memorial of the late Dean of Chichester, who was formerly vicar of that church.

**A Site** has been obtained for building a new Roman Catholic church at Watford, to supersede the present building in Water Lane.

**Mr. Silvanus Trevail**, architect, is a candidate for a seat on the County Council for the eastern division of Truro.

**The Memorial-stone** of the Grand Theatre and Opera House, Halifax, was laid on Wednesday.

**A Bazaar** in aid of the building fund of a church for the new parish of St. Peter, Barnsley, was opened on Wednesday, by the Earl of Wharfedale.

**An "Autumn Market"** was opened in the Leeds town-hall on Wednesday, by the Countess of Harewood, the object being to raise the final 4,000/., required for the Hook Memorial Church.

**The Harbour Commissioners** of Bridlington Quay have decided to build a new landing stage of brick on the north side, on the ground occupied by the ruins of the old wooden pier, which years ago formed the outer pier of the then existing harbour.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, NOVEMBER 30, 1888.

## EDITORIAL NOTICES.

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## CONTRACTS OPEN.

AYLESBEARE.—Dec. 1.—For Building Board Schools. Mr. E. H. Harbottle, Architect, County Chambers, Exeter.

ALNWICK.—Dec. 1.—For Building Monumental Studio. Duke Street. Mr. George Reavell, jun., Architect, Alnwick.

BALTINGLASS.—Dec. 15.—For Building 10 Labourers' Cottages. Mr. J. R. Dagg, Clerk to the Guardians, Baltinglass.

BRADFORD.—For Building Children's Hospital. Messrs. H. & E. Marten, Architects, 29 Manningham Lane, Bradford.

BRISTOL.—Dec. 1.—For Building Shops and Premises for the Bristol and District Co-operative Society. Mr. Henry Williams, Architect, 28 Clare Street, Bristol.

CHEVINGTON.—Dec. 15.—For Additions, &c., to Board School, Red Row. Mr. William Webb, 23 Newgate Street, Morpeth.

CHILBOLTON.—Dec. 1.—For Building House. Mr. John Hillary, Architect, Longparish, Hants.

CLOUGHFOLD.—Dec. 13.—For Building Church. Mr. W. Wright, Surveyor, Lancaster.

DARTMOUTH.—Dec. 18.—For Construction of Pontoon and Approach Bridge, Waiting Rooms, Booking Office, &c. Mr. J. D. Higgins, Secretary, Paddington Station.

EARLSHEATON.—Dec. 10.—For Building Power Loom Sheds, Engine and Boiler-houses, and Long Chimney. Mr. F. W. Ridgway, Architect, Church Street, Dewsbury.

HASTINGS.—Nov. 30.—For Building Mixed School and Offices at Ore. Mr. F. H. Humphreys, Architect, 6 Trinity Street, Hastings.

HOWTH BAILEY.—Nov. 30.—For Building Boundary Wall, Gates, &c., at Lighthouse. Mr. Owen Armstrong, Secretary, Irish Lights Office, Dublin.

KESWICK.—Dec. 15.—For Additions, &c., to St. John's Church. Mr. William Marshall, Architect, 28 Bedford Square, London, W.C.

LANDPORT.—Dec. 4.—For Erection of Stands, &c., in Drill Hall, for the Annual Tournament. Mr. A. H. Bone, Architect, Hanover Street, Portsea.

LEEDS.—For Excavations for Building Extensive Clothing Factory. Messrs. Smith & Tweedale, Architects, 12 South Parade, Leeds.

LEIGH.—Nov. 30.—For Alterations to the Town Hall, for the Leigh Local Board. Mr. J. C. Prestwich, Architect, Leigh.

LEIGH.—Nov. 30.—For Painting, Paperhanging, Decorating at the Town Hall, for the Leigh Local Board. Mr. J. C. Prestwich, Architect, Leigh.

LEWISHAM.—Dec. 24.—For Works in connection with Colfe's Grammar School, for the Leathersellers' Company. Mr. E. Lyne Parsons, Architect, 236 High Street, Exeter.

LIVERPOOL.—Dec. 3.—For Reconstruction of Saw Mills, Drying Store, and Machinery. Messrs. T. George & Son, Old Square, Ashton-under-Lyne.

LONDON.—For Building the Pelican Club. Mr. Walter Emden, Architect, 105 Strand, W.C.

MALLOW.—Nov. 30.—For Building Labourers' Cottages. Mr. B. Williamson, C.E., Old Dromore, Mallow.

MANCHESTER.—Dec. 17.—For Building Library and News-room, Moss Side. Mr. W. R. Acton, Surveyor to the Local Board, Moss Lane East, Moss Side, Manchester.

NANTWICH.—Dec. 7.—For Laying Cast-iron Water Mains, &c. Mr. J. A. Davenport, C.E., 152 Hospital Street, Nantwich.

PONTYPRIDD.—Dec. 5.—For Building Arcade, with Shops, Cellars, &c. Messrs. Taylor & Evans, Architects, Cardiff.

SCRABLEY.—Dec. 3.—For Building Medical Officer's Residence. Mr. W. C. Higgins, Board of Guardians' Room, Granard.

SHEFFIELD.—Dec. 1.—For Taking Down Buildings and Erection of Stables, Clubroom, Shed, Storeroom, and Out-buildings to the Royal Exchange Hotel. Messrs. Senior & Clegg, Architects, 30 Regent Street, Barnsley.

SHIPLEY GLEN.—Dec. 1.—For Building Pair of Semi-detached Houses. Messrs. W. & J. B. Bailey, Architects, Keighley.

SKEGBY.—Dec. 5.—For Laying Water Mains, &c. Mr. George Hodson, C.E., Loughborough.

SLOUGH.—Dec. 13.—For Building the Leopold Institute. Mr. H. A. Cheers, Architect, Twickenham.

SWANSEA.—Dec. 5.—For Building Eye Hospital. Mr. J. Buckley Wilson, Architect, 15 Castle Street, Swansea.

## TENDERS.

### BANBRIDGE.

For Heating Bannside Church and Hall on the Efficient Small-pipe System.

EDWARD BOYES & Co., Liverpool and Newry (accepted).

### BLACKPOOL.

For Building Five Shops, Church Street, Blackpool. Mr. W. LONGLEY, Architect, Blackpool.

#### Accepted Tenders.

J. Moister, Blackpool, masonry . . . . .	£722	9	0
T. H. Smith, Blackpool, building . . . . .	284	10	0
J. Coulston, Blackpool, plumbing . . . . .	134	18	0
T. Walker, Blackpool, plastering . . . . .	45	14	0
Foster Bros., Preston, ironwork . . . . .	45	6	0
H. Thornton, Bradford, slating . . . . .	28	0	0
J. Black, Bradford, concrete . . . . .	17	10	0

### BOTCHERBY.

For Erection of Movable Wooden Church, Botcherby. Mr. H. HIGGINSON, Architect, 24 Bank Street, Carlisle.

H. Court, Carlisle . . . . .	£345	0	0
W. Court, Carlisle . . . . .	274	0	0
J. Forster, Carlisle . . . . .	258	0	0
J. Hindson, Carlisle . . . . .	245	0	0
J. REED, Carlisle, (accepted) . . . . .	239	15	0

### BECKENHAM.

For Supply of 100 Cast-iron Sewer Ventilating Lamp Columns and Street Lanterns, for the Beckenham Local Board. Mr. GEORGE B. CARLTON, Surveyor.

Watford Engineering Company . . . . .	£1,514	1	6
Pontifex & Co., Colman Street . . . . .	1,032	15	0
G. Smith & Co., Glasgow . . . . .	1,023	4	8
E. White, Reddish . . . . .	932	18	4
F. C. Barker & Co., St. Swithin's Lane . . . . .	958	15	0
J. Armer, Cannon Street . . . . .	907	3	4
J. Every, Lewes . . . . .	881	12	1
Newlove & Co., Nottingham . . . . .	860	5	0
J. Williamson & Co., Wellingborough . . . . .	797	18	0
Jukes, Stokes & Co., London . . . . .	779	8	4
Renshaw, King & Co., Kidsgrove . . . . .	720	17	0
A. Williams & Co., Bankside . . . . .	754	0	0
Engineer's estimate . . . . .	799	1	8



**BECKENHAM**—continued.

For Improvement Works, Church Road, Shortlands, for the Beckenham Local Board. Mr. G. B. CARLTON, Surveyor.

C. Dickson, St. Albans . . . . .	£827	14	6
W. & E. Iles, Wimbledon . . . . .	626	0	0
Peill & Sons, Bromley . . . . .	619	3	10
J. G. B. Marshall, Brighton . . . . .	608	11	10
W. Langridge, Croydon . . . . .	590	2	3
Woodham & Fry . . . . .	533	0	0
Mid-Kent Building Works, Beckenham . . . . .	448	12	5
T. Lansbury, Bromley . . . . .	447	5	7
R. Mayo, Brixton . . . . .	444	12	9
Surveyor's estimate . . . . .	499	3	10

**BOURNEMOUTH.**

For Waterworks for Public Pleasure-grounds, including Water Tower, Cast-iron Tank, Pipes, Hydrants, &c., Bournemouth. Mr. G. R. ANDREWS, Surveyor, Town Hall Chambers, Bournemouth.

F. Hoare & Sons, Bournemouth . . . . .	£926	0	0
H. J. Sanders, Southampton . . . . .	739	0	0
WOOD & Co., Bournemouth (accepted) . . . . .	715	14	10
J. Harrison & Son, Brighton . . . . .	700	0	0

**EAST HALTON.**

For Building Wesleyan Chapel, Schoolroom, &c., East Halton. Mr. RICHARD COULSON, M.S.A., Architect, 5 Bishop Lane, Hull. Quantities by Architect.

John Drury, Hull . . . . .	£1,098	0	0
Thomas Kendal, Hull . . . . .	1,070	0	0
T. Southern (Exors. of), Hull . . . . .	1,060	16	0
Davis & Hewitt, Barton-on-Humber . . . . .	997	14	0
E. Good, Hull . . . . .	965	0	0
Holmes & Horton, Wainfleet . . . . .	955	0	0
Joseph Leaming, Grimsby . . . . .	950	10	0
Colley & Levitt, Hull . . . . .	948	10	0
F. Grant, Cleethorpes . . . . .	914	0	0
F. Enderby, Grimsby . . . . .	907	18	0
J. Stamp, Barton-on-Humber . . . . .	890	0	0
Walker & Cook, Grimsby . . . . .	880	0	0
Thomas Siminon, Grimsby . . . . .	885	0	0
Benjamin Ashton, Saxby . . . . .	884	2	6
William Turner, East Halton . . . . .	862	0	0
J. WADDINGHAM, Habrough (accepted) . . . . .	850	8	3

**CROYDON.**

For Construction of Drying Apparatus at the Workhouse, Croydon.

Manlove, Hallet & Co., London . . . . .	£443	0	0
H. Twelvvetrees, London . . . . .	357	0	0
W. J. Fraser, London . . . . .	348	0	0
J. & F. May, London . . . . .	320	0	0
Bradford & Co., London . . . . .	253	0	0
Surveyor's estimate . . . . .	225	0	0

*Alternative Scheme.*

BRADFORD & Co. (accepted) . . . . .	262	10	0
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**DOVER.**

For Building Premises, Cannon Street, Dover, for Messrs. Wright Bros. Messrs. CRESSWELL & NEWMAN, Architects, Dover and Folkestone. Quantities by Architects.

W. Adcock, Dover . . . . .	£3,174	0	0
H. Stiff, Dover . . . . .	2,887	0	0
W. Paramor, Dover . . . . .	2,798	0	0
H. Richardson, Dover . . . . .	2,700	0	0
W. Dowle, Dover . . . . .	2,597	15	0
C. Gee, Dover . . . . .	2,550	0	0
Architect's estimate . . . . .	2,800	0	0

**HAMPTON-ON-THAMES.**

For Building Two Pairs of Semi-detached Villas, Hampton-on-Thames. Mr. NELSON JONES, Architect, Stamford Hill.

W. Hickinbotham, Teddington . . . . .	£2,335	0	0
A. Brichell, West Kensington . . . . .	2,330	0	0
J. H. Savage, Homerton . . . . .	2,025	0	0
R. Bushell, Sunbury . . . . .	1,840	0	0
C. Bonell, Teddington . . . . .	1,800	0	0
Henley & Co., Moorgate Street . . . . .	1,760	0	0
J. Piller, Teddington . . . . .	1,750	0	0
W. Littlefield, Enfield . . . . .	1,340	0	0
W. Pavey, Winchmore Hill . . . . .	1,300	0	0

**HAVANT.**

For Works in Forming Cricket Ground, for the Havant Local Board. Mr. A. C. LEWIS, Surveyor, West Street, Havant.

Silvester & Edwards, Portsmouth . . . . .	£669	0	0
Pinker Bros., Havant . . . . .	460	0	0
T. P. Hall, Portsmouth . . . . .	365	0	0
CARTER & DIDGUNS, Cosham (accepted) . . . . .	280	0	0
Surveyor's estimate . . . . .	271	11	0

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For Forming New Street at Hinckley. Mr. J. BALL, Surveyor.			
Hewitt . . . . .	£280	0	0
Ward, Rugby . . . . .	268	9	7
Bentley, Leicester . . . . .	257	19	9
Smith, Belgrave . . . . .	247	11	10
Grantham, Hinckley . . . . .	235	1	7

## IPSWICH.

For Constructing Shelter and Toolhouse in the Park, Ipswich. Mr. E. BUCKHAM, Borough Surveyor.			
R. Girling, Ipswich . . . . .	£170	0	0
A. Coe . . . . .	146	0	0
W. Harrison . . . . .	98	0	0
C. Borrett . . . . .	85	0	0

## KINGSTON-ON-THAMES.

For Improvement Works, Florence Road, Kingston-on-Thames.			
W. Cunliffe, Dorking . . . . .	£353	5	0
W. S. Kavanagh, Tolworth . . . . .	326	7	2
S. ATKINS, Kingston (accepted) . . . . .	320	0	0

## LEEDS.

For a One-storey Building in Meadow Lane, Leeds. Accepted Tenders.			
W. & G. Purdy, builder . . . . .	£224	18	0
J. W. Pease, joiner . . . . .	150	0	0
F. Dyson, ironfounder . . . . .	90	15	0
A. Stephens, plumber . . . . .	85	14	0
G. Milner, slater . . . . .	30	5	0
Greenwood Bros, painter . . . . .	12	0	0

## LONDON.

For Construction of Corrugated Iron Shed, Mile End Wharf, for the Vestry.			
Crogen & Co. . . . .	£346	0	0
Norton & Co. . . . .	280	0	0
Humphreys . . . . .	275	0	0
Lye . . . . .	234	10	0
Mallett & Co. . . . .	225	0	0
Whitford & Co. . . . .	197	0	0
Constructional Ironworks Co. . . . .	187	10	0
W. GLOVER & SONS (accepted) . . . . .	143	0	0
Surveyor's estimate . . . . .	110	0	0

## LONDON—continued.

For Building Public Library at Corner of Harrow Road and Fourth Avenue, Kensal Town. Messrs. KARSLAKE & MORTIMER, Architects, 5 Great Queen Street, Westminster.			
M. Bax, Mount Grove Road . . . . .	£4,315	0	0
J. Munday, Wimbledon . . . . .	3,400	0	0
Perry & Co., Bow . . . . .	3,348	0	0
J. Shillitoe & Sons, Bury St. Edmunds . . . . .	3,312	0	0
Staines & Son, Great Eastern Street . . . . .	3,225	0	0
Peto Bros., Pimlico . . . . .	3,219	0	0
B. E. Nightingale, Albert Embankment . . . . .	3,190	0	0
Ward, Clarke & Co., London . . . . .	3,166	0	0
F. T. Chinchin, Harrow Road . . . . .	3,150	0	0
W. F. Picken, Chelsea . . . . .	3,127	10	0
R. G. Battley, London . . . . .	3,064	0	0
W. Dabbs, Stamford Hill . . . . .	3,050	0	0
W. Brass & Sons, Old Street . . . . .	3,040	0	0
N. Lidstone, Finsbury Park . . . . .	3,030	0	0
Stimpson & Co., Brompton . . . . .	3,030	0	0
C. Simmons, Harlesden . . . . .	2,989	0	0
C. Wall, Chelsea . . . . .	2,983	0	0
Prestige & Co., Pimlico . . . . .	2,982	0	0
Whitehead & Co., Clapham . . . . .	2,950	0	0
J. Allan & Sons, Kilburn . . . . .	2,945	0	0
C. Kynoch & Co., Clapham . . . . .	2,928	0	0
J. Derry, Clapham . . . . .	2,898	0	0
A. Brickell, West Kensington . . . . .	2,845	0	0
F. & H. F. Higgs, London . . . . .	2,800	0	0
W. Oldrey & Co., Westbourne Park . . . . .	2,794	0	0
W. L. KELLAWAY, Pentonville (accepted) . . . . .	2,573	15	0

For Road-making and Paving Works in New Road from Hammersmith Road to Elm Gardens.

E. Rogers & Co. . . . .	£399	0	0
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T. Adams . . . . .	858	0	0
Neave & Son . . . . .	840	0	0
Nowell & Robson . . . . .	782	0	0
W. G. Coat . . . . .	779	0	0
Woodham & Fry . . . . .	772	0	0
TOMES & WIMPEY (accepted) . . . . .	746	0	0
G. Neal & Son . . . . .	740	0	0

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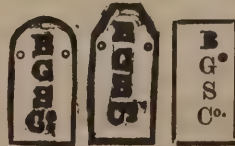


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Marriage	1,440 0 0
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For Alterations and Additions to General Offices in Dale Street, Manchester, for the Rochdale Canal Company. Mr. WILLIAM OWEN, A.R.I.B.A., Architect, 134 Deansgate.

James Hamilton, Bowdon . . . £370 0 0

W. Southern & Sons, Salford . . . 328 0 0

George Macfarlane, Manchester . . . 314 0 0

OWEN WILLIAMS, Manchester (accepted) . . . 276 0 0

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For Building, Villa, Newmilns, Ayrshire. Mr. JOHN MACINTOSH, Architect, Galston, Ayrshire.

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A. Falconer, plasterer . . . 130 4 4

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T. & H. Herbert	1,634 0 0
N. Elliott	1,634 0 0
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For Additions to and Alterations of Bait House into Clothing Factory. Messrs. SWALE & MITCHELL, Architects, 98 Albion Street, Leeds.

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T. Chapman, Otley, painter.

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R. Bearpark, Sunderland . . . 1,029 0 0

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J. Elrick, Sunderland . . . 1,018 0 0

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P. Conroy, Ballinrud	500	0	0
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Butters & Carson, Manchester	1,269	0	0
J. Spark, Urmston	1,265	19	0
Wm. Moore, Eccles	1,250	0	0
George Macfarlane, Manchester	1,245	0	0
OWEN WILLIAMS, Manchester (accepted)	1,219	0	0

Slaughter House and Stables in Connection.

Jas. Hamilton, Altrincham	110	0	0
Adam Fox, Bowden	109	0	0
OWEN WILLIAMS, Manchester (accepted)	104	0	0
Butters & Carson, Manchester	100	0	0
George Macfarlane, Manchester	99	0	0
J. Spark, Urmston	92	0	0
Wm. Moore, Eccles	82	10	0

WEYMOUTH.

For Alterations and Additions to the Weymouth Workhouse and Premises, and Erection of other Buildings. Mr. ROBERT CHRISTIE BENNETT, S.A., Architect, Weymouth. Quantities by the Architect.

J. A. Bartlett, Weymouth	£4,316	0	0
McWilliam & Son, Bournemouth	4,302	0	0
Davis & Son, Dorchester	3,991	0	0
John J. Patten, Portland	3,981	0	0
John T. Whettam, Weymouth	3,965	0	0
John Innes, Weymouth	3,884	0	0
A. Krauss, 40 Colston Street, Bristol	3,875	0	0
A. Clarke, Weymouth	3,846	0	0
James Purchase, Weymouth	3,656	0	0
BROWN BROS., Weymouth (accepted)	3,536	0	0

TRADE NOTES.

THE operative plumbers of Glasgow and district held their thirty-fifth annual reunion in the Waterloo Rooms, Wellington Street, on Friday evening—Mr. John Speirs presiding—when a large number of members and their friends were present.

THE reports as to the steadiness with which the Tay Bridge withstood the recent gales are confirmed in the strongest manner by the engineer in charge of the bridge. In the report to the railway authorities in Edinburgh he states that the bridge withstood the shocks of the gale without shake or tremble. During the most violent period of the gale, between nine and ten o'clock on the morning of the 16th inst., there was no perceptible difference in the stability of the structure, and even when trains were passing and the wind had all the advantage it could possibly get the bridge stood like a rock.

THE old parish church of Charbury has just been warmed on the small-bore system by Mr. John Neville, of 1 Upper Charles Street, Goswell Road, E.C. The vicar, the Rev. C. F. C. West, writes that, although the church contains 125,000 cubic feet of space, the temperature was raised within two hours after the fire was lighted.

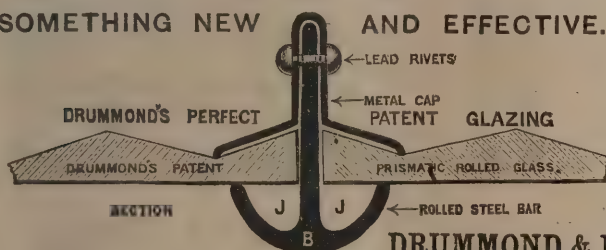
MESSRS. WATERLOW BROS. & LAYTON, Limited, have been awarded a gold medal for their exhibits at the Cardiff International Exhibition.

A SUM of 350*l.* is to be raised for heating the parish church of Quinton, and carrying out works of renovation.

THE Nonpanton Mission Room, Loughborough, has been warmed and ventilated by means of Shorland's patent Manchester stove, supplied by Mr. E. H. Shorland, of Manchester and London, Mr. A. A. Butler, of Loughborough, being the architect of the building.

FROM the report for the year ending September 29 last of the superintendent of the Manchester Fire Brigade, it appears there have been 426 fires, 30 of which were classed as serious, where more than one-sixth of the property was damaged or destroyed. The total loss was estimated at 64,865*l.*, and 1,482,140*l.* was assessed to have been at risk within the walls of the premises on fire. Thirty-seven fires were attended within the limits of the fourteen districts protected by the Corporation fire brigade. At these fires the total loss was estimated at 7,113*l.*, and 103,421*l.* was assessed to have been at risk. As

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that the cost of plant for manufacturing water gas at Hawes would be about 1,350*l.*, and about 300*l.* would cover the cost of piping necessary for its distribution. If 500 lights were in operation, he believed that on their principle gas could be supplied at 3*s.* 6*d.* per 1,000 feet. A deputation was appointed by the meeting to go to Leeds Forge and report to a future meeting their opinion on the practical working of water gas.

THE question of compensation for damage sustained by the property-owners of Cradley Heath by extensive subsidence on July 1 has been settled without taking it into court. The proprietors of the colliery responsible for the damage (Messrs. Parsons & Cooper) have agreed to pay 2,500*l.* to the Property-Owners' Committee, and also 200*l.* for legal expenses. This will be divided amongst the owners who suffered damage by the committee. It was estimated that the total damage caused by the subsidence was about 10,000*l.* The Primitive Methodist Chapel at Cradley has also recently been damaged considerably by mining operations, and the owner of the colliery (Mr. Swindell) has paid to the trustees of the chapel 200*l.*, and undertaken to do the cramping necessary for the stability of the building.

THE foundation-stones of new extensive buildings to be erected, at a cost of about 7,000*l.*, in Free School Lane, Lincoln, by the Lincoln Co-operative Society, have been laid.

MR. EDWIN PEAKE, hot-water engineer, of High Street, Fenton, is the manufacturer, as also the inventor and patentee, of an improved system of high-pressure hot-water heating on the small-bore principle. The apparatus consists of a coil of pipes of very small diameter, containing a very small body of water, is subjected to a fierce fire, and the water soon becomes heated to a temperature far beyond boiling-point, at exceedingly high pressure. This thin stream of water is conducted round a building, and is capable of raising sufficient heat in the coldest weather.

#### REGISTRATION OF PLUMBERS.

AT the examination of plumbers for registration on Saturday, at the Guilds' Institute, applicants were present from various parts of London, as well as from towns of Kent and Essex. The examinations embraced tests of joint-making, lead-laying, &c., and a set of questions relating to the qualities of materials, the construction of various forms of house-fittings, and

the principles of sanitation. The examiners were Messrs. C. Hudson, C. T. Millis, J. C. Ashdown, G. Davis, and L. F. Gilbert, the last representing the United Operative Plumbers' Association. One-third only of the applicants succeeded in passing the examination.

#### AMERICAN BLAST-FURNACE PRACTICE.

ON Saturday night a meeting of the South Staffordshire Institute of Iron and Steel Works Managers was held at the Mechanics' Institute, Dudley. Mr. Hudson, of Woodside Iron-works, read a paper on "American Blast-furnace Practice." The author, after referring to the great development of American blast-furnace practice during recent years, the leading and most striking feature of which is the enormous quantity of pig-iron which is being made from individual furnaces, spoke of the disadvantages under which South Staffordshire as an inland area suffered. With heavy railway and canal rates such as the manufacturers have to contend against, economy must be pursued, not only in rolling-mills, but also at blast-furnaces from which these mills derive their supply of pig-iron. He contended that the only hope of maintaining an increased volume of trade rests on the ability to produce cheaply. One important factor of economy is the spreading of fixed charges over a large production. He then proceeded to explain that American rapid blast-furnace practice depends in the main upon three important conditions, viz., rich iron ore, favourable working-lines of construction, and highly compressed air. Analyses of American iron ores were quoted, and it was stated that frequently the charges of ore contained an average of 60 per cent. of iron. In comparing the sections of American furnaces, the most striking feature that presents itself at first sight is that, in comparison with height, the top of the bosh is not nearly so wide as in English practice, while the hearth is much wider. These features give greater area at melting temperature, afford easy descent of materials, and greatly facilitate the proper diffusion of ascending gases. The liability to forming scaffolds is reduced to a minimum. Blast pressures of from 8 lbs. to 10 lbs. per square inch are employed in America against pressures of from 3 lbs. to 5 lbs. in England. Nearly all American furnaces are worked with closed hearths and tin-fires evenly spaced all round. Hot blast from firebrick stoves of the Cowper or Whitwell type is employed, and driven into the furnace through bronze tin-fires placed very much higher

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It is perfectly innocuous and free from smell. It will keep any length of time. Any one can apply it. One gallon will cover double that of any other priming.

All Woodwork in new houses should be fireproofed with this liquid, the cost is so trifling in comparison with the preservation of the timber and freedom from risk of fire. If work is desired to be painted afterwards, Griffiths' Pyrodene Paint is best for the purpose.

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#### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 2*d.*, 1887.

DEAR SIR.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 33 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIR.—In reply to your inquiry, we, as one of the contractors for the painting of the Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly, S. C. LOWE & SON.

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above the floor than in English practice. Furnaces belonging to the Edgar Thompson Company and the North Chicago Rolling-mill Company, and others, were described. The production of pig-iron at the first-named was said to be from 1,800 to 2,000 tons per week, with a fuel consumption of about one ton of coke per ton of pig-iron. The Chicago furnaces produce from 1,400 to 1,500 tons per week, with less than a ton of coke per ton of iron. These furnaces run about two years, and make from 150,000 to 200,000 tons of iron before they are blown out for repairs. The Franklin furnace was also described, the leading feature of which was the remarkably low bosh. The furnace was described as having done very good work on a mixture of anthracite coal and coke as fuel.

#### THE SWEDISH TIMBER TRADE.

A SWEDISH journal states that, in consequence of the unusual number of vessels which have visited the Swedish ports of the Baltic this autumn in search of cargoes, and of the consequent fall in freights, most merchants who are accustomed to warehouse their unsold goods through the winter are taking advantage of the unusual opportunity to ship them at once. A natural result of this has been an increased animation in the timber trade, but it appears that this has already been overdone, and the latest reports from the timber market of the Baltic ports state that things are very quiet again.

#### ENGINEERING AT THE CARDIFF EXHIBITION.

MESSRS. HENRIE H. RAYWARD & CO., engineers, boilermakers, iron and brassfounders, of Cardiff, have a representative show at the Exhibition. Amongst their exhibits are driven-tube wells for obtaining supplies of water not only for temporary purposes, for which they are particularly adapted, such as building, railway construction, ascertaining water-levels for drainage and other works, &c., but for obtaining permanent supplies for houses, farms, villages, breweries, &c. A well driven in the grounds there is 40 feet deep, and is capable of delivering 1,000 gallons of water per hour. The special feature of these wells is the wonderful rapidity with which they may be put down, a well being often driven and pump set to work in an hour or two. The water obtained, too, is usually a great deal purer than that from open wells, as surface water is prevented

from percolating in and contaminating it. In connection with this a number of constant-supply silicated carbon filters are shown, the merits of which are too well known to need description.

#### BOLTON MASTER BUILDERS' ASSOCIATION.

THE annual meeting of the members of this Association was held on Wednesday in last week. Mr. Henry Critchley, president, occupied the chair. Mr. Briscoe, the secretary, read the annual report, as follows:—

The trade during the past year has not been a busy one, and the scarcity of work given out has resulted in diminished profits. The long-looked-for revival in trade has not yet arrived, and consequently the employers feel the continued strain severely. During the past year there has been little to report in respect to any difference between masters and workmen. In the carpenters and joiners' branch a claim to two hours' allowance for "sharpening time" has been made, but as it is not in accordance with the custom of the trade, and is not named in the rules, an interview is sought to be obtained between masters and workmen to discuss the matter. In the plumbing branch the peremptory action of the Bolton Waterworks Committee in seeking to abolish the use of boilers behind the fireplace without the intervention of a cistern, called forth efforts to bring about a check to this unreasonable resolution. To effect that object a circular was issued to each member of the Council, stating the case of the plumbers, and the result was that at the Council meeting the matter was referred back for consideration, and expressions were used by the members of the Council at the unfairness of adopting such a change without notice to enable the plumbers to complete work already in hand. The Employers' Liability Amendment Bill, the Steam Engines (Persons in Charge) Bill, and the Rating of Machinery Bill have been discussed, and a subscription was voted to the National Association towards opposing these Bills. The former Bill was postponed for a time, and the other withdrawn. At the half-yearly meeting of the National Association, held on January 23, at the Builders' Institute, London, this Association was represented by the president, treasurer, and secretary. Particulars of the meeting have already been distributed amongst the members. At the half-yearly meeting of the National Association, held at Liverpool, on July 23, the representatives of this Association were the president, vice-president, treasurer, Mr. Gregson, Mr. Dickin-

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# CURE.



son, and the secretary. The meeting was of a general character. The various questions affecting the trade throughout the country were touched upon, and the report and accounts were submitted and passed. In the evening members were hospitably entertained, and on the following day a special excursion was made up the river and over the works of the Manchester Ship Canal from Eastham to Ellesmere Port. The question of railway wharfage, as referred to in the last report, has not yet resulted in any settlement, the claims of the railway companies being objected to by the timber trade connected with this Association, and recently nothing has been heard further of the matter.

The following members were elected as committee for the ensuing year, viz.:—President, Mr. William Townson; deputy-president, Mr. Henry Critchley; vice-president, Mr. Pryce Weaver; treasurer, Mr. J. Henry Marsden; on the committee, three representatives from each of the following branches of the building trade were also appointed, viz.:—Carpenters and joiners, bricklayers, plumbers, slaters, plasterers and painters, and masons. Messrs. James Gregson and George Norris were appointed auditors for the ensuing year. The annual dinner of the Association is to be held in December.

#### THE PLUMBERS' COMPANY.

THE Master, Wardens, and Court of the Worshipful Company of Plumbers entertained on Monday evening the Lord Mayor and the Sheriffs, together with a select company, at a Livery dinner, at the Saddlers' Hall, Cheapside. Mr. W. H. Bishop (the master) presided, and amongst the company, which numbered about 120 gentlemen, were the Earl of Denbigh, Sir M. E. Grant-Duff, Sir R. Fowler, M.P., Sir Hugh Owen, Captain Colomb, M.P., Mr. C. Murdoch, M.P., Sir Andrew Clark, Sir Reginald Hanson, Sir E. Arnold, Sir Philip Magnus, Sir Douglas Galton, Mr. Digby Seymour, Q.C. (Renter Warden), Mr. Ewan Christian, Mr. Seth Smith, Mr. Clark, and other members of the architectural and engineering professions, Mr. T. Bent, vice-president of the United Operative Plumbers' Association, the Mayors of several towns, and the Sheriffs (Mr. Alderman Gray and Mr. A. J. Newton). The Master proposed the usual loyal toasts, which were drunk with great heartiness. Lord Denbigh responded for the House of Lords, and Sir R. Fowler, M.P., for the House of Commons.

In proposing the health of the Lord Mayor, the Master, who

began by referring to the early history of sanitary science, said that Mr. Ruskin in his beautiful little volume called the "Bible of Amiens," with the wonderful artistic skill of which he was a master, associated with an edifice already beautiful the adornment of his imagination, and asked the question, "Who built this house?" The same thing might be asked of that guild, which dated back 500 years. As to the work of the company in regard of sanitary reform, the Master said in the metropolitan area in the period between 1854 and 1864 the increase of houses was 88,112; 1864 to 1874 it was 141,472, and 1874 to 1884 it was 190,841. In the period from 1854 to 1864 there were 28 new houses built every day, from 1864 to 1874 45 houses, and from 1874 to 1884 60 houses. At such a rate of increase as that, what was the need of sanitary and other arrangements connected with the water-supply and the health of this vast city? It was impossible to read the report of the Congress of London and Provincial Plumbers of 1884 without being convinced that in the belief of the plumber his work was not being carried out efficiently, and now they had a union of three interests—the general public, the master plumbers, and the operative plumbers—all working in complete accord. One of those who took part in the Plumbers' Congress struck the right chord when he said the general public, who thought they had just cause of complaint against the plumbing trade, were not aware that they did not design their own work, but were in reality carrying out other people's ideas of sanitation, which were not deserving of the name of ideas. The Congress also decided that in its opinion the registration of master plumbers and journeymen was expedient. In 1886 that company opened a list for the registration of plumbers. In the session 1886-7 they had 580 applicants; 1887-8, 730; and in the current session 2,740, of which about 1,000 were received since July. Many facts pointed to the need of such a system of registration. It might be interesting to the Lord Mayor to know that in some of the examinations as many as 75 per cent. of the applicants had failed to pass. At the present time district councils in connection with the Plumbers' Company were in operation in Northumberland, Durham, Cumberland, Westmoreland, the North Riding, Liverpool, Birkenhead, West Lancashire, Cheshire, Denbigh, Flint, Carnarvon, Anglesea, Manchester, and Sussex. In Scotland there were district councils in Glasgow, Edinburgh, Forfarshire, Fifeshire, Aberdeenshire, Inverness, Dumfriesshire, Wigtownshire, and Kircudbrightshire. District

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councils were also in process of formation at Portsmouth, Southampton (for Hampshire and the Isle of Wight), Cardiff and South Wales, Bristol and the West of England, Plymouth, Devonport, Leicester, Nottingham, Hull, Leeds, Dublin, and Belfast. He had just had placed in his hand a statement of great importance to them, that it was intended in all future buildings on the Grosvenor estate only to employ registered plumbers. In proposing "The Health of the Lord Mayor," he said they looked to his lordship as the chief representative of our municipal institutions for encouragement and support. The Lord Mayor, in reply, observed that the great want of the present day was more perfect sanitation; and he ventured to believe that if the Plumbers' Company were supported, as they deserved to be, in their present efforts by the other rich companies, they would effect, in the long run, a great improvement in sanitation. Other toasts followed.

#### MORTARS AND CONCRETES.\*

Up to the middle of the eighteenth century, puzzolanas, imported from Italy and France, from Germany *via* Holland, were the standard ingredients for hydraulic mortar in England. About 1756 the Eddystone lighthouse was consumed by fire. John Smeaton, entrusted with the erection of a new structure, searched for native materials for a mortar which was to resist the action of surf and sea. The lime from Aberthaw answered his purpose best. He investigated the cause, and proved before long that but those limes resist the water which, when treated with acids, leave argillaceous residues.

In the year 1796, Parker introduced a product burned of lumps of chalky clay from the English coast, and called it Roman cement, because its colour resembled Roman puzzolana. The inference followed that hydraulic cements might be produced artificially of lime and clay. Consistent efforts revealed to M. Vicat, the French chemist, the due combining proportions and temperatures of calcining for a hydraulic cement which was, about the same time, empirically invented by Joseph Apsidin, an English mason. After trials with waste clinkers, under Parker's process, he pulverised the calcareous detritus produced by the wear of the limestone roads near Leeds, mixed clay with it, and burned it in a kiln, at red heat. He

\* From a paper by Mr. Adolph Cluss, architect, read at a convention of the American Institute of Architects.

called it Portland cement, since it resembled the Portland stone in colour.

About the year 1827, Sir Charles Pasley, a conscientious investigator, improved and cheapened Apsidin's process by selecting the English chalk, an uncrystalline, fine-grained, earthy, porous limestone, of little cohesion, as best suited for manufacturing the cement. He mixed it with clay from the deposits at the mouth of the Medway river, near Chatham, and calcined them. The special merits of calcination at white heat were then not known, so that quality could not be relied upon.

In the year 1828, Professor Fuchs, of Munich, formulated the first scientific theory of the action of hydraulic limes, and proved in a prize essay that Portland cement, which, so far, had been a secret of a few manufacturers, might be produced anywhere, from a variety of materials. For want of successful competition, the manufacture was carried on empirically for many years more; hence the cement lacked uniform quality, the elements of progress, and brought but low prices. Many wrecks are of record where Portland cement had acted mischievously, so that engineers and architects had no confidence in it, on account of supposed treacherous qualities. The new material dragged along with scanty recognition until, in 1858, John Grant, by experiments and adherence to a system of details, enabled the London drainage works and the Thames Embankment to be carried on, unerringly, as to good quality of the cement. The standard was now gradually raised and reduced; but this pioneer's experiments were of necessity incomplete. Owing to local causes, it appeared that by adding to the weight of the cement, its tensile strength was largely increased. From this, unfortunately, the basis was reduced, that great weight was more desirable than fine grinding.

Grant's merits and high standing caused his dictum to remain unquestioned long after experiments had pointed it out as a fallacy. The labour of Reid, Mann, Newman and others in England; Michaelis, Banschinger, Dyckerhoff, &c., in Germany; of Zurek and Hanenschild in Austria, and the valuable tests of the late General Gilmore, U. S. E.; W. W. Maclay, Eng. of the N.Y. depot of docks, 7,000 tests; Eliot C. Clarke, of the Boston Main Drainage Works, 25,000 tests; E. J. Desmith, of Washington, and others have reversed the fallacious doctrines. The importance of fineness is recognised, and we command brands of uniform quality, which equal the strength of good building stone.

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because a great variety of raw materials produced an approximately equal quality of cement, provided that each is individually treated and mixed. Still the chemistry of the silicates is yet undeveloped. The observations and conclusions of leading experts conflict sometimes, and neither contestant may be in a position to adduce strict proofs. I have therefore endeavoured to condense from the scattered information such largely accepted facts and theories as tend to direct the attention of the busy architect to the vital points at issue.

*Ingredients, Classifications and Properties of Mortar.*

The principal ingredients of rich mortars, the cementing substances and carriers of plasticity required for the setting of hydraulic mortars and cements, are the limes. The dense limestones, fine-grained, crystalline rocks, chemically called carbonates of lime, form the standard material for the mortar industry. By calcining different limestones, rich or fat limes, hydraulic limes and cements are obtained. In modern practice pure lime mortars are considered as secondary building materials of scanty resistibility formed under unfavourable conditions. Normal mortars are to contain combinations of lime with silica and other bases, approaching the strength of bricks and stones; these rank as primary materials of construction. Good mortar is to have plasticity when mixed with large doses of sand and after solidification compressive strength; tensile strength, as evidence of independent cohesion and force to defy frost and heat; adhesive power for cementing blocks to monolithic bodies. It is to be invariable in volume during and after solidification, to be weather proof, and for hydraulic works also water tight. All mortars are generally mixed with sand. It imparts crushing strength, lessens shrinkage and saves expense in lime mortars.

Hydraulic cements require sand only at exposed surfaces. Otherwise it serves as an adulteration for reducing a surplus of strength and density to actual requirements of a given bulk. The sand should be clean, sharp, large grained, not too uniform in size, free from loam, well screened, and, if necessary, washed. Admixed particles of clay adhere to the sand and form diaphragms between sand and mortar, which for durability require close contact. Puzzolanas are pulverised volcanic rocks, composed chiefly of soluble silica, alumina, iron, and small quantities of lime. They produce hydraulic mortars when mixed with lime instead of ordinary sand. Where better material is scarce, pulverised bricks and similar materials form weak artificial puzzolanas.

Since sand is mostly used in greater quantities than the cementing substances, it equals them in importance. It is in all cases embedded in the matrix as a mechanical mixture. Tensile and crushing strength of the same cement with equal doses of different qualities of sand vary more than those of different brands of cement, within the same group, do among themselves. In slacking limes or mixing cements, a certain quantity of water must form, with the solids, chemical combinations called hydrates. An additional quantity is necessary for imparting plasticity to the paste, and evaporates again during the hardening, hence a too lavish use of water renders the mortars porous. Clear rain or river water is best suited, since waters from wells or springs is often impregnated with carbonic acid or other deleterious substances. Natural cements require more water than Portland, fine ground more than coarse, and quick-setting more than slow-setting cements.

The lime mortars solidify by evaporation and pressure. Induration proceeds slowly from the surface inward. The cement mortars enter the chemical combinations promptly, in proportion to and with the energy depending upon the materials which are already formed by the process. They set by a physical and chemical process, while reaction begun by the agency of heat is perfected by the action of the mortar. As soon as the combinations are accomplished, creative activity is confined to secondary formations. Induration goes on at once simultaneously through the whole mass, but hardens, and strength increases for variable periods. An often mooted question related to the subject under discussion may here be alluded to, Is it safe to use cement on the second set? Cement having set before use in the pan or on the mortar board is probably not damaged chemically when plasticity is restored by new additions of water, but its density will be lessened, and, in consequence, its efficiency. However, for a day or so, as long as the water has not been evaporated or absorbed, these bad effects may be obviated by simply beating, manipulating and stirring the congealed mortar with a minimum of water, when a mortar of little hydraulic energy, but slow and sure increase of density, will finally result. Extra exertion on the part of the mortar men is indispensable for the success of this makeshift. Shrinking mortars are and have been prolific sources of disasters in walls faced with thin jointed materials and backed with material having heavy mortar joints.

The adhesive or cementing power with masonry is a most important requisite of mortar. Until lately this was and is still largely the dark horse of the mortar theories. Mann has asce

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tained, by 1,200 special tests, that pure Portland cement of 425 pounds tensile and 5,600 pounds compressive strength per square inch has but 60 to 80 pounds adhesive strength to limestone, and that the proportion of tensile to adhesive strength varies from 9:1 to 5:1. In fact, these are different things which bear no comparison, while tensile and compressive strength being based upon physical attraction between homogeneous molecules, the adhesive power is formulated under a different physical law. Hanenschild has for years investigated it, and finds that it is largely based upon the adhesion of contiguous surfaces, intensified by an intermediate moistening fluid of glutinous consistency, which brings about the transition from apparent to real adhesion. With absolute tight contact, the resistance to separation would be infinitely great; it decreases with the square of the distance between the surfaces, and differs in tensile for heterogeneous plates of equal weights and sizes, or for dissimilar liquids. Both fat lime mortar, as well as Portland cement mortar, resemble glutinous substances, but under the microscope the first shows an emulsion of minute swelled, moistened globules in partial solution; while the second appears as a mixture of semi-vitreous swelled scales separated by water.

#### Natural Cements.

Limestone with intimate, fine-grained admixture of silica, alumina, magnesia, &c., in quantities of 35 to 60 per cent., is called cement stone. The high percentage of silicates causes a separation of the alumina from the silica during calcination at red heat just sufficient to expel the carbonic acid. Oxides of iron and chlorites of potash are generally present in small quantities; they assist hydraulicity and crystallisation. A cement of porous, friable, globular texture, with a specific gravity of 2.7 is obtained; it contains silica and alumina in soluble state, and hence the lime can easily act on either, according to affinity, when water is added for mixing and hydration. The burned lumps must be pulverised before they will combine with water, when they form hydrated silicate of lime, while the alumina remains practically inert. These cements do not heat up nor swell sensibly whilst they are mixed; they set quickly, but harden slowly under water without shrinking, and attain gradually great strength with well developed adhesive force. The colour of these cements gives no clue to their actual value, since it is chiefly due to oxides of iron and manganese, which bear no relation to hydraulic properties.

To insure efficient chemical action in hardening, the grinding

must be carried to the production of impalpable powder. These cements bear doses of sand of double their own volume or over. Mixing pure cements, from 30 to 40 per cent. of water must be added.

Many causes co-operate in affecting rocks of the compound character, required for the production of hydraulic cements. Deleterious material is disseminated through the various strata of a quarry in constantly and widely changing proportions; each stratum exhibits heterogeneous features, hence it taxes judgment begotten of large experience, honesty, carefulness and skill to keep up reasonable uniform quality. Different quarries show dissimilar stones; the best brands vary greatly in chemical composition. Fineness, density, thorough and homogeneous mixture, humidity, accessory ingredients, enter largely in the problems. To preserve the activity and strength of the natural cements for a longer time, air and moisture must be excluded by careful packing and dry storage of the barrels, otherwise the premature production of carbonate of lime will interfere with subsequent hydration.

#### Natural Portland Cement.

Natural Portland cements are manufactured in those rare cases where rocks are traced which contain combinations of lime and silicate of alumina in the chemical proportions and physical conditions found necessary for producing artificial Portland. The treatment then differs from that of ordinary cement only in the higher temperature for burning. There are extensive works of this class around Perlmoos in Germany, Grenoble in France, &c.

#### Artificial Portland Cement.

Most of the progressive governments and organised bodies of architects and engineers of the world have been, within the last decade, taking action on the material. The artificial Portland cement of commerce is a product in which pulverised chalk or limestone is intimately mixed with such a quantity of pulverised clay as will produce, when calcined at white heat, vitreous but not entirely melted clinkers, which, when pulverised and hydrated, harden under water. Being entirely under the control of the manufacturers, the Portland cements are less variable than the natural cement.

According to Dr. Michaelis, the foremost cement expert now living, the raw materials, when dried at 212 degrees Fahr., consist essentially of 75 to 79 per cent., by weight, of carbonate of lime, and 24 to 29 per cent. of silicate of alumina, clay.

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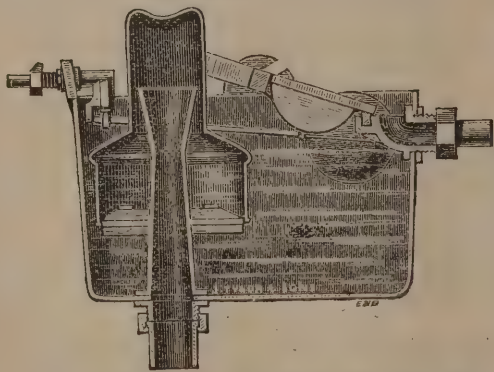
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These, when burned, represent 62½ to 67 per cent. of lime and 33½ to 29 per cent. of silicates, silica, alumina, oxide of iron, leaving 4 per cent. for accessories. After the hardening of the hydrated cement a transformation by complicated reaction has taken place into hydrates, silicate of lime as the most important ingredient in hydrated aluminate of lime, ferruginous lime, hydrate of lime, basic sulphate of lime and carbonate of lime. Microscopic examinations of other investigators do not conflict with this analysis. During the calcination, alumina and oxide of iron, which acted in the clay as bases, assume the rôle of acids towards the lime, the calcinated oxide of iron acting as flint in the fire. A preponderance of alumina favours quick setting, while an increase of iron has the opposite effect. The ingredients being pulverised are mixed into a homogeneous paste, baled, dried and burned by exposure to a quick white heat, equal to the melting-point of wrought-iron. This causes, first, the expulsion of the chemically bound water and carbonic acid, and next a softening of the whole mixture.

When partial vitrification sets in, the heat is to be promptly stopped, since a higher heat or a continued, oxidising heat of the normal temperature will ruin the cement, which now requires rapid cooling as much as it did a quick heat before. At this stage the sifting lime is allayed with the softened clay, while neither is in fusion yet. A disposition for the formation of new combinations of lime, with silica, alumina, oxide of iron, &c., is induced without allowing these nascent combinations to be fully consummated, because they, as crystalline bodies, would impede the subsequent hydration and the dense interlocking of the molecules during the setting, crystallisation, of the cement. Under these circumstances the lime, though not chemically combined, is engaged and kept out of harm's way. The high temperature in the kiln has gradually condensed the mass, and most prominently the silica. The globular texture attained in moderate heat was simultaneously transformed into a limited semi-vitreous texture. The Portland cement owes its high reputation largely to such physical changes. Globular texture makes contact by points, while laminated texture achieves more intimate contact by surfaces. In our case it secures in strata of equal height about 50 per cent. more cementing substance than a mass of globular particles. This close packing intensifies cohesion of which the high tensile strength is the brochant. After cooling, the clinkers are ground to impalpable dense, drossy, steel-hard powder, having a specific gravity of 3.0 to 3.15. A few weeks' storage seasons the product and makes it ready for use.

#### Setting and Hardening Processes.

All the combinations produced during calcination contain more lime than can be disposed of, for the formation of hydrates, when the cement is mixed. Hence, under the influence of water, decomposition sets in, combinations are formed which are poorer in lime, and lime is disengaged which, in the presence of alkalies, soda and potash, crystallises to some extent. In the hardening cement there is not any combination of lime which is insoluble in water. The durability of hydraulic cements in water, and prominently in the sea, is not caused by their chemical composition, but by physical properties mentioned above, and in addition by part of the liberated lime absorbing eagerly carbonic acid from the atmosphere, and forming insoluble carbonate of lime which makes a protecting coat over the surface of the cement, and counteracts the decomposing tendencies of the water. Under the influences the texture of the cement is sufficiently condensed for debarring access into the interior of the wells to the carbonic acid itself which, when moist, would act on all the calcareous combinations with silica, alumina and iron. As accessory ingredients occur in Portland cement, sulphate of lime and other combinations of sulphur which, combining with seven chemical equivalents of water, and even more, cause considerable increase of volume.

This explains why a large percentage of sulphuric acid endangers the durability of hydraulic cements, while a small addition of it tends to increase their strength. If the contents of clay in Portland cement rise above 50 per cent. of the calcined lime, overlaid cement, complete vitrification is to be feared during the burning, the lack of cementing substance, lime, is felt, and the cement becomes an inert mass unfit for use. On the other hand, an overlimed cement tends toward quick-setting and blowing or expansion. These efforts, due to presence of free caustic lime, may be remedied by airing such cement, for a day or more, when the caustic lime will absorb carbonic acid from the air and become an indifferent body for the cement. There is for each material one most favourable position in which the tendencies to shrinking and to blowing neutralise each other so that a good cement is the result. The chemical reaction requires, for cements burned at white heat only, half as much water as those burned at moderate heat; this, no doubt, contributes to the superior strength of the Portland. Water, 20 to 25 per cent. of the weight of the cement, generally suffices for mixing pure cement. Mixtures with sand, according to its dry or moist state, require increased quantities.

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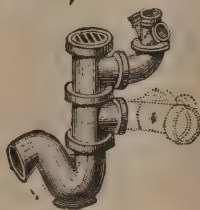
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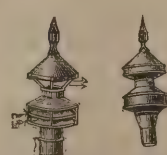
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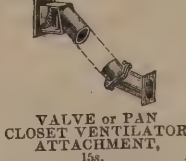
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By far the strongest mortar, with or without sand, results from mixtures in a state of incoherent dampness with no more plasticity than absolutely necessary for the work in hand. Too long continued stirring, or excess of water, prevent setting, a paste being formed which slowly hardens by shrinkage, caused by evaporation and pressure, analogous to fat lime. Normal material and treatment result in slow and cool setting, but comparatively low adhesive power.

The strength increases for a slow-setting cement gradually for about two years, while the comprehensive strength increases for many years. All Portland cements bear very large doses of sand. These gradually retard setting and reduce the tensile strength of pure cement, one year after mixing, for 1, 2, 3 and 4 parts of sand to 1 of cement, by 25, 50, 60 and 70 per cent., Michaelis's and Grant's tests. Excessive doses of sand make a hard, raw mixture difficult of manipulation, hence become unsuitable for architectural work. Portland cement is dangerous for use in fastening projecting blocks or ornaments to walls. The fat cement mortars shrink on exposure to air. In addition the silica, the texture of which was condensed by the extreme kiln heat, expands within the mass during the hardening process, and as a consequence drops of water are observed to be pressed out of the pores of the mortar. The cement, then, frequently separates from the surface which it had cemented before, especially if they consist of very dense stones, like granite and marble. Michaelis has followed up this mischievous tendency minutely.

#### *Colour of the Portland Cement.*

Silicate and aluminate of lime are white. This ground colour is covered by coloured combination, in which the vitrification is effected. Well Portland cements have a greenish brown colour, caused by dark brown ferruginous lime, and the intensively green manganese salts. Weaker burned cements appear greenish green, because this ground colour is but partly covered. Admixed sulphates occasionally cause yellow, reddish and green colour. The properties of Portland cement are often misleading. Light weight may be caused by laudable fine grinding or by objectionable weak burning. As a consequence of such dilemmas, J. Newman writes, in 1887, "specifications of Portland cement at present still differ as much as 300 per cent. in requirements as to fineness, 18 per cent. as to weight and 100 per cent. as to strength." The tact and intelligent observation required for obtaining reliable tests, have led to the adoption of standard rules by the German architects and engineers in 1877

These were substantially endorsed by the German Government in 1878, and afterwards by Australia, France, Sweden, Russia, Belgium and Switzerland, and made the basis of recommendations by the Society of Civil Engineers of the United States in 1885, and revised anew by the German Government in 1887. The latest phase of these tests may well be alluded to. They are for general use mechanically, relating to weight, fineness, setting, invariableness of volume and strength, leaving the important microscopic examination of thin sections showing the texture, of chemical analysis and of adhesive power reversed for test cases.

#### *Cement Tests.*

The weight of Portland cement varies from seventy to ninety-two pounds per cubic foot for brands of equally good quality. Since we buy by weight, it is immaterial what size the manufacturer must give to a barrel in order to bring it to the standard gross weight of 400 pounds, but each factory should be held to uniform weight of its output, the extreme differences not to exceed two per centum loss by leakage. Finest grinding of the whole mass coming from the kiln, and not merely fine sifting with a large percentage of granular residue on the sieve, is very important. All the granular residues, even on the finest silk sieves, have practically no setting power, and act little better than good sand. They represent the well burned clinker which did not yield to the action of the millstones as readily as the softer pieces. Finely ground cements have largely increased values for mixtures with sand. The new German regulations allow a residue of 10 per centum on a sieve of 13,000 meshes per square inch. Cements which set in less than half an hour are called quick-setting, and those which do not set before two hours are called slow-setting. These distinct provisions prevent misunderstandings as to what is meant by a slow-setting cement.

Excepting special cases, slow-setting cements, as most trustworthy, and best suited, must be specified for all works in architecture. According to the prevailing American needle test of Gilmore, cement begins to set when it bears a wire of 1-12 inch in diameter loaded with  $\frac{1}{4}$  pound; and it has set when it bears a needle with flat end, of 1-24 inch diameter, loaded with one pound, without making any impression on a flat cake of cement. Whether the volume of the cement has altered during or after setting, is ascertained by immersing in water a thin cake spread upon a glass plate.

Signs of crumbling or cracking at the edges indicate expansion. Fissures in the centre of the cake arise generally

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from premature exposure to draughts or sun heat, which cause shrinkage. The cementing power of Portland cement shall be ascertained by a mixture of sand and cement, as used in actual work, since reasoning from tests on the comparative value of different cements for mortar is unavailable. A most interesting instance is presented by tests made by the Association of Civil Engineers of Prussia, at Bonn. Pure cement gave, after 28 days, 426 lbs., and after six years, 556 lbs. tensile strength. One volume of same cement mixed with three parts of sand gave, after 28 days, 170 lbs., and after 6 years, 720 lbs. Average tensile strength, 160 lbs. more than the high figure for pure cement. For all mortar or cement tests, sands of equal size, quality and condition must be used for obtaining comparative figures. This is done by washing and drying quartz sand, removing the coarsest parts by a No. 20 sieve, 400 meshes to the square inch, and the finest particles by a No. 30 sieve, 900 meshes. Tensile strength has been generally used of late years as the convenient gauge for resistance to other strains. Though these relations are not uniform for different cements, it should be upheld as the expression of the cohesion of the mortar. The German regulations have restored that as the leading test for compressive strength. They require slow-setting Portland cement, mixed in the proportion of one part, by weight, to three parts of regulation sand, to have a minimum tensile strength of 230 lbs and compressive strength of 2,800 lbs. per square inch, after twenty-eight days' exposure—one day in the air and twenty-seven days under water. It is a grave error to require on works above the water level a too high tensile strength at an early day. Hydraulic quickness for exposure to the atmosphere is obtained at the expense of durability, while moderate strength and gradual increase with age are to be encouraged. Maclay continued to test cement rejected under the seven days' test. It overtook the accepted cement after a fortnight, and after eighteen months the advantage gained was kept up, 487 against 439 being the ultimate figures of strength. The strength of the cement increases from 35 to 40 per cent. in the interval between seven and twenty-eight days after mixing. The proportion between tensile and compressive strength, and between seven and twenty-eight days, having been ascertained for a brand—new cargoes received during the season—may be controlled by the tensile test, after seven days' exposure for adhesive strength. There are no new data, Mr. Grant found, for a mortar of 1½ of sand, after twenty-six days at 15 to 30 lbs. per square inch.

The properties of Portland cement, as enlarged upon,

characterise it as an excellent building material, especially useful in hydraulic architecture and important works where heavy strains must be withstood within a few days or weeks after they have been built. At high places where no difficulties from water are met and the load is but slowly and gradually imposed, reliable, slow-setting, natural cements are competent competitors to the Portland, since a breaking weight of 300 lbs., attained by the latter in a week, is by the better class of them approached within a year, so that a mortar mixed with them is of comparative value to Portland cement mortar, provided that equal care has been used in either case.

#### Mixtures of Cement.

Mr. Clarke, Boston, tested Portland cement mortar, mixed in the proportion of 1 : 3, and also Rosendale cement in proportion 1 : 1. One year after mixture he found the tensile strength of each to be 256 lbs. A richer natural cement mortar was equal to the weaker Portland cement mortar. He also mixed one-half part of Rosendale cement and one-half part of Portland cement with two parts of sand, and obtained, after one year, 273 lbs. tensile strength, while the same cements, separately mixed, gave for Rosendale, 1 : 2—180 lbs., and Portland, 1 : 2—323 lbs., the average being 251 lbs. Hence, the mixture showed a small gain, probably caused by increased density, in consequence of mixing cements of different texture. Consequently, mixtures of natural and Portland cements are unobjectionable and safe.

#### Mixtures of Cement, Lime, &c.

Superior strength, capacities for sand and hydraulic qualities, characterise Portland cement, but the adhesive power to brick and stone is but developed in lime mortar. It has long been an American practice to re-enforce ordinary lime mortar by additions of natural cements. Strength and hydraulic qualities are added to the solid adhesive qualities and durability of good lime mortar. Under competent management success has followed these mechanical mixtures resembling hydraulic limes, like the imported popular lime De Theil. Similar results have been lately obtained on the new frontier fortifications of the German Empire. Portland cement mortar containing doses of sand is mixed with lime paste. Large increases of adhesive power to bricks, and even small increases of strength resulted. The explanation appears to be because a small quantity of the strong material resists the tensile and crushing strains, hence the addition of large doses of sand.

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Fig. 1 shows how the ordinary prism or semi-prism, by receiving the rays on a plane reflecting surface, throws them forward at one angle only, in parallel lines close to the ceiling.

Fig. 2 represents the Patent Dioptrical Lens, and shows by comparison how the rays of light, striking on the curved inner surface, are reflected forward through the face of the lens in every direction, filling the whole angle of 90°, thus illuminating the apartment from floor to ceiling and from wall to wall.

From the above diagram it will be seen wherein consists the advantages claimed for Wilson's Patent Lenses. The objection to the semi-prism is that it reflects the light, as shown in Fig. 1, at such an angle as to be of little use, and more especially if the line of the ceiling in below the line of the pavement; then the value of the semi-prism as a light projector is entirely lost.

It will be seen also, on reference to the above diagrams, in Fig. 1 that the first row of semi-prisms obstructs the rays of light from each succeeding row, whereas in Fig. 2 the bulk of the rays of light are projected at such angles as to pass unobstructed into the room.

The correctness of these illustrations can be practically demonstrated to any architect desirous of testing them.

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But to be of use as a mortar, this diluted mixture lacks power for cementing bricks together, and this is economically and well increased by lime paste. Provided that the total amount of the mortar substances is large enough to fill the voids of the sand, the added lime serves to fill the still considerable interstices between the particles of cement. This gives higher density—the greatest strength possible with the large dose of sand, and is important for architectural work.

The special requirements of the best mortars for architectural work have not been brought out yet with efficient force. In the mixtures of lime paste with the natural and artificial cements the true solution will be found most likely, because they permit to approach in grade and intensity the slow and steady action of the hydraulic limes, which make excellent material for works exposed to the atmosphere, though they are of limited importance for hydraulic engineering.

Dr. Michaelis writes:—"It has been overlooked of late that water is the element in which the hydraulic mortars develop their full efficiency." All hydraulic cements require for their preservation protection against desiccation, hence moisture. Such cements as consist substantially of hydrated silicates of lime alone act well under water, but when exposed to the atmosphere they are acted upon by carbonic acid, when carbonate of lime, an insoluble body, is formed, an action accompanied by considerable shrinkage, causing minute fissures, which must end, sooner or later, with destruction with atmospheric influence.

#### Concrete.

Concrete is case masonry made of mortar without artificial bond, into which pebbles and broken stone, or similar material, are embedded, in order to reduce the consumption of mortar. The lime or cement acts as the principal material of construction; the coarse, inert accessories are called aggregates on ballast. The strength of concrete depends upon the cohesion of the mortar, adhesive to the aggregate, irregular bonding or interlocking of the coarser fragments, and upon the strength and proportion of each ingredient. Rough, coarse-grained, clean sand is best. Maclay found 11 per centum decrease of strength in Portland cement mortar mixed 1 to 1 of fine sand as compared with coarse sand. With larger doses of sand the loss is greater. To insure compact packing, the ballast consists best of mixture of crushed stone, 1 to 3 inches diameter, and pebbles, which are at least equal to the strength of the mortar. Sun-dried or rain-soaked material is to be strictly avoided. The cementing processes depend upon the use of the concrete.

The finest condition for a solid durable concrete above water is, that it is as dense and homogeneous as possible whilst setting.

Judicious handling of medium quality material may bring out a good concrete, and prevent a dead waste of cement, frequently resorted to to counteract the result of defective manipulation. Concrete has a specific gravity of 1.5 to 2.5, according to its composition of crushed bricks or heaviest stones. A cubic yard weighs from 2,500 to 3,900 pounds. All the voids between the stones need not be filled with mortar. Only enough mortar is required for forming a coherent reticulated film between the coarse ingredients which, by interlacement consequent upon tempering, approach each other in numerous points and surfaces. This secures the necessary frictional stability, without sacrificing the advantage of permeability, or slight porosity, which favours natural ventilation by the diffusion of air through heavy walls. The French architects use air concrete largely for filling in walls of unusual thickness on monuments or ornamented projections of buildings.

For the architect's practice the natural hydraulic lime concretes for use in foundations is an object of importance. It should be water-tight; hence the voids in the larger-sized ingredients must be filled solid by the mass of the mortar, and the latter is, again, to be so constituted that the voids between the grains of sand shall be closely filled by the cement paste.

The addition of water is to be limited to the actual requirements, which fluctuate for natural cements between 50 and 55 per cent., and for Portland cement between 40 and 45 per cent. of the weight of the cement used. Plasticity is only to be attained by diligently tempering an apparently dry mass until water appears on the surface. The proportions of this material are to be ascertained by measuring the respective voids. If stones passing through a 2-inch ring, mixed with pebbles, are used, the space between the stones will approximate 28 to 35 per cent., to which an efficient of safety of 15 per cent. ought to be added for obtaining the amount of sand needed. Since concrete work once done cannot be well controlled, it is for the superintendent to watch that this legitimate construction is not overloaded by heavy discounts, chargeable to indifference, carelessness and dishonesty. The voids between the grains of sand will probably amount to 33 per cent.; that is to say, 67 per cent. of the cubic contents to be occupied by the mortar is absorbed by the sand, and 33 per cent. is to be filled in with cement, so that a mortar of one part of cement to two of sand, and no more, is required. A strong, water-tight concrete will

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proximate, by volumes, cement, sand, ballast, as 1 : 2 : 5, and fine Portland cement.

This mixture may reach, after two weeks, a compressive strength of 175 tons per square foot. The 8 volumes of material fill finally a space of about 5 and 2 volumes. A weaker compound, not strictly water-tight, would be 1 : 3 : 6, one-half. General Casey tested a Portland cement mixture of 1 : 2 : 7, three of pebbles, and four of broken stone. It was 138 days old, and showed the first crack at 125 tons, and crushed at 155 tons per square foot. This mixture was successfully used for enlarging the foundations of the Washington Monument, which implied transverse strains at the outer ends of the concrete slabs. The maximum pressure upon the ground under this structure is 5 and 4 tons; but since the maximum pressure at the outer edge of the foundation is nearly 10 tons, the concrete immediately underneath may be assigned to be equally loaded.

As for concretes made with natural cements, a mixture 1 : 2 : 4 is used in a portion of the Washington aqueduct extension, nearly four miles in length, where it is subject to a hydraulic proportion pressure of 4 : 4 tons, a water column 140 feet high. For ordinary purposes a mixture of 1 : 2 : 4 : 4, pebbles and stone, with first-class Rosendale cement, used by competent hands, ought to stand, ten days after deposition, a load of 16 to 20 tons per square foot. For practice, the following conclusions are arrived at. A correctly proportioned concrete has fully as much strength as the cement mortar used in mixing it. By diminishing the ballast below the calculated quantity, the cost of the concrete is increased without benefit to the strength. Strength increases for seven months and over by 30 to 40 per cent. Concretes, with weakest mortar, start low, but catch up considerably in time.

#### PATENTS.

*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]*

#### APPLICATIONS FOR PATENTS.

16632. David Jones, for "Closing the proscenium openings of theatres, music-halls, or other buildings so requiring by

means of a wrought-iron framed rigid curtain." November 16, 1888.

16753. Alexander Gray, for "Grinding Portland and Roman cements, and other cements of a similar nature." November 17, 1888.

16774. Burton R. Phillipson, for "The distribution of sewage," which he has named "The terrace system of sewage distribution." November 19, 1888.

16822. John B. Walker, for "Improvements in ovens or gas cooking-ranges." November 20, 1888.

16825. John Ruscoe, for "Improvements in the application of enamel coating on the rims and in the grooves of pulleys." November 20, 1888.

16846. Charles Allen, William Allen, Walter Allen, Jesse Allen, and Frederick Allen, for "Improvements in and apparatus for glazing horticultural and other glazed structures." November 20, 1888.

16860. Wilhelm Doehring, for "Improvements in and relating to plastering, and in the preparation of baths and the like therefor." (Complete specification.) November 20, 1888.

16867. Alfred Julius Boulton, for "Improvements in baking ovens." (Charles Frederick Hubbard, Canada.) November 20, 1888.

16881. William Sparrow, for "An improved method for utilising gas and electricity for illuminating names of railway stations, shop signs, fascias, and trade signs generally." November 20, 1888.

16884. Alexander del Guerre and Demetrius Steffans, for "Improved devices for securing doors." November 20, 1888.

16901. James Smith Naylor, for "Improvements in and appertaining to automatically closing doors, applicable for preventing the spreading of fire in mills, warehouses, or like buildings." (Marshall Tillotson, United States.) November 21, 1888.

16912. Henry Brecknell, for "A straightway valve or cock, as may be termed." November 21, 1888.

16946. James Yate Johnson, for "Improvements in fittings and switches for incandescent electric lamps." (Theodore Mace, United States.) November 21, 1888.

16969. Ephraim Taylor, for "Improvements in holders and shelves to be used in combination with firegrates and ovens for heating and cooking purposes." November 22, 1888.

16975. Thomas Wolstenholme, for "A new or improved apparatus for hanging wall-papers and the like." November 22, 1888.

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16993. William Chattamey, for "Improvements in lock-nuts." November 22, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

12535. John Balbirnie, for "Improvements in apparatus for heating, cooling and ventilating buildings." August 31, 1888.

13872. Thomas Morton and Henry Robert Townshend, for "An automatic fastener for attaching lines and cords to sashes, windows, shutters and the like." September 26, 1888.

13915. Frederick Charles Broadbridge, for "Improvements in window fastenings." September 27, 1888.

14215. Thomas Barnet Grant, for "Improvements in means for locking nuts and bolts and set screws." October 3, 1888.

14423. Henry Metcalf, for "An improved ventilating cowl." October 8, 1888.

14768. Alfred Coxon, for "Improvements in drying slurry in the manufacture of cement." October 13, 1888.

14842. Edgar Willmott Taylor, for "Improvements in wardrobe, cupboard and other similar door fastenings." October 16, 1888.

15162. Frederick John Hawkes, for "A new form of blind or picture cord, suitable also for other useful ornamental or decorative purposes." October 22, 1888.

15277. John Bell Millar, for "Discharge and overflow for baths, sinks, lavatories and similar vessels." October 24, 1888.

15313. William Andrew Young, for "Improvements in the construction of crank shafts." October 24, 1888.

15318. Anne Mary Newall, for "An improved double clip window, floor, and wall-cleaner." October 24, 1888.

15389. Alfred Winrow, for "Improvements in machinery for pressing or stamping tiles and bricks." October 25, 1888.

15542. Edwin George Wade Moon, for "Improvements in flushing cisterns for water-closets and other purposes." (Joseph Cawte Butler, New Zealand.) October 29, 1888.

15899. William Henry Kent, for "An improved device for moving curtains attached to rings hanging from poles or rods." November 3, 1888.

To INVENTORS.—Patents for Inventions, Trade-marks, and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & CASSELL, Patent Agents, 43 Southampton Buildings, Chancery Lane.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office in the prescribed form of such opposition.

15923. Thomas Burns and James Stone Dumhell, trading as Thomas Turner & Co., for "Improvements in and relating to locks, latches, and keyhole escutcheons." November 19, 1887.

438. Albert Roberts, for "Improved sludge-pans, applicable to street gulleys and other like gulleys." January 11, 1888.

679. Jonathan Haley, for "Improvements in the manufacture of glass tiles, and other glass articles." January 16, 1888.

890. Edward Peart Brett, for "Improvements in ventilating apparatus for improving chimney draughts and promoting draughts in ventilating shafts." January 20, 1888.

1375. James Archer and Henry Faulder, for "Improvements in hoists or lifts." January 30, 1888.

1997. Emile Dupont, for "Improvements relating to the construction of walls and other partitions, roofs, and similar structures." February 9, 1888.

10840. Lewis Anidjah, for "An improved household fire-escape." July 26, 1888.

#### PATENTS SEALED, NOVEMBER 23, 1888.

12796. Frank Moore and William John Fieldhouse, for "Improved close and open fire cooking range." September 21, 1887.

14656. Thomas Glennie, for "A new system of sewage disposal." October 28, 1887.

14776. Samuel Timings and Samuel Hill, for "Certain improvements in spring catches or spring fasteners for doors, windows, or the like." October 31, 1887.

14951. Thomas Minton, Herbert Minton Senhouse, Herbert Minton Robinson, James Clegg, and Joseph Sea, for "A new method of printing upon pottery and tiles." November 2, 1887.

15292. Robert Middleton, for "Improved safety appliances for lifts, hoists, and the like." November 9, 1887.

15372. Joseph Morris, for "An improved ventilator and chimney cowl." November 10, 1887.

15483. John Boulter, for "An automatic indicator for water-closets and other apartments." November 12, 1887.

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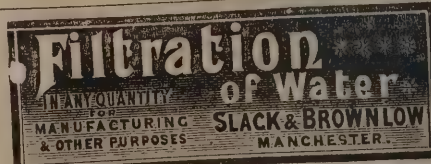
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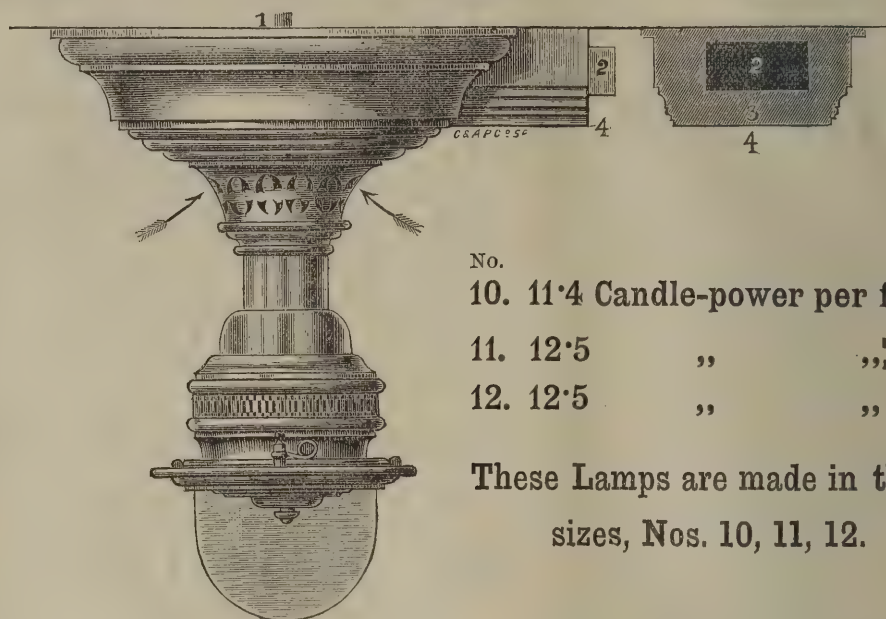
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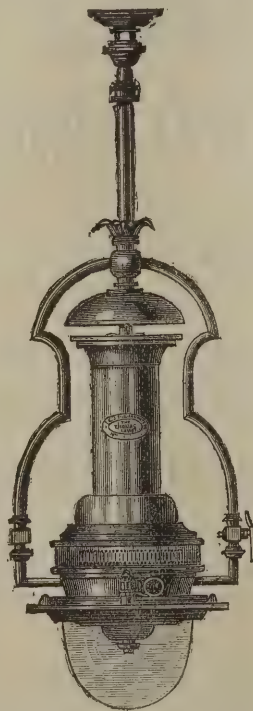
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# The Architect.

## THE WEEK.

ON Monday Mr. HOOPER, the holder of the Godwin Bursary, read a paper at the meeting of the Institute of Architects, when Mr. THOMAS WORTHINGTON occupied the chair. The paper, called "Building Control in Paris," entered minutely into the details of "administration," to use a significant term of Professor KERR in regard of architecture. It was hardly possible to avoid instituting a comparison between London improvements and "how they manage these things abroad," and Mr. WOODWARD, as it were, deprecated adverting to the Metropolitan Board in Mr. BLASHILL's presence. Observing he was sure that Mr. BLASHILL had at heart the interest of the architectural well-being of the metropolis as much as any among them, he went on to ease his mind of grievances which have exercised the minds of others as well as himself. Opportunities of making the improvements to the full effect had been lost. The utility of new streets was sacrificed for the sake of a few feet extra width. But, worst of all, within the last few months the Metropolitan Board had given leave for a building to be erected which should project 38 feet beyond the building-line in the Marylebone Road, contrary to the stipulations of the Act of George II., for the construction of the new street from Islington to Paddington, contrary to the wish of the vestry, and to the destruction of a "magnificent avenue." This should scarcely surprise members of the Institute, who must have some experience of the autocratic methods often employed by the Board. Mr. BLASHILL did not claim to speak except in his capacity of a member of the Institute of Architects, but in a genial fashion he deplored that persons should attempt criticism without knowledge of facts. Mr. WOODWARD's reply, however, shattered Mr. BLASHILL's defence, and he wound up by remarking that that gentleman had been silent on the gravest point—that of allowing the projection of the building over the line, and also that the question whether the Act of George II., which Mr. BLASHILL alleged was repealed in 1855, had been repealed, was still *sub judice*.

THE success of the British Association for the Advancement of Science could not fail to suggest the founding of a similar Society for its furtherance. For at least half a century proposals of the kind have been brought forward. Not until this week could such a Society appear as a reality before the public. Although nothing can be easier than to talk about art, it is no simple task which is before the founders of the National Art Congress. Their experience this week in Liverpool must convince them that the gathering of crowds will not be of much service to art unless something more follows. The chief attraction was taken to be the presence of Mr. ALMA-TADEMA, who was known as the author of a picture which had scandalised many strait-laced people. So many people besieged the room assigned to the section of Painting, it was found necessary to carry off the artist to a theatre where the crowds could be satisfied with gazing on him. An excitement of that sort is contagious, and it is to be hoped Mr. ALMA-TADEMA will not have to be its victim during the ensuing years. It indicates the spirit which induces people to go to congresses. In the British Association the sightseers have become familiarised with the *savants*, and it is necessary to get up supplementary entertainments in order to have the appearance of prosperity which comes from the sale of tickets. The interest which Sir FREDERIC LEIGHTON has taken in the Congress proves that there is a necessity for doing something to make people take more interest in art, and his eloquent address will, we hope, atone for the negligence of the Academy during the greater part of its existence to do anything for art except what was inspired by selfishness.

FOR some weeks it was known that Mr. BURGESS was destined to be the new Academician, and there was only one opinion about his eligibility. Twenty years ago, when

he and Mr. LONG entered on the field which was once JOHN PHILLIP'S, it was prophesied that Mr. BURGESS was to enter first within the Academy. If Mr. LONG had kept to Spanish scenes that might have happened, but happily he was attracted by subjects which gave more scope to his imagination. It is no use now to ask why Mr. BURGESS should have remained so long an Associate. His pictures always showed the hand of a skilled artist. In the Manchester Jubilee Exhibition it was found that he could hold his own against the painter from whom he drew inspiration at one time, and after his success against JOHN PHILLIP his claim to the full honours of the Academy could not be denied.

It is not unlikely that something more will be heard about the deviations from the contracts of the School Board of London. The following is the first resolution which Mr. GOVEN has inscribed on his re-election:—"That it be referred to the special committee on the work of the Works Department to bring up a report as to whether proceedings should be taken against any, and what, contractors who have charged, and been paid, for work not executed, or who have otherwise broken their contracts with the Board." The resolution is an amendment to one standing back for several weeks which Mr. HELBY proposed:—"That, as the report of the special committee upon the work of the Works Department establishes the fact that losses have been sustained by the Board in connection with the building of schools, and as the special committee have been unable to definitely ascertain who are the parties who have profited by these transactions, in the opinion of the Board, a representation of these facts should be made to the Lord President and the Vice-President of the Council, praying them to take such steps to institute a full and searching inquiry into these transactions as they may deem to be necessary." There is much to be said in favour of the original proposition. The special committee have been over lenient, and in the interests of the public an independent inquisition is demanded, and a plainly spoken report.

It was to be expected that the coroner's jury who had to consider the accident at Great Titchfield Street should seize upon anything which seemed to be a definite cause for the subsidence of the building. On Wednesday Mr. APPLETON, a builder, ascribed the accident to the weakness of the 14-inch wall. He said it should have been built in cement instead of mortar. According to this witness the columns in Ridinghouse Street had the heaviest weight to carry and fell first, causing the weight to go on the other columns, and that the wall fell with it. On the other hand, Mr. JENNINGS, the district surveyor, described the work as very good, including the mortar, and said he was not prepared to say what was the cause of the accident. Other witnesses ascribed it to the columns being of inadequate strength. But the jury selected the wall as being the offender, and added the following rider to their verdict of accidental death:—"The said jurors, after hearing the evidence of the experts, are of opinion that the 14-inch wall, built with mortar, was not sufficiently strong to carry the weight of the superstructure, which on a continuous iron bressummer was concentrated upon the column in the centre of the building in Ridinghouse Street, and the jurors consider that this was the cause of the sudden collapse of the building. The jurors consider that such iron columns should have been placed on brick piers built with cement; and further, that the practice of loading the floors of new buildings with materials used for their construction and otherwise should be avoided, as they are likely to cause strains upon the building generally. The jurors are further of opinion that the architect, Mr. MILLER, should, in the exercise of his discretion, have taken greater care in designing such building, so as to insure the stability without risk of any kind; further, that they consider that enlarged and discretionary powers should be conferred on district surveyors, so as to permit of more efficient supervision than they at present possess." This opinion is comprehensive enough. The question now remains about who is to pay for all the damages, and the accident will, we trust, be investigated in a more scientific way.



## THE JOURNAL OF THE GONCOURTS.

ONE of the most curious of modern French works is the "Journal des Goncourt." Although it is not adapted for general circulation, even in France, yet it is likely to be among the books of our time which will be read hereafter. The brothers JULES and EDMOND DE GONCOURT realised SHAKESPEARE'S idea of "an union in partition, two seeming bodies but one heart." Their journal is, they say, the confession of two lives that were inseparable, of two spirits that received identical impressions from things. There is something unique in revelations which have an origin of that kind, for the union of the brothers was different from ordinary literary partnerships. The nearest approach to it in England is represented by the works (mostly unpublished) of SOBIESKI and CHARLES EDWARD STUART. The brothers GONCOURT were not only of one mind in the ordinary sense of the phrase, but both on principle adopted the same theory of literature and art, and devoted themselves to its propaganda with equal energy.

That theory was realism. At present M. ZOLA is generally taken as its representative in literature. But he has testified that the two GONCOURTS and FLAUBERT were its inventors. People sometimes believe that realism is easily produced by men who are ignorant and too slothful to go through the preparations which are necessary with work of a different class. An accusation of that kind will not apply to the GONCOURTS. The historian MICHELET, when writing of their books on the eighteenth century, has described them as learned as well as ingenious. The labours which the two men undertook for the elaboration of a novel seem incredible. Nothing was left to the imagination, and every statement was tested. Believing that in France, if not elsewhere, all action turns on nerves, they have studied that branch of physiology as if they were to write a treatise for experts. A man is always disposed to be vain of knowledge which he has acquired without the aid of teachers, and it must be owned that when the GONCOURTS have to write about any form of hysteria, they become indifferent to the danger of having overmuch of one seasoning. Hysterical men and women may find a strange delight in following descriptions which are like demonstrations in a classroom of anatomy, but out of France the books containing them may be ignored without much loss.

For two men who are skilful in observation and analysis there could not be found a better field than Paris. The GONCOURTS have cultivated it, and it has yielded the journal, as well as other things. The volumes record an experience of about twenty years, that is to say, during almost the whole period of the Second Empire. Their first book appeared on the day which the *coup d'état* made memorable, and the death of JULES GONCOURT, which put an end to the common diary, occurred about a month before the war with Germany began. As a record of many things which will not be found in ordinary histories the journal may one day be prized. But among the uses of the work at the present time is the light it throws upon the principles of many French writers and artists.

The GONCOURTS had their own set of associates, and appear to have been oblivious of many of their contemporaries in literature and art. They could not be reckoned among Bohemians, and seem to have avoided the men who were fighting the battle of realism as painters. There is no mention in the diaries of a meeting with MANET or COURBET, or RIBOT or BONVIN. The diarists might be coarse in language, but they take care to make it felt that they never ceased to be fine gentlemen.

Among the artists the man who appears to have gained most of their esteem was GAVARNI. When they knew him he was subject to what might be called a craze for mathematics, but however he might ramble in his visions the diarists always write about him as if he were one of the greatest men in France. THÉOPHILE GAUTIER held a corresponding position in letters for them.

It is remarkable to find that in a discussion about antique art, GAUTIER, who was a worshipper of the beautiful, if there ever was one, declared that PHIDIAS was *un décadent*. In what sense must be left to the imagination. But still more remarkable is an anecdote of RUDE, the sculptor, which illustrates the same theory. He placed a cast of the great head of the horse from the Parthenon, in the British

Museum, beside the head of a Paris cab horse, and pointed out how the latter was more beautiful than the Greek work. From the contrast he came to the conclusion that the Greeks represented simply what they saw, and were not seekers after the ideal. We can understand the gratification of the GONCOURTS in having the authority of the sculptor of the finest of the groups on the Arc de l'Etoile for their theory. Another sculptor with a belief in realism was CARPEAUX, who afterwards produced the group of the *Dancers*, which stands in front of the Paris Opera House. The journalists record how, in a railway carriage, he explained his theory of aesthetics to them, which consisted in following nature as it appeared. He maintained, also, that as fine models were to be found among the Cent Gardes as those employed by the old Greeks. As for modern Greeks, a Prix de Rome stated that when they modelled it was solely by the aid of engravings, and in Athens neither models nor modelling clay can be found. The GONCOURTS maintain that in Greek art there was neither dream, nor fantasy, nor mystery, nor any of the ideality with which it is endowed by WINCKELMANN and the professors of the French Institut. They point to the torso of the Vatican, which they place at an elevation infinitely above the *Venus de Milo*, as being suggestive of a man who was not fed on ambrosia but on human nature's daily food, and could digest it satisfactorily. The application of the sculptor BARRE for permission to take casts of the two hands of the Princess MATHILDE, in order to impart more life to a statuette he was making, was also an illustration of the value of realism.

The GONCOURTS are hard upon painters like PAUL BAUDRY, who have faith in the traditions of art. For that reason they seem to have avoided exhibitions of pictures unless in one instance. Even with men of their class, the Salon of 1857, coming after the International Exhibition, could hardly fail to excite more than the usual amount of criticism. The question asked by every one was how far the standard of 1855 could be kept up, and after seeing the galleries the majority of the critics were satisfied. France was supposed to have reached a greater height than was possible in the reign of HENRY IV., and there was a disposition to applaud the artists who had upheld the reputation of the country in the international contest. The new sect of Realists fared badly at the time, for the Salon of 1857 was under the control of their enemies, the grandees of the Institut. A writer, who was one of the hangers-on of the court, and who did everything with a view to promotion—EDMOND ABOUT—expressed the official sentiment towards realism, which for some reason was treated as treason in disguise. Judging by ABOUT'S criticisms on the Salon of 1857, realism is a moral infirmity, an epidemic, an epizootic disease, a coalition between fellows who cannot design or write against drawing and orthography, and so on. Now it so happens that the only Salon Exhibition which is noticed in the GONCOURTS' volumes is that of 1857, and their words give us another view of the Exhibition. They describe the artists as an army of seekers after ingenious ideas, and the pictures as literature of the pencil. The ideals were either anacreontic or mythologic, but to be anecdotic was the chief ambition, and a man reached the sublime if he hit on such a subject as *Molière Reading the "Misanthrope" to Ninon de Lenclos*. The road to success was by the drama, the apologue, and whatever was not painting. The GONCOURTS say they would not be surprised to find a printed poster reproduced on canvas, as if it were something *spirituel*. The President of the Academy has denounced a similar spirit as inspiring English pictures. We have often said our painters are only illustrators of subjects taken from books, and yet they are surprised that critics will not take them to be artists with whom execution is everything.

There was one artist with whose work the GONCOURTS might be supposed to have sympathy. Archdeacon FARRAR on Sunday described MILLET, the French painter, as teaching France "the lessons of the true intrinsic grandeur of manhood and of the infinite sanctity of toil." Divines have their own rules of interpretation, which are often incomprehensible to laymen. We must not therefore wonder if the Archdeacon gives a meaning to the pictures which the painter never intended they should



bear, and which is no less amazing to any one who has watched the life of French peasants. The GONCOURTS' explanation of MILLET's work is very different. They express astonishment at the courage of the man who dared to represent what he saw of women from whom feminine beauty had disappeared, who were flattened by labour and misery, and might be called workers without sex. The brothers do not appear to have met MILLET, but his friends told them many things about him. His first drawings were copies of the engravings in his grandmother's prayer-book. His father showed them to a drawing-master in Cherbourg, who said it would be a murder if so promising a boy became a field labourer. The Municipality of Cherbourg granted young MILLET a pension, which enabled him to enter DELAROCHE's atelier. But residence in Paris did not cause him to forget his country ways, and at Barbazon he could work in the fields. His wife was a peasant, and was unable to read or write. When MILLET was absent he corresponded with her by means of marks or signs on paper, which served instead of words.

The French are not great travellers; indeed, we find it stated that GUYS, the draughtsman, said no man ever saw in London a Frenchman who had crossed to see the place, and who spent his money tranquilly like the English in Paris. Frenchmen of that species are no less rare in other cities. It was, therefore, we suppose an important event when MM. GONCOURT packed up their trunks and departed for Germany in company with M. SAINT VICTOR. It must have been a sacrifice on the part of their friend, for he hated all people who did not belong to the Latin race. Their object was to see pictures by French painters of the eighteenth century in order to describe them. Heidelberg reminded them of VICTOR HUGO, whose poems they believed would defy time. In the Dresden Gallery they noted two pictures of their countryman WATTEAU, and nothing else. The frescoes of KAULBACH in Munich appeared to their eyes to be as stupid as a metaphor of the Revolution, but compensation was found in the *Barberini Faun* in the Glyptothek, which is described as being the most admirable translation by the sculptor's art of a humanity that was contemporary with the gods. At Vienna, in the Lichtenstein Gallery, they single out the four works of CHARDIN. They enjoyed the Austrian capital, and confess that Paris appeared grey and dull after it.

Afterwards the three travellers ventured on an expedition to Holland. On seeing the *Night Watch* of REMBRANDT, they say the works of SHAKESPEARE were recalled, for the girl in front, who is so brilliantly clad in what seem to be emeralds and amethysts, and whose cap is of gold, seems to be a type of some of the poet's characters, such as PERDITA. But the work which appeared to be the most marvellous example of the painter's art, the most beautiful picture in the world, is the *Four Syndics* of REMBRANDT.

PAUL DE SAINT VICTOR, whose name is so often mentioned in the volumes, was one of those able writers who are attached to the French press. As a dramatic critic he was influential. But he was always planning books which would give scope for the display of his scholarship and his thoughts. One of them was to be upon the metopes of the Parthenon; but he was afraid that the French language was not rich enough in *vocables religieux* to enable him to do justice to figures in which divinity circulated like blood in mortals. It was characteristic of him to have the walls of his room hung with facsimiles of drawings by the great Italians, and he treated everyday affairs like a man who had descended from a height. But the GONCOURTS considered there was overmuch of the scholar and too little of the observer in his views of life.

In March 1867 the GONCOURTS departed for Rome, mainly for the purpose of imparting local colour to their novel "Madame Gervaisais." There was supposed to be a lack of civilisation in the Rome of that time, but as the travellers were keenly observant they could not help to remark that there was compensation for the absence of discussions over a budget, parliamentary debates, conscriptions, heavy taxation, and other signs of progress and liberty. They were inimical to everything Papal, but they found that the Roman people had the gaiety of their skies, food was cheap, wine was at a nominal price; there was no humiliation in the poverty or bitterness in the misery, and everybody was charitable.

Their visits to the Vatican Museum confirmed their belief in the overwhelming superiority of the Greek sculpture. The value of Greek painting they do not discuss, for, apart from absence of means of information, they seem to have a misgiving about its qualities. Painting, they say, is not drawing; colour should be its chief characteristic; and apparently colour is only to be found in countries where there are fogs—where certain prismatic effects ascend from the water to the air, as in Venice and Holland. Greece, with its clear ether, may not have been more inspiring for colour than Umbria.

The famous fragment of the group of APOLLONIUS, the torso of the Belvedere, is described as being the only example of art in the world which imparts a complete and absolute sensation of a *chef-d'œuvre*. The GONCOURTS say it confirmed them in the idea which was instinctive with them, viz., that the supreme beauty is the exact representation of nature by a genius, and that the ideal, which so many have sought to introduce in art, is always of inferior value to truth. On the other hand, the *Moses* of MICHEL ANGELO, with its gross muscles, its exaggeration of force, its rivers of veins, is declared, when compared with the torso, to be the work of a *décadent* who was no less corrupted than BOUCHER, although one sought to express force and the other grace.

Only one painting in the Vatican finds a notice in the journals. It is RAPHAEL'S *Transfiguration*, and it is described as leaving the disagreeable impression of paper badly painted. The colouring, composition, and sentiment are said to be defective. In fact, the picture is found to be grossly material as a representation of a Scriptural event, prosy and vulgar as a work of art. But RAPHAEL is not one of the divinities of the GONCOURTS. In reporting a meeting where TAINÉ was cross-examined for his statement about the four caryatids of humanity being SHAKESPEARE, DANTE, MICHEL ANGELO, and BEETHOVEN, it is said that somebody asked where was RAPHAEL? The journalists remark that the querist was incompetent to distinguish a work by RAPHAEL from one by REMBRANDT! A man who thought about the Roman painter must thereby be taken as a dunce. In another part we find a shrewd remark about the position of the eyes in an Italian picture being an indication of the age when it was produced. From CIMABUE to the Renaissance, the eyes are placed further apart than in Byzantine works, and, finally, ANDREA DEL SARTO and CORREGGIO follow the precedents of the Greeks, and nature also in fixing the positions of eyes.

VIOLLET-LE-DUC is described in the journal as "le fin et discret observateur," but his observations will not allow of reproduction. His uncle, DELÉCLUZE, who was one of the writers on the *Débats*, related that he went to see the newly-decorated Sainte-Chapelle with his nephew, who exclaimed that a parrot was necessary for the cage, a specimen of ribaldry which was not creditable to an ecclesiastical architect. DELÉCLUZE on that occasion abused the use of polychromy in connection with architecture and sculpture. He maintained that PAUSANIAS does not mention the employment of paint in that way, and the examples in Pompeii belong to a period of decline. Any one who has seen VIOLLET-LE-DUC's freaks in the chapels of Notre Dame and in other buildings will say it is a pity his uncle was not able to exercise a little influence over him.

The GONCOURTS claim to be the founders or the revivers of the taste for Japanese and Chinese nick-nacks. They relate how a description of theirs of a chimney-piece adorned with *bibelots japonais* was supposed to have qualified them for admission to the Charenton madhouse. Art is not, they say, of one time or place, and Japanese art has its beauties as well as the Greek. The Princess MATHILDE was one of the early converts to the new taste, and it is recorded that when the representatives of academicism were dining with her, the Princess startled them by declaring aloud in a violent manner that she preferred a Japanese to an Etruscan vase. The brothers do not, however, bore their readers about their hobby, but any remarks they make upon it are well founded, as when they speak of the peculiar faculty of the Japanese to create monsters, hydras, and chimeras, whilst none of the European artists has succeeded in designing anything more terrible than the one in INGRES' picture.

SAINT-BEUVE, the critic, paid the GONCOURTS the



honour of seeking their acquaintance. On his side he tried to be friendly, but there was no return. Among the features of the journals which will be considered most displeasing are the persistent efforts to belittle the man who in his line was without an equal in France. Even his dolours as an invalid do not move the writers to treat him gently. No one would make out SAINTE-BEUVE to be a hero, but where would Frenchmen be if a good deal of tolerance about their past was not granted? In the course of his intellectual evolutions he had changed sides like a great many of his contemporaries, but why should a man who had to write for a living, and who was only an amateur politician, be punished because he varied in his beliefs, whilst with other men all transformations were excused? JULES JANIN, for example boasted, that the secret of his endurance as a writer was to be found in changing opinions fortnightly. No one could say that at any time SAINTE-BEUVE's writings did not express his thoughts; but if his criticisms happened to be unsatisfactory to some people they were supposed to be venal and inspired by malice. Even the Princess MATHILDE could at that time forget herself, and endeavour to make out the invalid's ingratitude as unpardonable, by describing all the presents which came from Her Highness to him. And the crime consisted in sending articles on literary subjects to a newspaper that was not subsidised by the Government. The GONCOURTS despised SAINTE-BEUVE because his scholarship did not comprise a knowledge of the details of art. He once told them that all he knew about pictures was derived from what VICTOR HUGO said to him in the galleries of the Louvre, and he had forgotten that little. He wished to write an article on his friend GAVARNI, and he asked the brothers to visit him in order to obtain their help. They were horrified when they discovered that he was not acquainted with the technicalities of art, and had not the details of the biographies of obscurities like ABRAHAM BOSSE and FREUDENBERG in his memory. The scholar took notes of what the brothers said, and they considered he was acting the rôle of a robber, and suggest that it was customary with SAINTE-BEUVE to steal his visitor's ideas, notions, and science in order to give value to his articles. In the records of literary quarrels there are strange scenes, but nothing so childish as the vanity of the GONCOURTS in speaking of SAINTE-BEUVE. The passages will make readers believe the brothers were easily led astray by prejudice, and are not to be trusted when they blame or flatter their contemporaries. Their recitals also seem to explain why the GONCOURTS had only one companion among the writers of their own age; the remainder were probably afraid of them.

### THE POSITION OF ART IN ENGLAND.\*

By SIR FREDERICK LEIGHTON, P.R.A.

LADIES AND GENTLEMEN,—I cannot but feel that to some of my hearers, and to not a few of those who do not hear me, but whom the words spoken in this place may chance to reach through the press, some brief explanation is due, at the outset, as to my occupancy of this chair. To them it is known that weighty reasons have for many years compelled me to decline all requests—and those requests have been frequent, urgent, and most gratifying to me in form and spirit—that I should publicly address audiences beyond the walls of Burlington House on the subject which is to occupy this congress—the subject of art. It is not without some compunction that I have followed this course, but the exigencies on the one hand of the duties of my office, and, on the other, a firm purpose, which you will not, I hope, rebuke, to remain always and before all things a working artist, have left to my too limited strength and powers no alternative but that which I have adopted. Nevertheless, I have felt justified in obeying the summons of the founders of this congress, and for this reason, that while the far-reaching character of the effort here initiated and my earnest desire to contribute, in however small a measure, to whatever of good may flow from it, have seemed to make it incumbent on me to accept the duty of saying a few words on this occasion, its comprehensive and national character lift it into a category wholly apart from and outside the sphere of purely local interests, such as those which I had hitherto been invited to support. I trust I shall be pardoned this short obtrusion of private considerations, and that you will see in it not a movement of egotism, but the discharge of a simple debt of courtesy; which said, let me address myself to the task im-

posed upon me—the task of showing cause and need for the existence of the Association which inaugurates to-day its public work, and of arousing, if it is in my power, your efficient sympathy in that work, that it may not remain barren and without fruit.

But here I am at once conscious of a perplexity lurking in your minds. "Why," I hear you ask, "should an organisation have been called into life for the sole purpose of considering in public, matters relating to the development and spread of art in this country? What hitherto unfulfilled ends do you seek to achieve? Do you aim at the wider extension of artistic education in this country? But vast sums from the public purse are annually devoted to its promotion; schools of art multiply, one might almost say swarm, over the face of the land. Or do you tax the great municipal bodies of England with remissness on this score? But day by day efforts in this direction among the great provincial centres of trade and industry become more marked and effectual. No announcement more frequently meets our eyes than that of the opening, with due ceremony and circumstance, and seemingly with full recognition that the event is an important one, of spacious public galleries for the annual exhibition or for the permanent housing of works of contemporary art. Or does art find private individuals lacking in that noble spirit which so often prompts Englishmen to devote to the enjoyment and profit of their fellow citizens a large share of the wealth gained by them in the pursuit of their avocations? But a great gallery of art which rises, hard by, across the road would shame and silence any such assertion. Or, again, can it be denied that what encouragement to artists is afforded by the purchase of innumerable pictures, at all events, was never more liberally meted out to them than within our generation, and does not the crowding of exhibitions, of which the name is legion, evince abundantly the responsive attitude of the country, as far at least as one of the arts is concerned? Are not statues multiplying in our streets? Is not architecture, as an art, finding at this time increasing, if tardy, acceptance at the hands of private individuals? Is not a wholesome sense dawning among us that even a private dwelling should not offend, nay, should conciliate the eye of the passer-by in our public thoroughfares; and, lastly, has not a more than marked improvement taken place within our day in the character of all those intimate domestic surroundings which are the daily diet of our eyes, and should be daily their delight? Are these not facts patent to all, and do they not seem to cut from under your feet the ground on which you seek to stand?"

Yes, all this and more may be said, and I should be blind as an observer, I should be ungrateful as one speaking in the name of artists, did I not recognise the force of these words which I have put into the mouth of an imaginary querist. I acknowledge with joy that there is in all these facts, and still more in their significance, much on which we may justly congratulate ourselves, much that points to a quickening consciousness, a stirring of slumbering æsthetic impulse, a receptive readiness, a growing malleability in the general temper, which promise well; and it is precisely such a condition of things which justifies our hope of good results from this congress, and in it we find our best encouragement.

Well, what then is our charge in respect to the present relation of the country to art? What are the shortcomings for which we are here to seek a remedy? Our charge is that with the great majority of Englishmen the appreciation of art, as art, is blunt, is superficial, is desultory, is spasmodic; that our countrymen have no adequate perception of the place of art as an element of national greatness; that they do not count its achievements among the sources of their national pride; that they do not appreciate its vital importance in the present day to certain branches of national prosperity; that while what is excellent receives from them honour and recognition, what is ignoble and hideous is not detested by them, is indeed accepted and borne with a dull, indifferent acquiescence; that the æsthetic consciousness is not with them a living force, impelling them towards the beautiful, and rebelling against the unsightly. We charge that while a desire to possess works of art, but especially pictures, is very widespread, it is in a large number, perhaps in a majority, of cases not the essential quality of art that has attracted the purchaser to his acquisition, not the emanation of beauty in any one of its innumerable forms, but something outside and wholly independent of art. In a word, there is, we charge, among the many in our country, little consciousness that every product of men's hands claiming to rank as a work of art, be it lofty in its uses and monumental, or lowly and dedicated to humble ends, be it a temple or a palace, the sacred home of prayer or a sovereign's boasted seat, be it a statue or a picture, or any implement or utensil bearing the traces of an artist's thought and the imprint of an artist's finger—there is, I say, little adequate consciousness that each of these works is a work of art only on condition—that is, a work of art exactly in proportion as it contains within itself the precious spark from the Promethean rod, the divine fire-germ of living beauty; and that the presence of this divine germ ennobles and lifts into one and the same family

\* The opening address at the National Art Congress, Liverpool.



every creation which reveals it; for even as the life-sustaining fire which streams out in splendour from the sun's molten heart is one with the fire which lurks for our uses in the grey and homely flint, so the vital flame of beauty is one and the same, though kindled now to higher and now to humbler purpose, whether it be manifest in the creations of a Phidias, or of a Michel Angelo, of an Ictinus, or of some nameless builder of a sublime cathedral; in a jewel designed by Holbein or a lamp from Pompeii, a sword-hilt from Toledo, a caprice in ivory from Japan, or the enamelled frontlet of an Egyptian queen. We say, further, that the absence of this perception is fraught with infinite mischief, direct and indirect, to the development of art among us, tending, as it does, to divorce from it whole classes of industrial production, and incalculably narrowing the field of the influence of beauty in our lives. And with the absence of this true æsthetic instinct, we find not unnaturally the absence of any national consciousness that the sense of what is beautiful, and the manifestation of that sense through the language of art, adorn and exalt a people in the face of the world and before the tribunal of history; a national consciousness which should become a national conscience—a sense, that is, of public duty and of a collective responsibility in regard to this loveliest flower of civilisation. Well, it is in the belief that the consciousness of which I have spoken is rather dormant with us than absent, waiting to be aroused rather than wholly wanting, that the founders of this Association have initiated the movement which has brought you together and laid upon me the ungracious task to which I am now addressing myself—a task I have accepted in the hope that at least some good to others may come out of the wreck and ruin of any character for courtesy which may hitherto have been conceded to me.

But let us now look closer into my indictment; and let us first, for a moment and by way of getting at a standard, turn our thoughts to one or two of those races among which art has reached its highest level, and round whose memory art has shed an inextinguishable splendour. Let us first consider the Greek race in the day of its greatest achievements and the most perfect balance of its transcendent gifts. What is it that impresses us most in the contemplation of the artistic activity of this race? It is, first, that the stirring æsthetic instinct, the impulse towards and absolute need of beauty, were universal with it, and lay, a living force, at the root of its emotional being; and, secondly, that the Greeks were conscious of this impulse as of a just source of pride and a sign of their supremacy among the nations. So saturated were they with it that whatever left their hands bore its stamp. Whatever of Greek work has been preserved to us, temple or statue, vessel or implement, is marked with the same attributes of stately and rhythmic beauty; in all their creations from the highest to the lowest one spirit lives, and whatever be the rank of each of these creations in the hierarchy of works of art, in one thing they are evenborn and kin—in the spirit of loveliness. And of the dignity of this artistic instinct, which they regarded as their birthright, they were, as I have said, proudly conscious. Would you have an instance of this high consciousness? Here is one. At the end of the first year of the Peloponnesian war the Athenians having, according to ancestral custom, decreed a public funeral to those who had fallen in battle, Pericles, the son of Xanthippus, was chosen by them to speak the praises of the dead. It is a famous speech that in which he obeyed their injunction, and it opens with a lofty eulogy of the Republic for which the heroes whom they mourned had fallen. In this magnificent song of praise he enumerates the virtues of the Athenians; he shows them heroic, wise, just, tolerant, lovers of beauty, philosophers, in all things foremost among men. Mark this! At a celebration of the most moving solemnity—in a breathing space between two acts of a gigantic international struggle for hegemony—you have here a great statesman enumerating the titles of his fellow-citizens to headship among the nations, and placing not at the end of his panegyric and as an oratorical embellishment, but in its very heart and centre these words, "We love the beautiful."

But we may gain perhaps a yet more vivid sense of the extent to which the artistic impulse possessed and filled this people in the fascinating epitome of Grecian handicraft which is presented to us at Pompeii, or rather in the Museo Nazionale at Naples. Here you have the work not of Athenian Greeks of the Periclean or of the Alexandrian age, but the work of provincial Greeks inhabiting a watering-place of no very great importance, in the first century of our era; a period as far removed from the days of the Parthenon sculptures as we are from those of the "Canterbury Tales." And what a display it is! How full of interest! Here we are admitted into the most intimate privacy of a multitude of Pompeian homes—the kitchens, the pantries, the cellars of the contemporaries of the Plinies have here no secret for us, indeed, for aught we know, more than one of those dinners of which that delicate *bon-vivant*, the nephew of the naturalist, was so appreciative a judge, may have been cooked in one of these very ranges—one of those ladles may have skimmed his soup—his quails may

have been roasted on yonder spit. Nothing is wanting that goes to make the complete armament of a kitchen—stoves, caldrons, vessels of every kind, lamps of every shape, forks, spoons, ladles of every dimension. And in all this mass of manifold material perhaps the most marked characteristic is not the high level of executive merit it reveals, high as that level is, but the amazing wealth of idea, the marvellous intellectual activity brought to bear on what we now call objects of industrial art—whatever that may mean—in this outpost of Greek civilisation. These accumulated appliances of the kitchen and the pantry form a museum of art—a museum of art of inexhaustible fascination; and not only does this vast collection of necessary things contain nothing ugly, but it displays, as I have just said, an amazing wealth of ideas; each bowl, each lamp, each spoon almost, is an individual work of art, a separate and distinct conception, a special birth of the joy of creation in a genuine artist. But, above all, let us bear this main fact in mind—the absence there of any ugly thing; for the instinct of what is beautiful not only delights and seeks to express itself in lovely work, but forbids and banishes whatever is graceless and unsightly.

As next to the Greeks, and as almost their equals in this craving for the beautiful, the Italians will occur to you. And here it may be well to note, in a parenthesis, that a vivid sense of abstract beauty in line and form does not necessarily carry with it a keen perception of shapeliness in the human frame. This curious fact we see strikingly illustrated in a race which possesses the artistic instinct in certain of its developments in a greater degree than any other in our time—I mean the Japanese. With them the sense of decorative distribution and of subtle loveliness of form and colour is absolutely universal, and expresses itself in every most ordinary appliance of daily life, overflowing, indeed, into every toy or trifle that may amuse an idle moment; and yet majesty and beauty in the human form are as absent from their works as from their persons. Be this said without prejudice to the fact that in the movement imparted by them to the figures in their designs there is often much of daintiness and dignity, the outcome of that keen perception of beauty of line in the abstract which we have seen to be dominant in them.

I need not follow further this, I think, interesting train of thought, but the digression seemed to me useful, not as illustrating the fact that beauty is not to be regarded only in connection with the human form, which is a mere truism, but as showing that the abstract sense of it, in certain aspects, may possess and penetrate a race in which the perception of comeliness in the human body is almost entirely absent; and I meet by it also, in anticipation, certain objections that may suggest themselves to you in connection with the Italians, as far, at least, as the Tuscans are concerned; for in them, too, we find occasionally side by side with an unsurpassed sense of the expressiveness of line and form, a defective perception of beauty in the human frame—witness the ungainly angularities, for instance, of a Verocchio, a Gozzoli, a Signorelli. The thirst for the artistically delightful was the mark in Italy of no particular class; it was common to all, high and low, to the Pontiff on his throne, to the trader behind his counter, to the people in the market place. And here, again, observe that this desire was not alone for the adornment of walls and public places with painting and statuary—though every wall in every church or public building was, in fact, enriched by the hand of painters and of sculptors—but it embraced every humbler form of artistic expression, and was, indeed, specially directed to one which has in our time touched, here and there, a melancholy depth—the craft of the goldsmith. I said "humbler form" of art for lack of a better word, for a craft cannot fitly be called humble which has occupied and delighted men of the very highest gifts. Did not the mind that conceived the "Perseus" of the Loggia dei Lanzi pour out some of its richest fancies in a jewelled salt-cellar for the table of a Pope? Did not the sublimest genius that ever shone upon the world of art receive its first guidance in the workshop of a jeweller—a jeweller who was himself a painter also of high renown? For was it not that painter-goldsmith whose hands adorned with noble frescoes the famous choir of Sta Maria Novella?

Now, to a cultured audience such as that which I am here addressing, these facts are familiar and trite, so trite and so familiar that it may, perhaps, be doubted whether their true significance has ever stood quite clearly before your minds, and whether you have fully grasped the solidarity of the arts—if I may use an outlandish expression—which at one time prevailed. Let us in imagination transfer the last quoted fact into contemporary life. Let us suppose that the municipality of a great English city, proud of its annals and of its culture, determined to decorate with paintings in some comprehensive manner the walls of a great public building; and suppose, further, that an artist, admittedly of the first rank, were to answer to its call from the workshop—and I say advisedly from the workshop, for it is there, and not on an arm-chair in the office, that the head of the house would have been found in the old days—suppose, I say, that such an artist came forth from some great firm of



jewellers in Bond Street, for instance, we should have, on the artistic side, the exact parallel of the case of the Dominicans of Sta Maria Nuova and Domenico, the son of Thomas the garland-maker of Florence. Meanwhile, striking as is this instance of the unity of art in long past days, it is but just to add—and I rejoice to be able here to do so—that signs are not wanting on the side of our own artists of a strong tendency towards a return to closer bonds between its various branches, in which direction, indeed, a movement has been for some years increasingly marked and practical; and it is with a glad outlook into the future, and with a sense of breathing a wider air, that I place by the side of the cases which I have just mentioned—cases which were in their time of natural and frequent occurrence—one which is of yesterday:—The chief magistrate of an important provincial centre of English industry, the Mayor of Preston, wears at this time a chain of office which is a beautiful work of art, and this chain was not only designed but wrought throughout by the sculptor who modelled the stately commemorative statue of the Queen that adorns the County Square of Winchester, the artist who presides over the section of sculpture in this congress, my young friend and colleague, Mr. Alfred Gilbert.

I have pointed to the Italians and the Greeks as culminating instances of peoples filled with a love of beauty and achieving the highest excellence in its embodiment, and I have named the Japanese as manifesting the æsthetic temper in high degree of sensitiveness, but within certain limitations. It is not necessary to remind you that I might extend this list, if with some qualification, and that the same lesson—the lesson that the nations which love beauty seek it in the humblest as well as in the highest things—is taught us by others than those I have mentioned. Whosoever, for instance, has wondered at the work of Persian looms, or felt the fascination of the manuscripts illuminated by the artists of Iran, or noted the unflinching grace of subtle line revealed in their metalwork, will feel that for this race also the merit of a work of art did not reside in its category, but in the degree to which it manifested the spirit which alone could ennoble it—the spirit of beauty. And if, further, this dominant instinct of the beautiful is not in our own time found in any Western race in its fullest force, and among one Eastern people with, as we saw, important limitations, there is yet one modern nation in our own hemisphere in which the thirst for artistic excellence is widespread to a degree unknown elsewhere in Europe; a people with whom the sense of the dignity of artistic achievement, as an element of national greatness, an element which it is the duty of its Government to foster and to further and to proclaim before the world, is keen and constant—I mean, of course, your brilliant neighbours, the people of France. Here, then, are standards to which we may appeal to see how far, all allowance being made for many signs of improvement in things concerning art, we yet fall short, as a nation, of the ideal which we should have before us.

Let me now revert to my indictment. I said that the sense of abstract beauty with the mass of our countrymen—and once again I must be understood not to ignore, but only to leave out of view for the moment, the considerable and growing number of those in whom this sense is astir and active—with the mass, I repeat, of our countrymen, the perception of beauty is blunt, and the desire for it sluggish and superficial; with them the beautiful is, indeed, sometimes a source of vague, half-conscious satisfaction, especially when it appeals to them conjointly with other incitements to emotion, but their perception of it is passive, and does not pass into active desire; it accepts, it does not demand; it is uncertain of itself, for it lacks definiteness of intuition, and, having no definite intuition, it is necessarily uncritical. This weakness, among the many, of the critical faculty in æsthetic matters, and the curious bluntness of their perceptions, is seen not in connection with the plastic arts only, but over the whole artistic field—in the domains of music and the drama, as in that of painting and sculpture. Who, for instance, where a body of English men and women has been gathered together in a concert-room, has not, at one moment, heard a storm of applause go up to greet some matchless executant of noble music, and then, five minutes later, watched in wonder and dismay the same crepitation of eager hands proclaiming an equal satisfaction with the efforts of some feeblest servant of Apollo? Or have you not often, in your theatres, blushed to see the lowest buffoonery received with exuberant delight by an audience—and a cultivated audience—which had just before not seemed insensible to some fine piece of histrionic art? And what could proclaim the lack of true, spontaneous instinct in more startling fashion than the notorious fact that the most thrilling touch of pathos in the performance of an actor reputed to be comic will be infallibly received with a titter by a British audience, which has paid to laugh and come to the play focussed for the funny? Now this little glimpse into the attitude of the public in regard to other arts than ours has its bearing upon our present subject. This same feebleness of the critical sense which arises out of the indefiniteness—to say the best of it—of the inner standard of artistic excellence, is not unnaturally accom-

panied by and fosters an apathy in regard to that excellence, and an attitude of callous acquiescence in the unsightly, which are inexpressibly mischievous; for you cannot too strongly print this on your minds, that what you demand that you will get, and according to what you accept will be that which is provided for you. Let an atmosphere be generated among you in which the appetite for what is beautiful and noble is whetted and becomes imperative, in which whatever is ugly and vulgar shall be repugnant and hateful to the beholder, and assuredly what is beautiful and noble will in due time be furnished to you, and in steadily increasing excellence, satisfying your taste, and at the same time further purifying it and heightening its sensitiveness. The enemy, then, is this indifference in the presence of the ugly; it is only by the victory over this apathy that you can rise to better things; it is only by the rooting out and extermination of what is ugly that you can bring about conditions in which beauty shall be a power among you. Now, this callous tolerance of the unsightly, although it is, I am grateful to think, yielding by degrees to a healthier feeling, is still strangely prevalent and wide-spread among us, and its deadening influence is seen in the too frequent absence of any articulate protest of public opinion against the disfigurement of our towns.

Let me give you an instance of this indifference. Our country is happy in possessing a collection of paintings by the Old Masters of exceptional interest and splendour, a collection which, thanks to the taste and highly-trained discernment of its present accomplished head—Sir Frederick Burton—is, with what speed the short-sighted policy of successive Governments permits, rising steadily to a foremost place among the famous galleries of the world. Some years ago the building destined to receive it being found no longer adequate, it became necessary to provide by some means ampler space for the display of the national treasure. It was resolved that another edifice should take the place of that designed by Wilkins, an edifice which, be it said in passing, had been made the butt of curiously unmerited ridicule in the world of connoisseurship, and which, apart from certain very obvious blemishes, it has always seemed to me to be much easier to deride than to better. A competition was opened, and designs were demanded for a spacious building, equal to present and future needs, and worthy of the magnificence of the collection it was to house. It is hardly necessary to say that we have here no concern whatever with the controversy which arose over these designs. My concern is with its final outcome, which is this: the original building has remained unaltered as to its exterior; but, on the rear of one of its flanks loom now into view, first an appendage in an entirely different style of architecture, and further on, an excrescence of no style of architecture at all, the one an Ital tower, the other a flat cone of glass, surmounted by a ventilator—a structure of the warehouse type—the whole resulting in a jarring jumble and an aspect of chaotic incongruity which would be ludicrous if it were not distressing; and we enjoy, further, this instructive phenomenon—that a public opinion which sensitively shrank from the blemishes of the original edifice has accepted its retention, with all those blemishes unmodified, *plus* an appendage which adds to the whole the worst, almost, of all sins architectural—a lack of unity of conception. Now, I have never to my knowledge heard one single word of articulate public reprobation levelled at this now irremediable blot on what we so complacently call the finest site in the world; and yet I cannot find it in me to believe that many have not, like myself, groaned in spirit before a spectacle so deplorable—a spectacle which, indeed, is only conceivable within these islands. I think that a good deal is summed up in this episode, and I need not, for my present purpose, seek another in the domain of architecture.

In regard to sculpture, the public apathy and blindness are yet more depressing and complete, and illustrate the deadness of the many to the perception of the essential qualities of art. To the overwhelming majority of Englishmen sculpture means, simply, the perpetuation of the form of Mr. So-and-So in marble, bronze, or terra-cotta—this, and no more. That marble, bronze, or terra-cotta may, under cunning hands, become vehicles for those who have eyes to see, of emotions, æsthetic and poetic, not less lofty than those which are stirred in us by the verse of a Dante or a Milton, or by the strains of noblest music—of this, the consciousness is for practical purposes non-existent. For sculpture, for an art through which, alone, the name of Greece would have been famous for all time, there is, outside portraiture, even now, under conditions admittedly improved, little or no field in our country. Portrait-statues, galore, bristle, indeed, within our streets; but the notion of setting up in public places pieces of monumental sculpture solely for adornment and dignity, or of monuments that shall remind us of deeds in which our country or our town has earned fame and deserved gratitude, and incite the young to emulation of those deeds, or that shall be the allegorised expression of any great idea—and yet our race has had great ideas, and clothed them in deeds as great—hardly ever, it would seem, enters the heads of a people whose aspirations are surely not less noble or less high than those of other nations. Nay, even a monument



commemorative of the great public services of some individual man which shall be a monument to him rather than exclusively an image of him, a monument of which his effigy shall form a part, but of which the main feature shall be the embodiment or illustration, in forms of art, of the virtues that have earned for him the homage of his countrymen—even this is suggested in vain. And if we are tolerant of treason against fitness in architecture, what shall we say of our tolerance in regard to its sculptural adornments? What shall we say of the complaisant acceptance, above and about windows and doorways in clubs, offices, barracks, and the like buildings, of carven wonders such as no civilised community would accept in silence? Though I fear I must here, with all deference, add that my brethren, the architects, who suffer their work to be so defaced, are themselves not wholly blameless; and, indeed, it is a truth, in the assertion of which the most enlightened workmen in every branch of art will stand by me, that among ourselves also the sense of the kinship of the arts is too often a mere theory, received, no doubt, with respect as an abstract proposition, but not perceptibly colouring our practical activity. In sculpture the inertness of the demand and tolerance of inferior supply is due mainly to the want, to which I have alluded, of a sense of and a joy in the purely æsthetic quality in artistic production, an insensibility to the power inherent in form by its own virtue, of producing emotion and exciting the imagination—a power on which the dignity of this pure and severe art does or should mainly rest.

In the appreciation of painting, which, on various grounds appeals as an art to a far wider public than either architecture or sculpture, the same shortcomings are evident, though in a less degree and with less mischievous results; for the witchery of colour, at least, is felt and appreciated, more or less consciously, by a very large number of people. The inadequacy of the general standard of artistic insight is here seen in the fact that, to a great multitude of persons, the attractiveness of a painted canvas is in proportion to the amount of literary element which it carries, not in proportion to the degree of æsthetic emotion stirred by it, or of appeal to the imagination contained in it—persons, those, who regard a picture as a compound of anecdote and mechanism, and with whom looking at it would seem to mean only another form of reading. Time after time, in listening to the description, the enthusiastic description, of a picture, we become aware that the points emphasised by the speaker are such as did not specially call for treatment in art at all, were often not fitted for expression through form or colour, their natural vehicle being not paint but ink, which is the proper and appointed conveyer of abstract thoughts and concrete narrative. I have heard pictures extolled as works of genius simply because they expressed, not because they nobly clothed in forms of art, ideas not beyond the reach of the average penny-a-liner. Now I know that in what I am here saying I skirt the burning ground of controversy long and hotly waged—skirt it only, for that controversy touches but the borders of my subject, and I shall of course not pursue it here. I will, nevertheless, to avoid misrepresentation in either sense, state, as briefly as I can, one or two definite principles on which it appears to me safe to stand.

It is given to form and to colour to elicit in men powerful and exquisite emotions, emotions covering a very wide range of sensibility, and to which they alone have the key. The chords within us which vibrate to these emotions are the instrument on which art plays; and a work of art deserves that name, as I have said, in proportion as, and in the extent to which, it sets those chords in motion. The power and solemnity of a simple appeal of form as such is seen in a noble building of imposing mass and stately outlines. When, however, form in art is connected with the human frame, and when combinations of human forms are among the materials with which a beautiful design is built up, then another element is added to the sum of our sensations—an element due to the absorbing interest of man in all that belongs to his kind; and the emotion primarily produced by the force of a purely æsthetic appeal is enhanced and heightened by elements of a more intimate and universal order, one more nearly touching our affections, but not, therefore, necessarily of a higher order. Thus the episode, for instance, of Paolo and Francesca, clothed in the rare, grave melody of Dante's verse, entrances us with its pathos; but our emotion, intensely human as it is, is not therefore of a higher kind than that which holds us as we listen to sounds sublimely woven by some great musician; nor are the impressions received in watching from the floor of a great Christian church the gathering of the gloom within a great dome's receding curves of less noble order than those aroused by a supreme work of sculpture or of painting—by, say, the *Notte* of Michel Angelo or the *Mona Lisa* of Leonardo; and yet in both of these last the chord of human sympathy is strongly swept, though in different ways—in the *Notte* by the poetic and pathetic suggestiveness of certain forms and movements of the human body; in the *Mona Lisa* by a more definitely personal charm and feminine sorcery

which haunts about her shadowy eyes, and the subtle curling of her mysterious lips. I say, then, that in a work of art the elements of emotion based on human sympathies are not of a loftier order than those arising out of abstract sublimity or loveliness of form, but that the presence of these elements in such a work, while not raising it as an artistic creation, does impart to it an added power of appeal, and that, therefore, a work in which these elements are combined will be with the great majority of mankind a more potent engine of delight than one which should rest exclusively on abstract qualities. And it follows, therefore, that while a work of art earns its title to that name on condition only, once again I say, of the purely æsthetic element being present in it, and will rank as such in exact proportion to the degree in which this element prevails in it; and while, further, this element, carrying with it, as it does, imaginative suggestiveness of the highest order and of the widest scope, is all sufficient in those branches of art in which the human form plays no part, the element which is inseparable in a work of art from the introduction of human beings is one which it is not possible for us to ignore in our appreciation of that work as a source and vehicle of emotion.

Every attempt at succinct exposition of a complex question risks being unsatisfactory and obscure, and I am painfully alive to the inadequacy of what I have just said. I trust, however, that I have conveyed my meaning, if roughly, yet sufficiently to shield me from misconception in regard to the special emphasis I am laying on the importance of a proper estimation of the essentially æsthetic quality in a work of art, an importance which I urge upon you not so much here on account of the effect its absence may have exercised on the development of painting, as on account of the significant fact that its want—the lack of a perception that certain qualities are the very essence of art, and link into one great family every work of the hands of men in which they are found—has led with us to a disastrous divorce between what is considered as art proper and the arts which are called industrial. I say advisedly “disastrous,” for the lowering among us in the present day of the status of forms of art in the service of which such men as Albert Dürer, for example, and Holbein (men, by-the-by, of kindred blood with ourselves), Cellini, and Leonardo, were glad to labour and create—and that not as a concession but in the joyful exercise of their fullest powers—is one of its results, and, carrying with it, as is natural, a lowering of standard in these arts, has generated the marvellous notion, not expressed in words, but too largely acted on, that art in any serious sense is not to be looked for at all in certain places—where, in truth, alas! neither is it often found—and led to the holding aloof to a great extent, until comparatively recent years, of much of the best talent from very delightful forms of artistic creation; and this notion has led further to the virtual banishment from certain provinces of designing of the human figure, or, where it is not banished, to its defacement, too often, in the hands of the untrained or the inept. We are to a wonderful degree creatures of habit, our thoughts are prone to run—or shall I not rather say, to stagnate?—within grooves; and, if we are a people of many and of great endowments, a swift and free play of thought is, as we have been forcibly told by a voice that we shall hear no more—and can ill miss—not a distinguishing feature among us. Is it not an amazing thing, for example, that human shapes, which in clay or plaster would be ignominiously excluded from a second-rate exhibition, are not only accepted, but displayed with a chuckle of elated pride when cast in the precious metals, flanked, say, by a palm tree, borne aloft on a rock, and presented in the guise of a piece of ornamental plate? But is this even rare? Is it not of constant occurrence? Do you demur? Well, let me ask you a plain question—Of all the nymphs and goddesses, the satyrs and the tritons, that disport themselves on the ceremonial goldsmithery of the United Kingdom, how many if cast in vulgar plaster and not in glittering gold would pass muster before the jury of an average exhibition? And if few, I ask why is this so? In the name of Cellini—nay, in the name of common sense—why? And is it on account of the low ebb of figure modelling for decorative purposes that on our carved furniture—what we mysteriously describe as “art furniture”—the human form is hardly ever seen? Then why is the best talent not enlisted in this work? Certain it is that the absence of living forms imparts to much of the furniture now made in England, unsurpassed as it is in regard to delicacy and finish of handiwork, and frequently elegant in design, a certain look of slowness and flimsy, faddy dilettantism which prevents it from taking that rank in the province of applied art to which it might and should aspire.

But I have, I fear, already unduly drawn upon your patience, and I must bring to a close these too disjointed prefatory words, leaving it to the accomplished gentlemen who head the various sections of this congress to amplify and enrich as they will, out of the wide fund of their knowledge and experience, the bald outline I have sketched before you. They, in their turn, taking up, no doubt, our common parable, will emphasise and press on you the fact that by cultivating its



æsthetic sense in a more comprehensive and harmoniously consistent spirit than hitherto, and with a clearer vision of the nature of all art, and a more catholic receptiveness as to its charms, and by stimulating in a right direction the abundant productive energy which lies to its hand, this nation will not only be adding infinitely to the adornment and dignity of its public and private life, not only providing for itself an increasing and manifold source of delight and renovating repose, mental and spiritual, in a day in which such resting and regenerating elements are more and more called for by our jaded nervous systems, and more and more needed for our intellectual equilibrium, but will be dealing with a subject which is every day becoming more important in relation to certain sides of the waning material prosperity of the country. For, as they will no doubt remind you, the industrial competition between this and other countries—a competition keen and eager, which means to certain industries almost a race for life—runs, in many cases, no longer exclusively or mainly on the lines of excellence of material and solidity of workmanship, but greatly nowadays on the lines of artistic charm and beauty of design. This, to you, vital fact is one which they will, I am convinced, not suffer to fall into the background.

One last word in anticipation of certain objections not unlikely to be raised against an assumption which may seem to be implied in the existence of our Association—the assumption that the evils and shortcomings of which I have spoken with such unsparing frankness can be removed or remedied by the gathering together of a number of persons to listen to a series of addresses. The causes of these evils, we may be told, and their antidote, are not on the surface of things, but rest on conditions of a complex character, and are fundamental. "Who," I hear some one say, "is this dreamer of dreams, who hopes to cure by talking such deep-seated evils? Who is this shallow and unphilosophical thinker who does not see that the same primary conditions are operative in making the purchaser indifferent to what he gets and the supplier indifferent to what he produces, and who attributes the circumstance that good work is not generally produced in certain forms of industry to the lack of demand, rather than to the deeper-lying fact that suppliers and demanders are of the same stock, having the same congenital failings, and satisfied with the same standards?" My answer to this imaginary, or I ought, perhaps, to say this foreseen, objector would be, firstly, this—that I am not the visionary for whom he takes me, and that I do not believe in the efficacy of words either directly to remedy the state of things I have been deploring, or to create a love of art and a delicate sensitiveness to its charms in those to whom the responsive chords have been refused; neither is the eloquence, trumpet-toned and triumphant, conceivable by me before which the walls of the Jericho of the Philistine shall crumble in abrupt ruin to the ground; least of all do I believe in sudden developments of the human intellect. But it has nevertheless seemed to me, as it has seemed to the framers of this Association, that words, if they be judicious and sincere, may rally and strengthen and prompt to action instincts and impulses which only await a signal to assert themselves—instincts sometimes perhaps not fully conscious of themselves—and that a favouring temperature may be thus created within which, by the operation of natural laws, in due time, but by no stroke of the wand, a new and better order may arise. Neither, indeed, do I ignore the force of my critic's contention that the causes of mischief lie deep, and are not to be touched by surface-tinkering, if they are to be removed at all; though I demur to his pessimistic estimate of them as a final bar to our hopes.

It is true that certain specific artistic attributes are, or seem to be, feeble in our race; it is true, too true—I have it on the repeated assurance of apologetic vendors—that with us the ugliest objects—often, oh, how ugly!—have the largest market; nevertheless, the amount of good artistic production in connection with industry—I purposely speak of this first—has grown within the last score or so of years, and through the initiative, mind, of a mere handful of enthusiastic and highly gifted men, in an extraordinary degree; and in a proportionate degree has the number increased also of those who accept and desire it; and this growth has been steady and organic, and is of the best augury. Now, the increase in the number of those who desire good work, and the concurrent development of their critical sensitiveness in matters of taste, stimulate, in their turn, the energies and sustain the upward efforts of the producers, and thus, through action and reaction, a condition of things should be slowly but surely evolved which shall more nearly approach that general level of artistic culture and artistic production so anxiously looked for by us all. It is in the hastening of this desired result that we invoke, not your sympathy alone, but your patient, strenuous aid. And if I am further asked how, in my view, this Association can best contribute to the furtherance of our common end, I would say, not merely by seeking to fan and kindle a more general interest in the things of art, but mainly by seeking to awaken a clearer perception of the true essence of a work of art, by insisting on the funda-

mental identity of all manifestations of the artistic creative impulse, through whatever channels it may express itself, and by setting forth and establishing this pregnant truth—that whatever degrees of dignity and rank may exist in the scale of artistic productions, according to the order of emotion to which they minister in us, they are one in kind; for the various and many channels through which beauty is made manifest to us in art are but the numerous several stops of one and the same divine instrument. And if in what I have said I have laid especial stress on that branch of art which is called industrial, it is not solely to develop this cardinal doctrine, neither only because of the pressing, practical, paramount, national importance of this part of our subject, but also because I, in truth, believe that it is in a great measure through these very forms of art that the improvement, to which I look with a steadfast faith, will be mainly operated. The almost unlimited area which they cover in itself constitutes them an engine of immense power, and I believe that through them, if at all, the sense of beauty and the love for it will be stimulated in, and communicated to, constantly increasing numbers. I believe that the day may come when public opinion, thus slowly but definitely moulded, will make itself loudly heard; when men will insist that what they do for the gracing and adornment of their homes shall be done also for the public buildings and thoroughfares of their cities; when they will remind their municipal representatives and the controllers of their guilds of what similar bodies of men did for the cities of Italy in the days of their proud prosperity in trade, and will ask why the walls of our public edifices are blank and silent, instead of being adorned and made delightful with things beautiful to see, or eloquent of whatever great deeds or good work enrich and honour the annals of the places of our birth. And, lastly, I believe that an art desired by the whole people and fostered by the whole people's desire would reflect—for such art must be sincere—some of the best qualities of our race; its love of nature, its imaginative force, its healthfulness, its strong simplicity.

And now, ladies and gentlemen, my task is ended. My duties to-night were purely prefatory; my words are but the prologue to the proceedings which begin to-morrow—a prologue which I undertook to speak less from any faith in its possible efficacy than in the belief that the first word spoken at such a time should be heard from the lips of one to whom, from the nature of the office he is privileged to fill as well as from the whole bent of his mind, everything that concerns art, from end to end of its enchanting field, must be, and is, a source of deep, of constant, and engrossing interest. The curtain is now raised, the stage is spread before you, and I step aside to make way for others, leaving with you the expression of my fervent wish that the hopes which have brought us together in this place may not have been entertained in vain.

## ILLUSTRATIONS.

### ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 46.—THE GORDON MEMORIAL, TRAFALGAR SQUARE.  
[HAMO THORNYCROFT, R.A.]

ON THE GRETA, YORKSHIRE.

BORASTON CHAPEL.

THIS is one of the two ancient chapels of the parish of Boraston, part of the manor of Burford, on the southern extremity of Shropshire. A chancel and vestry have been added, a substantial bell-tower and porch built, and the interior refitted to seat 143 persons.

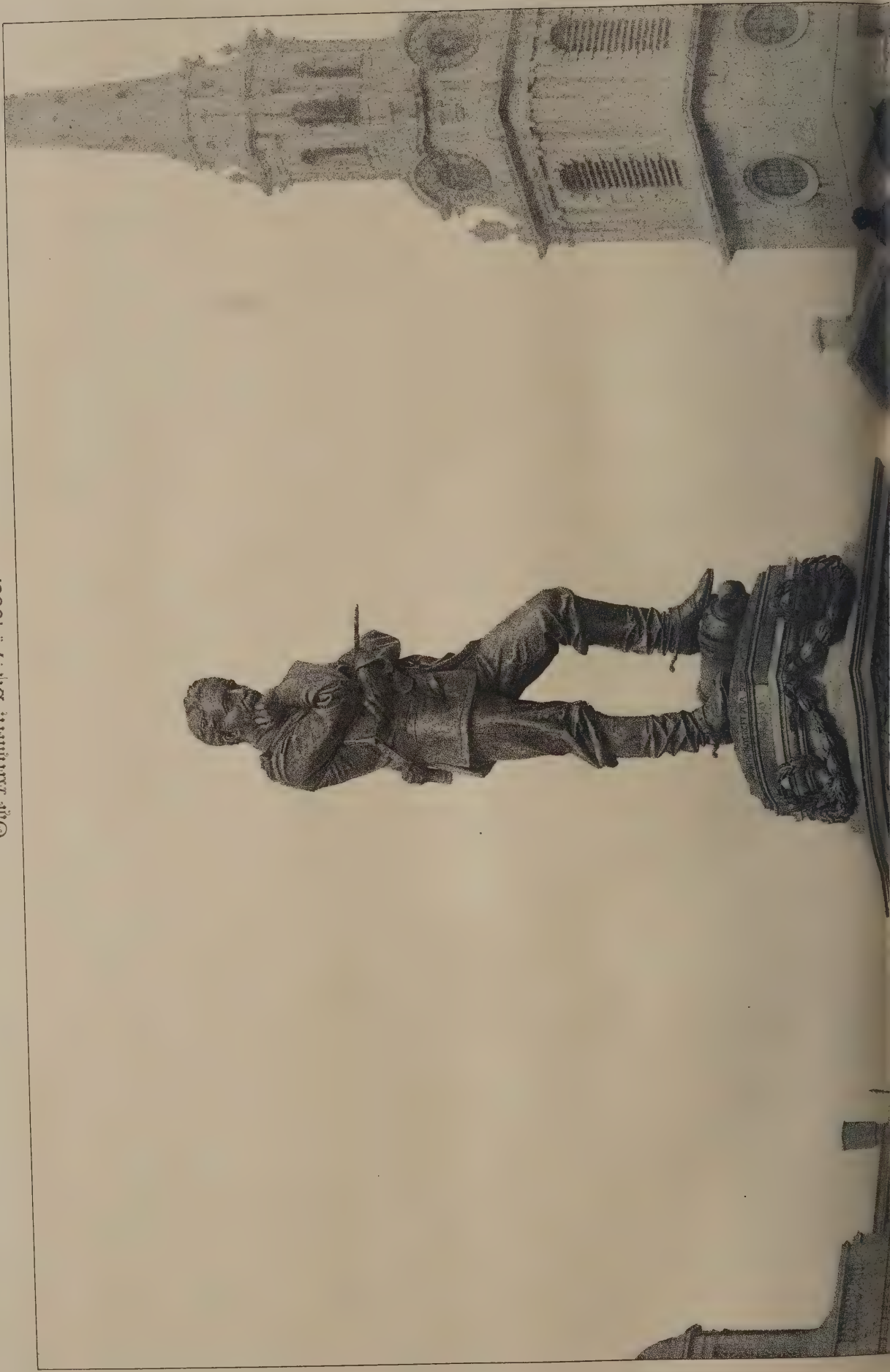
The old walls are Norman, and batter considerably inside and slightly on the exterior. There remain traces of two doorways of that period, but the mouldings and face of the ancient masonry have long ago been hacked off and the surface stuccoed. The walls were raised, or rebuilt at top, with ashlar walling in the fourteenth century, and there are two windows of this date. These, the only ancient features remaining, have been restored, some of the stones being undisturbed. The external stucco was very readily removed, exposing the pleasant warm colour of the ancient red sandstone ashlar. The belfry, spire, and porch are entirely of local oak, given by the late Lord NORTHWICK. The spire is covered with cleft oak shingles. The pulpit, screen, and chancel fittings are also of oak, and handsome in character. Some of them were made by Mr. JAMES FORSYTH, of Hampstead, from the architect's designs. We give an illustration of the pulpit. The architect was Mr. CURZON, of Lincoln's Inn Fields, and the builder Mr. W. HOWELLS a parishioner.







Lehr Architect. Dec. 7<sup>th</sup> 1888.







"INK PHOTO," SPRAGUE & CO. 22, MARTIN LANE, CANNON ST., LONDON, E.C.

STATUE WITH PEDESTAL - TO GENERAL GORDON, TRAFALGAR SQUARE.

M<sup>r</sup> HAMO THORNYCROFT, R.A. Sculptor.

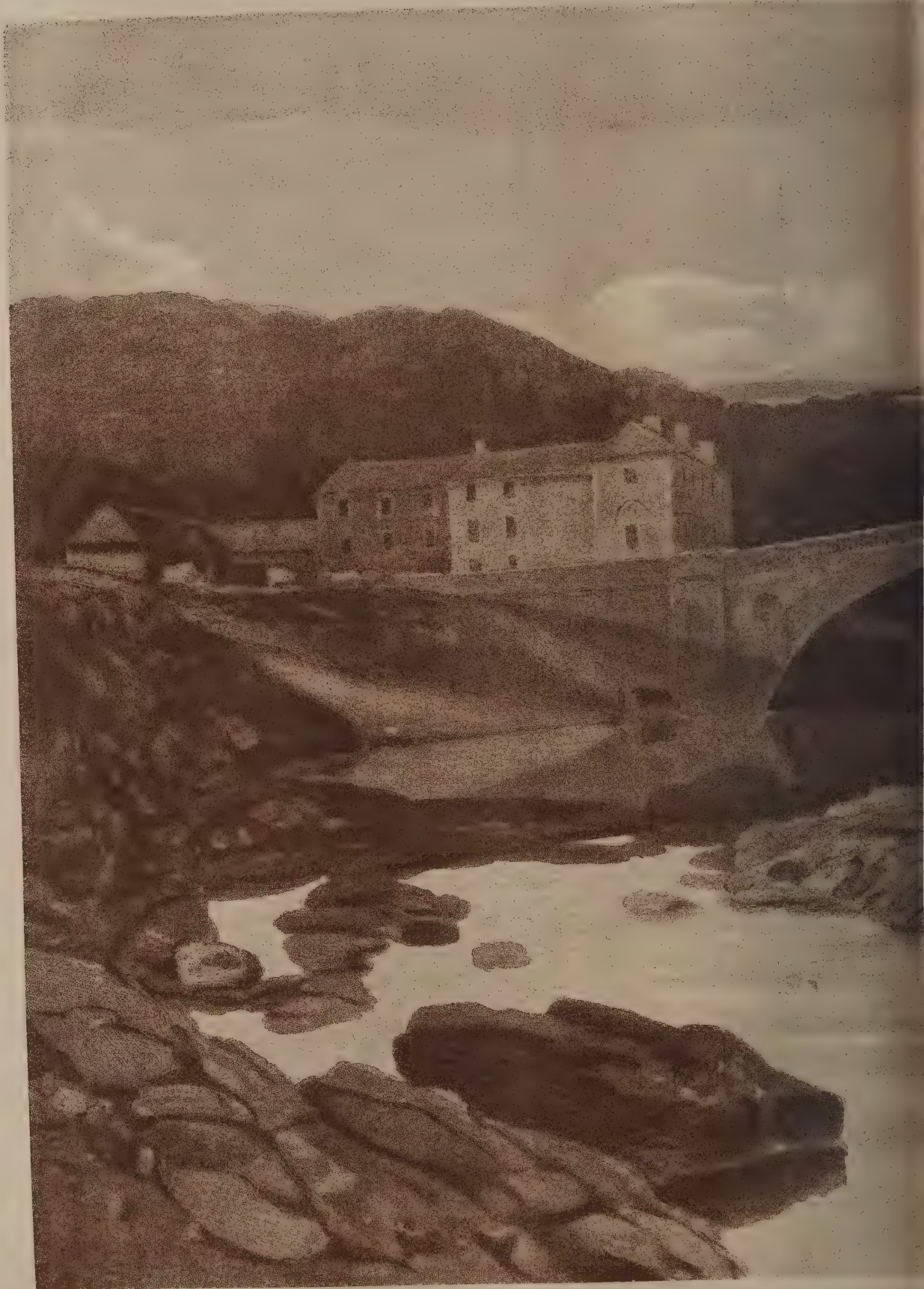








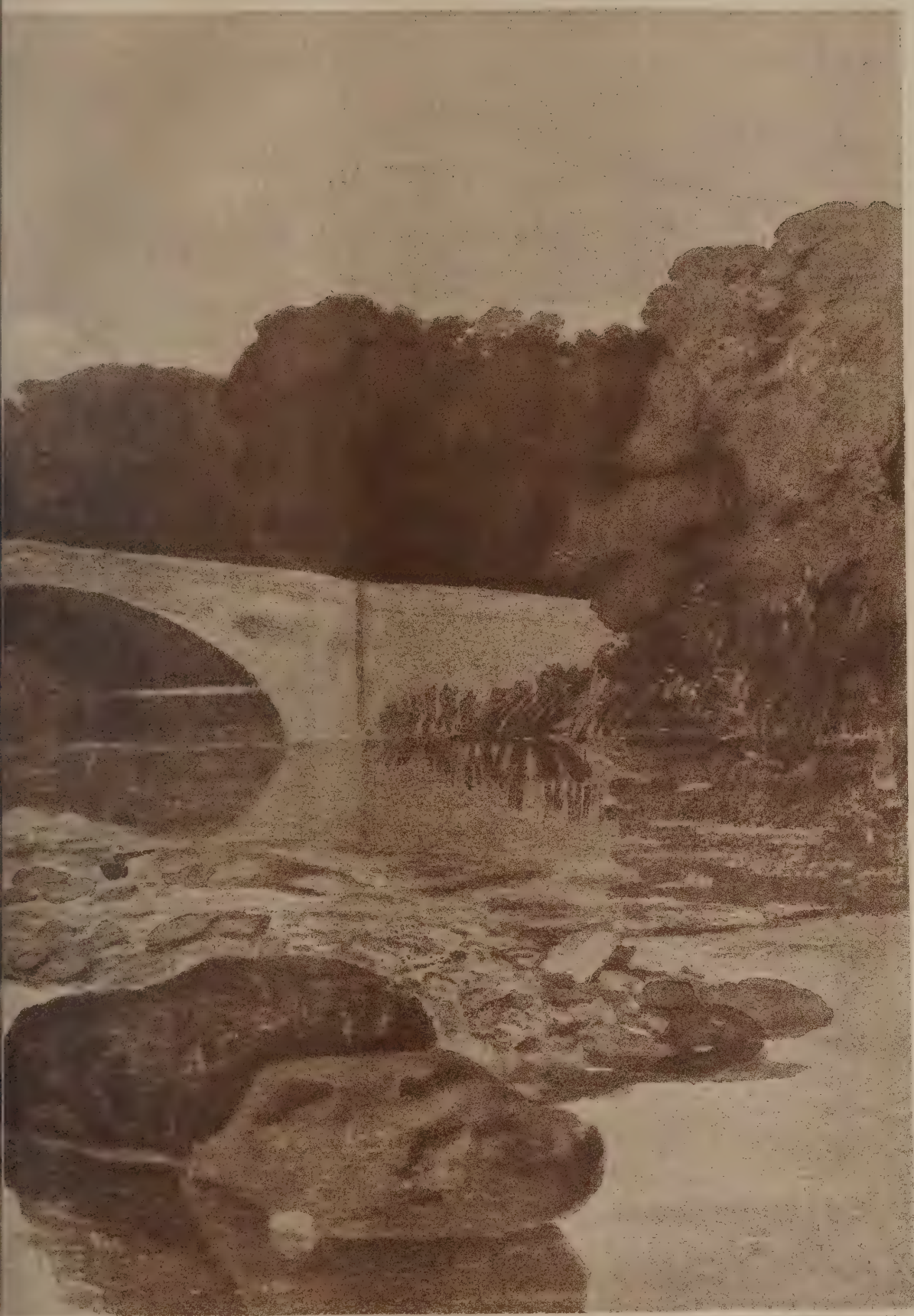




ON THE GRE  
by JOHN  
From the Drawing by



7<sup>th</sup> 1888.



INK PHOTO, SPRAGUE & CHASE, NEW YORK, N.Y.

YORKSHIRE.

COTMAN.

to James Reeve Esq

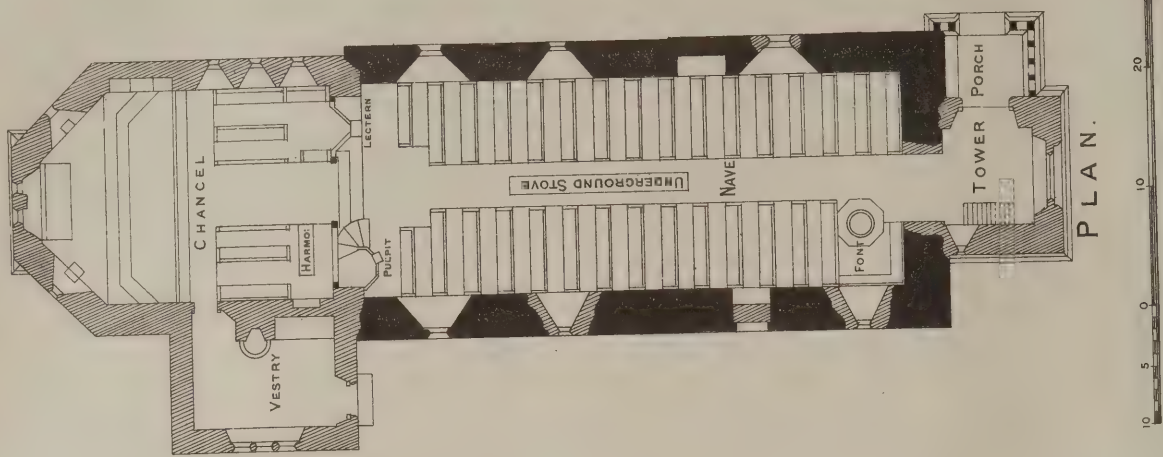
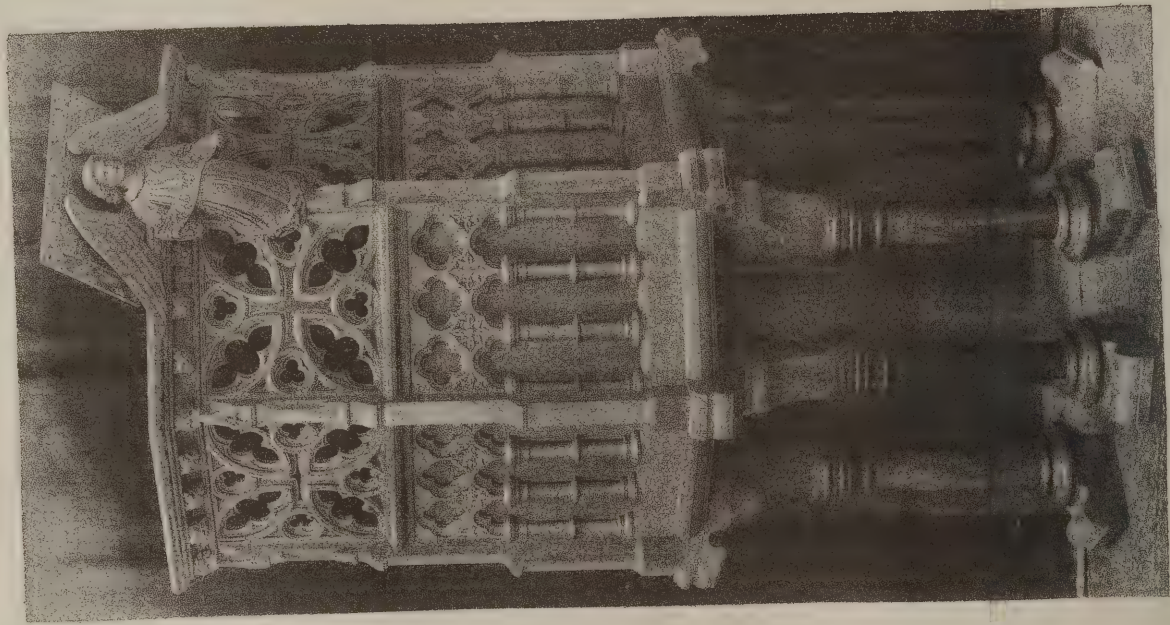




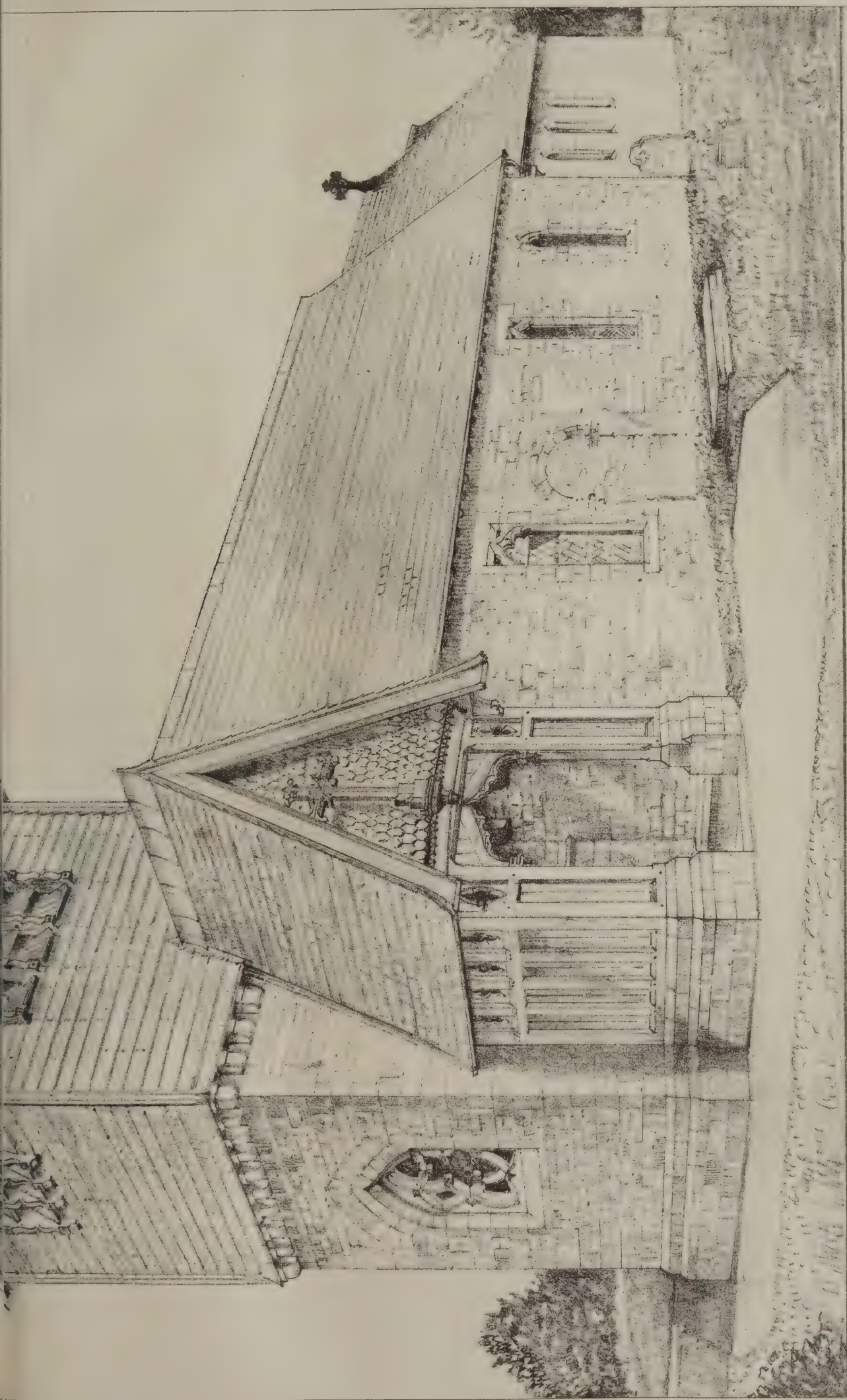












— Boraston: Chapel: Staircase & Porch built A.D: 1887: — Henry Curzon: Archt: —







## NOTES AND COMMENTS.

THE report of the meeting of ROBERT BOYLE & SON, Limited, which we published last week, is gratifying for several reasons. When a company that is so closely associated with building can declare a dividend of 12 per cent., it is evident that the building trade in general is reviving, for it may be assumed that a large share of the profit was derived from the ventilation of public and private buildings recently constructed. We may also conclude that the demand for ventilators is increasing. That is partly owing to a more general recognition of the fact that air should be removed constantly if a room is to be kept in a habitable condition, but we must also say that the very low price at which the air-pump ventilator is available has no small influence upon the ideas of the public about sanitation. It is no longer necessary to have an apparatus which, however doubtful may be its efficiency, is cumbersome, costly, and promises to be a cause of expense. The air-pump ventilators made their way because they were simple in principle and were without any cause of weakness which would interrupt the uniformity of their action. Improvements were effected from time to time both in the form of the ventilators and in the processes for their production. By means of those which are protected under the patent of 1882, Mr. ROBERT BOYLE was able to announce at the meeting that the cost of the air-pump ventilators is now 50 per cent. under former prices, with the advantage of increased efficiency. As steel has superseded wrought-iron in other fields, it now is used for the ventilators, and the lightness and toughness of the material may be expected to produce more grace in the form of the ventilator. The business of the company is increasing not only in England but abroad. Every one who is aware of the severe tests which are imposed on appliances before they are used in the public buildings of the Continent will recognise the foreign successes of the ventilator as one of the best guarantees of its effectiveness as an air-changer.

THE skill of Mr. RICHARD BEAVIS in painting animals was recognised long ago, but few would credit him with being also a landscapist and a colourist. The pictures and studies of Spanish subjects in Messrs. TOOTH's gallery will be a surprise to many amateurs. They form a delightful exhibition, for in looking at them one feels the competence of the artist to put on canvas any scene or figure which gives him pleasure. There is no straining after novel effects. Mr. BEAVIS frankly renders what he saw on bright days, and the smallest sketch will seem to convey some sunshine to a room on a dark day. The marine paintings are as successful as those of mountains, except one where a three-master sails perilously near the shore. As was to be expected, there are pictures of Spanish horses, bullocks, mules, sheep, and goats, and, of course, scenes from a bull-fight. Mr. BEAVIS was lucky in having a day when horses were used for the *corridas* which were worth drawing, and when the *alguacil* did not seem to be an undertaker's assistant. His *Collecting the Fighting Bulls* is one of his best pictures. Among the landscapes we may mention *Tilting o'er the Wave, Where Guadalquivir's waters glide, Barcelonetta, Mont Sevos, Bridge over Ebro, and the Torre des Infantas*. In the last the delicate pink of the Alhambra brickwork is caught. But every one of the fifty-five pictures will sustain a scrutiny.

M. PAUL FOUCART, the Director of the French School at Athens, has reported to the Académie des Inscriptions that excavations on the site of the Temple of the Muses at Thespeia, have been commenced. He has placed M. JAMOT in charge of the work. In the course of eleven days the substructure of the temple has been exposed, and among the discoveries are Ionic capitals, fragments of bronze, several inscriptions, some of them relating to the dedication of the statues erected by the Thespeians in honour of SYLLA, AGRIPPA, &c. The works are to be continued whenever the weather is favourable. Thespeia was said to possess a theatre and agora which were worthy of inspection, and statues of *Venus, Cupid, and Phryne*, by PRAXITELES. PAUSANIAS also mentions two temples, a naos, and twenty-two statues. In the beginning of the present century the ground was visited by DODWELL, and he remarked that valuable antiquities and inscriptions might

be found there with a little trouble and expense. The French archæologists have apparently done well when they decided on an exploration of Thespeia.

At the meeting of the Manchester Architectural Association on Tuesday there was a discussion upon "The Improvement of the City," after the manner of one which took place lately in a Manchester Club. The following resolution was afterwards adopted:—"That this Association respectfully recommend to the corporation the formation of a committee composed mainly of gentlemen outside the corporation whose duty shall be to advise on all artistic questions connected with street improvements." The proposal is a good one, but after the Metropolitan Board's experience of what the Royal Institute of British Architects contrived to do with Northumberland Avenue, the Manchester Corporation may be pardoned if they hesitate about the adoption of the resolution.

AN international competition is opened for designs for a Musée in Gothenburg, Sweden. The treasures which are to be housed consist of works of art, coins and medals, natural history, books, ethnographic and archæological objects. It is left to the competitors to decide whether there is to be a single building for all the collections, or separate buildings. In the latter case it is prescribed that the works of art, specimens to illustrate natural history, and the library should occupy the principal parts of the buildings, and that provision should be made for ulterior enlargements. Fireproof materials are to be used, with stone for the façades. The sum to be laid out, including ventilation, lighting, heating, water supply, architects' fees, &c., is put down at 1,200,000 kronen, or about 66,700*l.* The designs are to be sent in to the directors before January 1. The first prize will be about 133*l.*

THE painters of Vienna are not forgetful of the fate of MARIE ANTOINETTE under the Revolution, which the International Exhibition next year is to celebrate. They have held a meeting at which it was decided that they will not be contributors to the galleries. This resolution is to be regretted, for by it M. MUNKACSV's pictures will be excluded, and there are several other artists whose works would be among the attractions of the Exhibition.

EVERYONE who was acquainted with CHARLES HANSOM, of Bristol, will regret the loss of one who was not only an able architect but a generous and most honourable man. He died at his house in Clifton on Friday last. Until recently Mr. HANSOM always seemed to be in the best of health, but in the beginning of the year cancer appeared, and eventually he succumbed to it. For nearly half a century he was a prominent man among the Roman Catholics, and erected many churches, convents, and schools for them throughout the country. He was one of the pioneers in the revival of Gothic and throughout his life he gave preference to the Decorated period. As far back as 1842 he erected a church in Coventry, and it was followed by others at Erdington, Edgehill, St. Ann's, Wolverhampton, York, Cardiff, Selby, Rugeley, Thurnham, Kenmare, Boulogne, Cheltenham, Bath, Clifton, &c. His Dominican Priory at Woodchester is one of his most admired works. The convents at Clifton, Stowe, Stoke, Loughborough, Taunton, Woodchester were erected from his designs, as well as Ratcliffe College, the central block of Downside College, the library at Ushaw. Among his recent works were the Clifton and Malvern Colleges, and Kelly College, Tavistock. He also was architect for the present church of St. Paul, Clifton, and the church at Barton Hill. Mr. HANSOM was full of energy, and naturally was enthusiastic about the Volunteer movement. He held a captain's commission in the local artillery corps, and a book of his on "Company Drill" was at one time recognised as an authoritative manual. With his fine physique and love of exercise, CHARLES HANSOM would be considered as likely to live to a patriarchal age, and, as long as he practised, he would be an honour to the profession. Mr. HANSOM was buried on Monday, and, at the desire of the local clergy, near one of his mortuary chapels in the Bath Cemetery.



## ARCHITECTURE AT THE ART CONGRESS.

IN the section of Architecture Professor Aitchison presided. In the opening address he observed it was said that it was not perhaps extraordinary that so little attention had been paid to the fine arts in England until lately, because the discovery of some of nature's laws and the application of those laws to machinery had created a state of things that never existed before. There were only two sections of mankind that were content to exist without architecture—the lowest savages and those who were in most respects the most highly civilised. The former were contented with the caves or lairs of wild beasts, while the latter only asked for buildings that met their more complex physical wants, but destitute of everything that appealed to their higher nature. The object of his address was to try and lift the civilised man from that state. Pure architecture, like music, might enthrall or entrance, but like music it was vague. Architecture and music were obtrusive arts. In one respect architecture had the advantage, for they might admire it in a desert, but without man or animals music almost ceased to exist. The fairer half of the population were taught the principles and practice of music from their early years; but who studied architecture, who knew the notes, who had learned counterpoint that he might be able to follow the intricacies of harmony through a building? And yet he presumed there were natures as capable of being enchanted by it as by music if the same training were bestowed. He asserted that the present parsimonious way of treating architects rendered it impossible to get the most highly finished they could design and workmen execute, and he said it was perfectly true that among the mass of the people there was no taste for architecture. Architecture supplied that grace to our habitations and that dignity to our public buildings that should be as necessary to our life as the air we breathe; the inside of our houses should be so graceful in form and so beautiful in colour as to restore to us the requisite calmness of mind that strife with the world or close application had robbed us of. And that the outside should be shapely and rhythmical was a debt due to the public. As a nation they sank in the scale of civilisation if they had nothing to show in their towns and capital but utilitarian ugliness, and they would have nothing to show of their former greatness, nor of the extent of their dominion, if they left behind them no buildings worthy of admiration and study. The Professor then spoke of the necessity and importance of building with that excess of strength and with that permanence that would resist the ravages of time. They would realise the importance of architecture if they considered the blank that would be left in sculpture and painting by expunging the architecture, and in literature by omission of all reference to it. Architecture, therefore, claimed more study and more appreciation. The rich and well-to-do might well reflect that it was not a perishable art, and that a magnificent mansion or public building might keep alive their name for centuries, when it would otherwise pass away with the generation in which they lived. There was often both a pecuniary and social advantage in magnificent architecture and decoration. But he rather insisted upon the public advantage as well as on the personal pleasure to be gained by the study and appreciation of noble architecture, even by those who could not afford to build, for their knowledge and appreciation would encourage a higher and deeper professional study, and would reward its success.

Sir James Picton said he hoped the congress would have a tendency to bring about that progress which was certainly needed in Liverpool in regard to the fine arts.

## Safety in Theatres.

Mr. E. J. Tarver read a paper on "Proposed Improvements in Theatre Planning," in order to show that fatal accidents occurred in theatres chiefly because people, when rushing out, were pent up between the enclosing walls of passages and staircases, and therefore the Legislature might enact a regulation that such passages and staircases should not be one inch longer than was necessary for traversing the distance between any seat in the house and the street doors. Mr. Tarver illustrated by means of a series of practical diagrams a means of shortening this distance to a minimum without sacrificing any of the requirements and comforts of the audience. He claimed that the number of seats, and consequently the profits of the management, were much increased by his plan, which had stood the test of criticism, and had met with the approval of those who were practically and professionally acquainted with the subject.

## Colour Theories and Experience.

Mr. G. H. Morton, jun., read a paper on "The Agreement of Colour Theories with Practical Experience." He expressed his opinion that a large number of British workmen and women might gain a livelihood from occupations in art works now done abroad were they but better educated in the matter of colour and design. This was mainly due to their neglect in

not studying the subject, and so learning to discriminate between the harmonious and the inharmonious and the pleasing and the unpleasant. A knowledge of the scientific rules of colour seemed to be much more needed in decorative than in picture-painting. Mr. Morton then gave a technical exposition of the combinations and effects of primary and secondary colours and pigments.

## Colour Decoration.

Mr. J. D. Crace read a paper on "The Proper Aims and Limits of the Coloured Decoration of Architecture." He said that although both architecture and decoration had in modern times been to some extent the playthings of fashion, the serious study of harmonious colouring had kept pace with the new development of architecture, and the art which had so nearly died out early in this century had started into fresh life. There were, however, numbers of able designers and ornamentists, although there were very few men who could so grasp the colour treatment of a large building as to add to its dignity and repose. There was, Mr. Crace remarked, an unfortunate tendency to undervalue the teaching of the historic past in art. This was partly due to the fact that so few leading artists had any knowledge of "architecture" or "applied art," and another cause was to be found in the charm of the Japanese art, although it should be remembered that that was the art of a people who had no architecture. The gravest impediment to "decorative art" was the existing separation between it and so-called "high art"—a separation quite as injurious to the latter as to the former.

## PAINTING AT THE ART CONGRESS.

MR. ALMA TADEMA, R.A., in his inaugural address to the members, said that it was with great pride that he had come to Liverpool to preside at the Painting Section of the National Art Congress, which the distinguished President of the English Royal Academy of Arts had opened with such a characteristically admirable address. Pictures were his usual means of communication with the public, and as he had somewhat neglected that study of the word which insured clearness of expression, he could not hope to convey as much to his audience as he trusted he had sometimes succeeded in doing through his pictures. The artist's highest aim and necessity were to convey to his fellow-creatures the impressions of beauty which he was constantly receiving, and which dominated his life. Those impressions varied with the individual. Some were sensitive to colour, others to forms, others to sound; and, according to the nature of his susceptibility, a man became a painter, a sculptor, an architect, or a musician. Still those different artists all belonged to one class of human beings—those whose calling it was to point to the beautiful, the elevated, the refined, and by so doing to heighten the existence of mankind. What sorrows, what sufferings were not alleviated by the charms of art? Who could listen to music in a beautiful cathedral without being uplifted? Who could stand unmoved before a masterpiece? If such a one was to be found, surely he must belong to the lowest of intellectual grades. These high sentiments were indefinable; it stood to reason, moreover, that they were felt in different degrees, since no two individuals were similarly affected, even by a common cause. It must be understood, however, that there was a standard by which art could be measured—the sanction of time and of nations. Thus they could not doubt the pre-eminence of Phidias, greatest among the great in the loftiest period of art—the time when Pericles ruled Athens, and Athens was the undisturbed head of Greece. Form had then attained its highest development. As for colour, its principal use was then to decorate architecture and sculpture, for the Greeks, they were told, painted their temples and statues, the latter probably in order to give them a more life-like appearance. We who were used to treat sculpture as an art complete in itself, and who had never seen any first-class statuary assisted by colour, found it difficult to imagine that this combination, of which the ancients were so fond, could have been satisfactory. Under the Romans art became still more realistic in form, more individually natural, and consequently more picturesque; a sense of colour was developed, which appealed more strongly to our sympathies. Mr. Tadema went on to say that play was essential to colour, and that play in form, if it did not actually destroy, at least did not add to its beauty. He continued:—Still the sacrificing of form to colour is in some ways a loss to art, and, strange as this may sound from a painter's lips, leads to inferiority. The Parthenon, the Erechtheum, could have gained nothing or very little by the addition of colour; the Byzantine architecture stands in need of purity and elevation of form. The research of the natural has dealt destruction to sculpture. Expression, as in the *Laocoon* or the marbles of Pergamos, destroys grandeur and beauty of expression; and works of that tendency cannot be mentioned in the same breath as the *Venus of Milo*, or the sculpture of the Parthenon, where all is passive. The Middle Ages, with their love for life and



man, began with the soul and produced painters above all. We have followed their lead, drawing closer to nature still; and it must be admitted that sculpture is no longer the leading art, as it undoubtedly was in antiquity, although in many instances, through tradition or for monumental purposes, we may still produce some very commendable sculpture. But it is a distinguishing feature of our age that we seek human individuality rather than symbol, and symbol being the soul of sculpture, its loss is detrimental to the art. But, to go beyond portraiture, the painter has at his command a still higher expression of art—flights to which no sculptor can aspire. I refer to those grand compositions of which the Sistine Chapel, by Michel Angelo, and the *Stanza*, by Raphael, are the highest examples. Next in order to these monumental works must be classed the picture proper, of which many examples, however, belong to the same category as the above. Pictures may be considered as the outcome of a change in the nature of art protection, Church and State having made way for the private individual, a necessary result of modern progress, especially in England, which owes its grandeur and freedom in a large measure to the development of individual action and power. But, although everybody does not possess a monument which may be decorated, everybody has wall-space sufficient to hang a picture on; thus small paintings have come into request, and are perhaps more so now than ever. That the grandeur of art has suffered by this is undeniable, but in all other senses it has been developed by this universal spreading of its influence: in any case the field of operation has become much larger. Landscape-painting above all, an essentially modern branch of pictorial art, and one in which our own painters have excelled, owes its development, if not its existence, to this state of things. We modern men and women love to breathe the open air, can find a poem in a sunset, a sunrise, a calm sea, or a storm; and we have painters who are nobly inspired by subjects which in former times would not have been classed among those belonging to the high realms of art. From the passion and loveliness of human beings, we have come to understand the passion and loveliness of nature; and in this new field daily triumphs are performed. Since the days of Holbein and Vandyke our national art has made great strides; our masters hold their own in every place. When the Continent was disturbed by Classicism and other tendencies, we suffered less from their influence. It was the teaching of our great portrait-painters that produced the Romanticism which Bonington transplanted into France; and, as I once heard Daubigny himself say, it was our landscape-painters that taught the French how to interpret nature. Let us proceed on this high road. Work, study, and put all the forces to the front, in order that we may become what we ought to be—the very first.

#### Encouragement of Local Art.

Mr. J. Towers, in his paper on this subject, said he included under local art not only the art produced by painters residing in Liverpool, but also the work of those artists who, though residing at a distance, were Liverpool men, and made this city the centre towards which they turned for support and encouragement in their work. A Liverpool school of painters—well trained, industrious, earnest, and enthusiastic in their work, supported by liberal and judicious patronage, and guided by the just and generous criticism of men of culture and refinement—would add to the reputation of Liverpool as a great art centre. At present the Liverpool painters were not deficient in natural ability, and if encouragement and fair play was given to them the city would reap the benefit in becoming the home of a Liverpool school of painters, of whom their fellow-citizens might be justly proud. But an artist may be well trained, may possess ability, and may be fortunate in having his works well placed at the exhibitions, and yet, if he lack a purchaser, unless he be a man of independent means, he would be unable to advance in his profession. For in art, as in other things, nothing could be done without money. This raised the question, How can our wealthy men best make use of the means at their command to encourage local art? He thought they could best do this by being liberal with their patronage towards those artists who showed by their pictures that they were really striving to do good and conscientious work, and that any encouragement they received would not be thrown away, but might be the means of enabling them to do greater things. Commissions might be given to local artists to paint portraits or landscape views, or to illustrate subjects suited to the brush of the painter.

Mr. Bruce said that he objected to the term used in the paper, "local art," for art was not local: it was a provincial patriotism to attempt to localise art. Art belonged to the whole world; it was not of any country, or of any one particular school; it was above and beyond all that.

Mr. Wardlaw Laing said that the title of the paper would have been more appropriate if it had been "Encouragement of Local Artists." The great point they had to consider and strive after was to remedy the want of appreciation on the part of those for whom art was supplied; they wanted to make the

whole body of the public appreciate art, just as in the days of Greek art the whole of the people appreciated the artistic beauties around them. He did not believe that art would flourish unless the artist himself was brought into constant contact with the persons for whom the art was produced.

#### Cultivation of the Love of Art.

Mr. James Patterson read a paper, in which he said there was something surely wrong in the system of education at the present time, when they found that the popular feeling had become perverted, and that the intelligent appreciation of the really beautiful was rare, while ugliness in sight and sound and speech was quietly acquiesced in. The unqualified wrong-headedness of current misunderstanding of art questions must be attributed to the arrogance and ignorance of many of those who consider themselves the only competent authorities on the subject. The degradation of political life in the United States was largely attributed to the abstention of the intellectual from its commonplace everyday struggles. Might not a parallel be found in the abuses which tarnished the art life of this country? For the attitude of the general public was the result of the filtration downwards of the ultimate decisions of cultivated men and artists. The present exhibitions of pictures were practically valueless as sources of education, and to the general unthinking public they were injurious, for they visited such exhibitions to be amused, or at the best greatly interested; and amongst the good, bad, and indifferent pictures in a gallery there was the danger of their choosing the two latter, and neglecting the former. The spirit of art was not dead, could never die, and they could all, however quietly, contribute towards keeping it alive in their own day. Let them take pride in their profession, and scorn every temptation that would sully its high aims. Art should not be a luxury or fad for men of means and leisure, but a great factor in the elevation of a people, rendering life not only fair and beautiful, but memorable to the end of time. Let them look forward to and strive for the day when ugliness will have become an impossibility, and when a thing without beauty will be regarded as a foul lie.

#### SCULPTURE AT THE ART CONGRESS.

THE section of Sculpture was under the presidency of Mr. Arthur Gilbert, A.R.A. At the first meeting on Monday, he said he considered that the direction of the deliberations in the section should be rather towards determining how they might serve the interests of the plastic art, not so much from the statuary's point of view as from that of its application to the production of those objects of everyday use to which they must look to encourage the taste for beauty, and cultivate it to such a degree that the plea of utility should no longer be tolerated as an excuse for its absence, nor accepted as its substitute. It was the object of the Association under whose auspices they were met, to help to bring about that prosperity and welfare of the arts—fine and applied—in our country, which to other countries, in every age, had been their greatest and most lasting glory. He expressed the disappointment they must all feel at the absence of Mr. Watts, R.A., whose long, faithful, and earnest career in the service of art had already borne fruit, and would in time to come call forth the gratitude of his countrymen for the position his efforts, as painter, poet, and sculptor, would entitle this country to take with those countries whose art traditions were older, and whose advantages had been greater. He then read a communication he had received from Mr. Watts.

#### Necessity of a National Effort to Popularise Art.

In his letter, Mr. Watts said he regretted that want of health prevented him from being present on so interesting an occasion, and said he should like to let his fellow-members of the Association know how largely his sympathies were with them and that true service to art which he believed this movement was likely to render. The importance of making the aims and principles of art more generally understood could not be overestimated, and if by these meetings the already considerable body of lay workers could be increased, it might be regarded as one of the most hopeful signs of the age. All over the world joy in beauty as an instinct was coming to an end, as in our country—crushed by the wheels of machinery and forgotten in the competition for wealth. There was a time when temple, dwelling-house, or workshop gave to any surroundings, however beautiful, the additional beauty of human interest; now, our factories, our villas, and our cottages were sores upon the face of nature. "Trees is ornaments, and we don't want no ornaments," was the answer made to the Laureate's remonstrance against cutting down some fine old trees which, by a little care, might easily have been spared to be the delight of the dwellers in the ugly villa then being constructed. To prove that this answer, though ignorant, is typical of the spirit of the age, he might refer to Royal Windsor, from whose terraces one looked with astonishment at the desecration of one



of the loveliest spots of England, and in one of the loveliest reaches of the Thames, by a bridge as ugly as it was possible to make it. While the eye of the modern man was denied so much real and ennobling pleasure, the vitality of art also languished to extinction. They should make a stand against the notion that art, as an expression of ideas, emotions, or pleasures, should be left to professors alone. It was formerly a natural expression of impulses, as much naturally used as limbs were still used; now it was as though these natural means were never to be employed excepting by paid agents. It should be as much the object of those who had influence to retain and develop the natural sources of interest and outlets of often little comprehended impulses, as to encourage physical exercises. The stumbling-block to the English was the practical; everything that did not present the idea of immediate advantage seemed to be impractical. "Man shall not live by bread alone." Never was a saying more profoundly wise, even when applied to material conditions; never a truth so little comprehended by the practical mind. For this reason he gladly hailed the accounts of the ever-increasing band of volunteer labourers, endeavouring by all possible means to open the eyes and minds of the people to a knowledge of this forgotten pleasure; teaching the boys and girls of our villages and towns to take a delight in some simple artistic occupation, showing them the beauty of a sweep of landscape, or the grace to be found in the lines of a coil of rope. Till the love of beauty was once more alive amongst us there could be little hope for art; it was a universal language; everything we used or wore was an expression of it or absence of it. The art that existed only in pictures and statues was like the religion kept only for Sundays. To all work which had for its object the rooting of art amongst us he felt sure this Association would give the greatest possible stimulus. The task of the professors of art was a difficult one. They were in the position of a poet told to write on some noble theme in the language of the slums. Painters and sculptors are asked to perpetuate noble and gracious lives, while their portraits were at once deprived of both these qualities by a costume ignoble and ungraceful in every line. The criticism they had to encounter, too, was often that of ignorance, the work itself suffering from the numerous drawbacks arising out of the system of modern exhibition. Altogether, to those who considered the matter, the difficulties of art and the ambiguous position it now occupied awakened many depressing reflections. In the midst of these hindrances the artist much needed the encouragement of fellowship, and of being reminded that he was giving his life to a noble and beautiful work, worthy of all his heart's love, worthy of his first thought in the morning and of his last at night. Whether it was that his special talent enabled him to stand as an interpreter of what was loveliest in nature or highest in man; or whether it was that the world was made merry by the wit and humour of his pencil, or thoughtful by its suggestive irony; or whether it was that he spoke to the imagination as a poet in language as noble, as forcible, as suggestive; or whether it was that his genius led him to do what had been done in civilisations that had passed away, and wrote in bronze or marble the most abiding record of what was best and noblest in his age. He felt very strongly that our days of political prosperity and power were passing away, and that the future would know us better from the impress, they left by moral character, intellectual efforts, by poetry and by art, than by wealth and political position.

#### The Importance of Sculpture in Civilisation.

Mr. George Simonds read a paper in which he said that in dealing with this subject he would have to speak of the conditions which constituted a state of civilisation, of how those conditions arose, of what influences accelerated or retarded their development, and lastly of what share art, and more particularly sculpture, had in their development. It was the object of his paper to show that art was not a toy or plaything, and that sculpture was not a mere luxury for the rich, nor even a superfluity that humanity could well do without. He maintained, on the contrary, that sculpture in some form was a necessity to civilised man, and that art was, if not civilisation itself, at least the strongest civilising power; yes, stronger even than religion, for art was not stained with the crimes of an Inquisition, nor had her influence ever been exerted to check the development and freedom of thought. Yet, so thankless and so blind had mankind become that art was slighted and neglected, and people prided themselves chiefly in what they were pleased to call their modern progress in civilisation. These possessions, these luxuries of modern civilisation, did not in themselves tend to elevate mankind, to make man's life purer or better, but merely to enable him to travel faster and to live with greater bodily ease. Our civilisation was but a varnish; our masses, aye, and most of our classes—were but savages at heart. It was said, "Scratch the Russian and you will find the Tartar;" he believed they might with equal truth say, "Scratch the Englishman and you will find the savage." They tried the

wrong thing when they thought to cure the evil by book-teaching and school boards. A little knowledge was a dangerous thing, and they were distributing this amongst a populace discontented with their condition and envious of their neighbours. They did not try to make their lives better by giving them art, and by teaching them how much that was good and lovely this world contained. Museums, galleries, and art collections of all sorts were very good in their way, but they did not reach the masses of the people. They needed for their refinement and education out-of-door art. They wanted sculpture in all their public places, parks, and gardens; not only monumental work but ideal work—fountains and statues. It was nonsense to say that the climate forbade it, or that the people would not appreciate it. They would appreciate sculpture if they had the chance, and then there would be less brutality and crime about. The lower classes loved beautiful buildings and statues, but they rarely got a chance of seeing them. The museums, galleries, and the like did not reach the labouring classes. It was in vain to open them freely, unless they opened them on Sundays. How could a man who had worked hard all day go to see works of art in the evening? They must place beautiful objects in the people's way. He believed that money spent in flowers and plants for our public parks was laid out at as good if not at better interest than that spent on school boards. Although he had no objection to the latter, he did not see why, if they went in for compulsory education, they should not make freehand drawing part of it. By doing this they would diminish the number of professional artists, since then every boy who could draw would no longer be considered a heaven-born genius, and thrust by his admiring friends into a profession for which he was never by nature intended. If they taught children to read books, why, with equal justice, should they not teach them to read works of art, and to express themselves in lines as well as in letters?

Mr. James M. Hay took exception to Mr. Simonds' remark—not with regard to the opening of art galleries and museums on Sundays, because that was a fair subject for debate—but a remark which was a disfigurement of a very excellent paper, namely, "that art was a greater civiliser even than religion itself." Were it the time or place he should have no hesitation in discussing that point with Mr. Simonds; but there were hundreds in this city far abler than he (Mr. Hay) was to take up that question. He considered it a most serious remark to make.

The Rev. Canon Warr deplored the appearance even of conflict between science, art, and religion. He looked upon all these gifts as coming from one source, and it was most dangerous to put one among the other. He should have been better pleased with the reader of the paper had he omitted the expression referred to, for he doubted very much whether there were many in that room who would accept it.

Mr. Simonds, in reply, said he should be grieved if any words of his should be construed into an attack upon religion. It was not his intention to imply that there was not future salvation, or that the immortality of the soul could be better insured by art than by religion. These were questions which every man must settle for himself. All he said was that the influence of art on civilisation had been greater than that of religion. Art was founded before religion was ever heard of, because savage man and the most degraded nations had no religion, but they had begun by art. He did not wish to hurt the susceptibilities of anybody, and he apologised sincerely, but he should be hypocritical if he retreated from the position which he had claimed for art and its civilising power.

#### Modern Renaissance in Sculpture.

Mr. Onslow Ford, A.R.A., read a paper on this subject. He referred to the fact that sculpture in this country was regaining its proper position amongst us, and was, happily, no longer a dead art in England. This being so, the question was, how this Renaissance was to be turned to the best advantage by the nation, by municipal bodies, and by artists themselves. An infinite amount of work remained to be accomplished, and untiring efforts should be made to impress the importance of sculpture upon the people and those who represented them. He spoke in ironical terms of the proceedings of municipal bodies when about to erect a statue or a monument to departed worth, and he thought that when money was bequeathed for the purpose of erecting a public statue, it would be the best course to pursue to empower his executors to look after the matter, to select a good artist, leave him unfettered, and thus escape the tender mercies of a committee. Very often when a body of men formed themselves into a committee for the erection of a monument, they appeared, oddly enough, to fancy that the very fact of their position converted them at once into judges of art, and, imbued with this astounding idea, they harassed the poor artists in all sorts of ways. If the artist hinted that he could get on much better if left to his own unfettered discretion, he was met with the answer that the committee were responsible to the subscribers. This might be so, but a committee was responsible not only to the subscribers,



but to the country; and when the artist was selected the responsibility shifted from them, and rested solely on the shoulders of the artist. Many a good work had been spoiled by the meddling and muddling interference of committees. He would suggest that one member of a committee instead of twelve or more should be left to deal with an artist when he had been selected. He recommended limited competition, rather in preference to open competition, and in conclusion spoke of what was required to make a good sculptor.

Mr. John Brett, A.R.A., said he regarded sculpture properly as a branch of architecture, and that architecture ought to have sculpture in mind. That was characteristic of the first Greek period. Until they could persuade architects to take the sculpture indoors in this climate they would have a very poor time of it, for they must live out in the cold. When the architect employed the sculptor as his chief workman they would get on in the cultivation of sculpture. They were meeting in Liverpool, which was the Venice of modern Europe. Let them consider what this "Venice" would leave to its descendants in the way of sculpture. In the small concert-hall of St. George's Hall they noticed certain virgins placed to sustain the balcony. The principal indoor feature of that room was sculpture. There were two virgins, and they were so choice and beautiful that it was thought worth while to repeat them at least twenty times. That showed the fertility of sculpture in these days. The architect, whoever he was, had the good sense to think that sculpture should form an important element in his conception, and he found his only resource with these two unfortunate virgins.

Mr. Simonds said that competition was a sore subject with all sculptors. They would not exaggerate if they said that they could defy committees to point to the existence in modern times of a successful competition, simply because the object of the discussion had been to get a lot of work done without payment for it. No man of reputation in these days would compete, because competitions had been so disgracefully managed that it was not worth his while to do so.

The Rev. Canon Warr said that until they could educate the masses art would have very little influence upon them. A great deal was being done to elevate the labouring classes to that point when they would be able really to understand and consequently to appreciate the great works of art that adorned that gallery and other public buildings.

### THE MUSEUM SECTION OF THE ART CONGRESS.

MR. E. RIMBAULT DIBDIN read a paper entitled "A Contribution towards the Art History of Liverpool," in which he said that the art history of Liverpool did not reach back into the far-distant past, and included no record of anything supremely memorable or epoch-making; yet it was much more interesting and important than was generally imagined, and when it came to be adequately chronicled would be found to vie with that of any other provincial town in this country.

Mr. Charles Dyall, curator of the Walker Art Gallery, read a paper on "Do Picture Exhibitions Promote or Impede the Progress of Art?" He said it might seem strange that in this age of picture exhibitions it should be thought necessary to discuss the question, but Mr. Frederic Harrison, in the *Nineteenth Century*, had asserted that all that had been done by exhibitions was a huge mistake, and that instead of promoting true art they were hampering and impeding its progress. Whatever might be said by adverse critics of its constitution and management, it was certain that the Royal Academy had recognised, fostered, and brought into prominence the English school of painters at a time when our nation was aroused as it had never been before to the far-reaching, elevating, and refining influence of pictorial art. Its annual exhibitions had aroused emulation and rivalry among artists, and made a knowledge of art a social necessity; to be ignorant of its operations was to be out of touch with the world of intellect. It had so enormously increased the desire for possessing pictures that its methods had been followed and imitated in every direction, both in the metropolis and the principal provincial towns. Never was there a time when art was so prominent in the everyday life of the people. Replying to the criticism of Mr. Harrison, who would reduce the painter's themes to a limited number, Mr. Dyall said that if we were to discontinue our large exhibitions, and hang only a small number of works selected as being noble, traditional, and beautiful, who was to select them, and who would select the selectors? Were the pictures to be painted in accordance with academic rules, or were they to be broad or pre-Raphaelite, realistic or impressionist? Public exhibitions, if they were to succeed, must be organised in a catholic spirit; the management must be capable of seeing and recognising whatever was good in every kind of art.

Mr. W. M. Conway read a paper on "Reproductions of

Ancient Works of Art for Municipal Museums." Having enumerated the materials which were at hand by which institutions desirous to make a representative collection of reproductions of the art of the past could do so, such as plaster casts, photographs, heliogravure, electrotype, &c., Mr. Conway said he should like to see, side by side with a collection of casts, photographs of the pictures and drawings of all the great masters, accurately grouped and arranged. He would also like to see photographs of all the great buildings in the world arranged according to style and period, reproductions of the goldsmith's art and of gems, from those of Babylon to the latest results of the gem engraver's art, and reproductions of the marvellous medals made in all periods of the world's history.

### APPLIED ART AT THE ART CONGRESS.

MR. G. H. GARRAWAY read a paper on "The Liverpool Art-Workers' Guild." He said his object was to champion those vital truths which he knew to be necessary. Rents were gradually lowering, and new houses were now built as cheaply as possible, without any expense of original artistic decoration; for, although there were architects of taste and capacity, they rarely turned their attention to building houses for any but large financiers. The usual mode of building houses was the merest application of ascertained cheap-builder methods, requiring much knowledge of the tricks of the trade, and also how much discomfort and inconvenience the public will put up with and yet pay rent for. He considered it monstrous that so many gentlemen and ladies should be content to live in such ugly houses. The miseries that an artist had to put up with were a huge, careless, indifferent public; a violent and most unscrupulous competition for the favour of a few wealthy persons; cliques of critics, theorists, and literary-minded persons with a mania for archæology. This would be seen in full force at picture exhibitions—a collection of pictures as at a fair, and the public went there as to a circus or a pantomime. Those exhibitions were gradually ruining the arts; they were tending to produce a type of artist half-tradesman, half-charlatan, a thousand times more dangerous to the arts than the uneducated crowd itself. These were the facts, and if a favourable turn were not taken the arts of the country would be ruined. There was a constant flux and reflux of works by Englishmen and foreigners from London through the provinces, this being upheld by the prejudice that everything from London must be good, and that there was no talent in the provinces; that artists were like horses running for cups and plates, and those should be patronised who were most popular. To remedy that state of affairs young people should be taught to recognise that on entering on a life of art they were open to many rebuts. Let them live as economically as possible, and so fit themselves for the struggle. The Guild desired that patrons of arts should take a little counsel with them as to what was best to be done. The Guild had also desired him to say they did not think there was sufficient municipal encouragement of the fine arts in their city. He would console himself in the immense sadness which these thoughts brought with them if he had inspired some Englishmen with the desire to help the Liverpool Art-Workers' Guild to apply remedies proportioned to so great evils.

### A School for Artistic Handicrafts.

Mr. H. B. Bare then read a paper upon "A School for the Artistic Handicrafts." He referred to the lamentable want of any systematic cultivation of the decorative arts, and said that the chief object in view to remedy this state of things should be to obtain for our craftsmen the highest cultivation in the decorative manual arts, as distinguished from those manufactures in which machinery performed the principal part, to train the designer and the worker to the fullest extent, and, through the improvement in their productions, eventually to elevate the public taste. The problem was how to bring the decorative arts out of their present disorganised and feeble condition into conformity with the parent art of architecture. It seemed to be essential that their efforts should be in the direction of re-establishing unity between the arts, and this could best be done by the adoption of some form of instruction which should combine the studio, the lecture hall, and the workshop with a study of literature and of contemporary science. Notwithstanding the provision at the Liverpool College of the Victoria University of a considerable portion of the educational machinery needed for this system of training, and notwithstanding the remarkable progress made at that institution, yet it must be incomplete until it had provided for the higher and specialised education in the arts as liberally as for the branches of literature and science. Its Roscoe chair of art met the general requirements of a liberal education, but it was not intended to provide exhaustive training in special branches. What was needed was the endowment of a chair of architecture and the allied arts. With such an endowment there would be little doubt of the practicability of including a school for the crafts which were in



natural alliance with architecture. Mr. Bare then proceeded to describe the course through which he had suggested the student of architecture and the craftsman should be led. He afterwards said that it was much to be regretted that the original intention of holding an exhibition of decorative art work in that building—the Walker Art Gallery—during the congress had not been adhered to, and he hoped that the Corporation would afford every opportunity for periodic displays of local art upon the lines laid down for the recent Arts and Crafts Exhibition in London, where the main fact to be observed was the introduction of the names of the artist and worker, which were—and very properly so—attached to the exhibit. He contended it was as legitimate a demand on the part of the producer of a good piece of furniture, wood-carving, metalwork, pottery, mosaic, &c., that his name should be upon it as that the artist should sign the work hung on the walls of our picture galleries. In conclusion Mr. Bare said that the necessity could not be too frequently urged for the establishment in the larger provincial cities of the kingdom of museums of industrial art, which were in every way as important as the collection of pictures in public galleries for elevating the public taste. If the principle of a really national scheme of education in the arts and crafts was admitted, it must be allowed that it was insufficient to centralise our collections of specimens at South Kensington, magnificent and complete though that exhibition might be. It was a decentralising system that appeared to be most required. He sincerely hoped that some strong united effort would be made to improve effectively the position of the arts and crafts in Liverpool. That would be a worthy outcome of the congress, if nothing more were done.

The following resolution was adopted:—"That in the opinion of this congress, it is desirable that largely increased facilities should be afforded for the distribution of photographs, or copies by other processes of art motives and examples for the use of local museums, and all schools and art classes throughout the kingdom at low prices; these examples to include the best works of industrial art in our local museums; also and especially, from continental and Oriental sources; and that the President of the congress be requested to convey this resolution to the Vice-President of the Council of Education, with a view to this suggestion being carried into effect by the Department of Science and Art."

#### EDINBURGH ARCHITECTURAL ASSOCIATION.

AT last week's meeting of the Edinburgh Association, Mr. David Macgibbon, architect, read a paper entitled "The Castles of the Western Highlands and Islands of Scotland." After a short account of the periods into which Scottish civil architecture might be divided, attention was drawn to the large number of castles of the first period (or 13th century) still preserved in this region, and the value of these in connection with the early history of Scottish architecture, comparatively few specimens of that age being left in the more populous parts of the country. The origin of these castles was then considered, and the light thrown upon them by the general history of the Highlands and Islands, and the conclusion drawn was that they were erected by the Royal authority, and held by a custodian appointed by the Crown. The internal evidence of the buildings pointed to their belonging to the 13th century, when the islands became part of Scotland, and when the use of stone and mortar was introduced in castle building. Plans and views of Mingary, Duart, Castle Tirim, Castle Swin, Skipness, Urquhart, and a number of other castles of the 13th century, were exhibited and explained. Numerous other examples corresponding with the various styles on the mainland were illustrated and explained, showing that the Scottish style was universal over the whole country, including the isles, for a period of 500 years. It was also limited to Scotland, and was eminently a national style, and as such well worthy of preservation and imitation. At the close a vote of thanks was accorded to the lecturer.

#### GENERAL.

**The Empress Frederick** has purchased several panels which were produced in the Windsor Works, one being the marriage scene from "Much Ado about Nothing," designed by Mr. H. A. Bone.

**Mr. G. A. Storey's** picture, *The Violinist*, has been presented to the Corporation Art Gallery by the Goldsmiths' Company.

**Mr. Charles Bird** has completed two etchings of the Lauders and Blackader's crypts in Glasgow Cathedral.

**A New Institute**, comprising reading-room, lecture-room, recreation-room, &c., has been opened at Winhill, having been built at a cost of about 1,500*l.*, by Messrs. Lowe & Sons, from plans prepared by Messrs. Osborn & Reading, of Birmingham.

**A Memorial** to the late Archdeacon of Stafford, to take the form of an alabaster recumbent effigy, is to be placed in Lichfield Cathedral. The vicar of St. Mary's, Lichfield, brother to the late Sir G. G. Scott, R.A., has been appointed his successor.

**Sir E. Watkin** has given 100 guineas towards the cost of painted glass for the large east window of Hythe parish church, in Kent, which will be designed by Mr. Pearson, R.A.

**A Stained-glass Window** is being placed at the east end of St. Mary's Church, Crumpsall, in memory of the late Bishop Fraser.

**The Committee** appointed to arrange for a suitable memorial to the late Hon. F. J. Tollemache, at Grantham, have decided to invite designs and tenders for a bronze statue from 7 feet to 9 feet high. The statue is to be fixed upon a pedestal or fountain 17 feet in height.

**Sir Edward Green** has given 500*l.* to the Wakefield Industrial and Fine Art Institution, a cheque for which Lady Green presented to the president, Mr. Bruce, after distributing the prizes to the successful students of the Art School on Tuesday evening.

**The Parish Church**, Stony Stanton, has been reopened after renovation and the building of a new north aisle, under the direction of Mr. W. B. Smith, architect, London.

**A Scheme of Decoration**, after the designs of Mr. A. E. Lloyd Oswell, architect, has been carried out in Middleton-in-Chirbury parish church, by Messrs. Williams & Son, of Shrewsbury.

**A Mission Church** is proposed to be built at Rochester as a memorial of the late Canon Conway, who, when vicar of St. Nicholas, Rochester, built and endowed the church of Holy Trinity at a cost of 13,000*l.*

**A Reredos** has been placed in Christ Church, Willaston. The panels are filled with evangelistic and other symbols. It was designed by Mr. David Walker, architect.

**Ratby Parish Church** has been refloored and resealed, dry rot having made its appearance in the flooring and benches after the restoration of the church a few years ago, and which was said to be caused by the want of underground ventilation.

**The Oxford University Authorities** have renewed, for a further term of three years, the grant of 100*l.* a year which was made towards the maintenance of the British School of Archaeology at Athens. Besides this a sum of 160*l.* is to be spent on providing extra fittings for the Ashmolean Museum, and 200*l.* more on repairing the conservatories in the Botanical Gardens.

**The Tower of Bridgerule Church**, Devon, was struck by lightning last week, and fissured from the top nearly to the ground. An iron rod, running from the flag-pole to the corner pinnacle, is supposed to have attracted the lightning.

**The late Mr. George Nelson**, sculptor, London—who was an assistant of Musgrave Watson—has bequeathed to the Carlisle School of Art a collection of his own works, for the furtherance of art in his native city. The valuation for probate purposes is 41*l.* 13*s.*

**A Constitutional Club** erected in Scarborough, from the plans of Mr. H. A. Cheers, of Twickenham,—selected in competition—has been completed. The building is in Queen Anne style, of red brick and Whitby stone.

**The Restoration** of Shobrooke Church, Devon, which was initiated nine years ago, has been completed under the direction of Mr. Ashworth, of Exeter.

**The Foundation-stone** of a new church at Starbeck, of which Mr. Sheard, of Harrogate, is the honorary architect, was laid on Friday last.

**A Permanent Building** for the Free Church at Springburn, N.B., is to be proceeded with at once, in place of the iron church at present used.

**New Racing Stables** have been erected at Newmarket for Mr. Blundell Maple, and special attention has been paid to the ventilation. Messrs. Robert Boyle & Sons' latest-improved patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

**Mr. W. G. Penty**, architect, last week gave a lecture in the York Institute on the archaeology and art of ancient Egypt. The student, he said, experienced the greatest difficulty in comprehending a civilisation whose antiquity was so far removed from Greece and Rome that in comparison the latter appeared grouped with modern nations. Egypt was the birthplace of art, and its works formed the foundation for subsequent artistic development.

**The Duke of Devonshire** has notified his intention of handing over to the Buxton Local Board the Serpentine Walks, a favourite public resort in the town, conditionally upon their being kept in repair by the town's authority. The Duke has also given sufficient land to form a handsome approach to the new town-hall, free library, and public offices. The value of the gift amounts to about 4,000*l.*



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, DECEMBER 7, 1888.

## COMPETITIONS OPEN.

SOUTHAMPTON.—Feb. 1.—Designs are invited by the Executors of the late Mrs. H. Bellenden Sayer for the Erection of a Drinking Fountain. Messrs. Sharp, Harrison, Turner & Turner, Solicitors, Southampton.

YORK.—Feb. 16.—Designs, &c., are invited for the Erection of Courts of Justice and Police and Fire Brigade Stations. Premiums of £100, £50, and £25. Mr. George McGuire, Town Clerk, Blake Street, York.

## CONTRACTS OPEN.

BALTINGLASS.—Dec. 15.—For Building 10 Labourers' Cottages. Mr. J. R. Dagg, Clerk to the Guardians, Baltinglass.

BLAINA.—Dec. 24.—For Building Wall near Pontygwellwhch Bridge. Mr. G. Stevens, Surveyor, Blaina.

BRADFORD.—Dec. 13.—For Building Shops and Business Premises. Messrs. Fairbank & Wall, Architects, Craven Bank Chambers, Bradford.

BRADFORD.—Dec. 17.—For Erection of Farm Buildings near Scholemoor Cemetery. Mr. J. H. Cox, Borough Surveyor, Town Hall, Bradford.

BRADFORD.—Dec. 15.—For Building Sawing Shed, Engine Bed, Warehouse, and Stabling. Mr. S. Robinson, Architect, 5 Exchange Buildings, Bradford.

BRIGHTON.—Dec. 31.—For Erection of Two Blocks of Infirmary Buildings and Enlargement of Infants' Ward at the Workhouse. Mr. B. H. Nunn, Architect, 129 Queen's Road, Brighton.

CARLISLE.—Dec. 14.—For Pulling-down and Rebuilding Premises, Scotch Street. Mr. George Dale Oliver, Architect, Bank Chambers, Carlisle.

CHARLTON.—For Building Wesleyan Chapel. Mr. H. H. Church, Architect, William Street, Woolwich.

CHEVINGTON.—Dec. 15.—For Additions, &c., to Board School, Red Row. Mr. William Webb, 23 Newgate Street, Morpeth.

CLOUGHFOLD.—Dec. 13.—For Building Church. Mr. W. Wright, Surveyor, Lancaster.

DARTMOUTH.—Dec. 18.—For Construction of Pontoon and Approach Bridge, Waiting Rooms, Booking Office, &c. Mr. J. D. Higgins, Secretary, Paddington Station.

EARLSHEATON.—Dec. 10.—For Building Power Loom Sheds, Engine and Boiler-houses, and Long Chimney. Mr. F. W. Ridgway, Architect, Church Street, Dewsbury.

GREAT WESTERN RAILWAY.—Dec. 18.—For Construction of Passenger Station and Goods Shed at Culkerton. The Secretary, Paddington Station.

GUISELEY.—Dec. 8.—For Building Three Houses and Shop, with Outbuildings. Mr. H. H. Chippindale, Architect, Guiseley.

GAWBER.—Dec. 10.—For Reseating, &c., Church. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

HALIFAX.—Dec. 14.—For Extension of Foundry and Pattern Room. Mr. J. Farrer, Architect, 29 Northgate, Halifax.

HARROW.—Dec. 11.—For Pulling Down and Rebuilding Schools and Teacher's House. Mr. G. Cheffings, Clerk to the School Board, Harrow-on-the-Hill.

HARROW.—Dec. 18.—For Building Mortuary, Stabling, Cottage, &c., Roxborough Corner. Mr. C. F. Hayward, Architect, 47 Museum Street, Bloomsbury.

ILKLEY.—For Adding Billiard-room, Smoke-room, &c., to Wells House. Messrs. Kelly & Birchall, Architects, Imperial Buildings, Leeds.

KESWICK.—Dec. 15.—For Additions, &c., to St. John's Church. Mr. William Marshall, Architect, 28 Bedford Square, London, W.C.

LEEDS.—Dec. 17.—For Building Extension of Clothing Factory. Messrs. Smith & Tweedale, Architects, 12 South Parade, Leeds.

LEWISHAM.—Dec. 24.—For Works in connection with Colfe's Grammar School, for the Leathersellers' Company. Mr. E. Lyne Parsons, Architect, 236 High Street, Exeter.

MANCHESTER.—Dec. 17.—For Building Library and News-room, Moss Side. Mr. W. R. Acton, Surveyor to the Local Board, Moss Lane East, Moss Side, Manchester.

NANTWICH.—Dec. 7.—For Laying Cast-iron Water Mains, &c. Mr. J. A. Davenport, C.E., 152 Hospital Street, Nantwich.

NOTTINGHAM.—Dec. 10.—For Stripping Roofs of Free Library and Museum Departments of University College, Recovering Roofs, &c. Messrs. Verity & Hunt, Architects, Guildhall, Nottingham.

PONTELAND.—Dec. 8.—For Building Workhouse, comprising Main Block, Vagrant Wards, Board Offices, Boundary Walls, &c. Mr. W. Lister Newcombe, Architect, 89 Pilgrim Street, Newcastle-on-Tyne.

SLOUGH.—Dec. 13.—For Building the Leopold Institute. Mr. H. A. Cheers, Architect, Twickenham.

SOUTH STONEHAM.—Dec. 10.—For Rebuilding Bishopstoke Canal Bridge. Mr. W. Langrish, Surveyor, Bitterne.

THORNTON.—Dec. 13.—For Building Methodist Sunday-schools, Classrooms, and Caretaker's House. Mr. A. Sutcliffe, George Street, Thornton.

TRIM.—Dec. 17.—For Conversion of Gaol into School for Pauper Children. Mr. A. Scott, Architect, Navan.

WOOLWICH.—Dec. 20.—For Building Wing on the East of Infirmary at Plumstead. Mr. J. O. Cook, Architect, 1A Eleanor Road, Woolwich.

## TENDERS.

### AUDENSHAW.

For Erection of a Vicarage for the Parish of St. Stephen's, Audenshaw. Mr. J. H. BURTON, Architect, Warrington Street, Ashton-under-Lyne.

T. W. Bates, Droylsden	£2,390	0	0
W. Neal, Ashton-under-Lyne	2,320	0	0
J. Lowe, Hooley Hill	2,297	11	4
J. Davison, Manchester	2,281	10	0
W. Hurst, Audenshaw	2,280	2	6
T. Rome, Manchester	2,267	0	0
Butters & Carson, Manchester	2,249	0	0
R. Hilton & Sons, Oldham	2,199	19	0
W. Holt, Manchester	2,196	0	0
C. Wallworth, Gorton	2,175	0	0
R. Whitell, Manchester	2,142	0	0
A. Holmes, Ashton-under-Lyne	2,131	0	0
T. Dean, Ashton-under-Lyne	2,130	2	0
J. Gibson, Dukinfield	2,125	0	0
Fitton & Bowness, Ashton-under-Lyne	2,097	0	0
T. Storer, Denton	2,065	0	0
J. Robinson, Ashton-under-Lyne	2,052	0	0
W. Underwood & Bros., Dukinfield	2,047	12	9
J. Clayton, Denton	2,021	12	0
C. Morris, Ashton-under-Lyne	2,019	11	6
J. W. Williamson, Ashton-under-Lyne	1,995	0	0
GARSDALE, BARNES & CO., Stalybridge (accepted)	1,995	0	0



**ARMLEY.**

For Eight Houses, Armley, Leeds, for Mr. W. Sumley. Mr.			
W. RHODES, Architect, Upper Wortley.			
W. Oddy, New Wortley, bricklayer and mason	£610	0	0
Stead Bros., Upper Wortley, joiner	330	0	0
J. Wilson, New Wortley, plumber	120	10	0
W. J. Haddock, Armley, plasterer	75	0	0
J. Atkinson & Son, Leeds, slater.	48	17	0

**CLOWN.**

For Building Clown Boys' School, &c. Messrs. S. ROLLINSON & SON, Architects, 13 Corporation Street, Chesterfield.

*Works at Old Schools.*

Hadfield & Frost, Nottingham.	£145	0	0
Joseph Harrison, Sheffield	142	0	0
Joseph Collingham, Langwith, near Mansfield	140	0	0
John Jackson, Whitwell	138	15	0
John Drabble, Mosbrough	128	10	0
Isaac Margerison, Chesterfield.	128	0	0
George Haynes, Bolsover.	120	0	0
Amy Wright, Chesterfield	119	0	0
George Stevenson, Eckington	117	0	0
John Roe & Son, Alfreton	103	15	0
Adam Eastwood, Warsop, near Mansfield	95	15	6

*Boys' School.*

George Stevenson, Eckington	£1,982	0	0
John Jackson, Whitwell	1,961	14	0
John Drabble, Mosbrough	1,862	13	0
Isaac Margerison, Chesterfield	1,853	0	0
John Roe & Son, Alfreton	1,798	0	0
George Haynes, Bolsover	1,793	0	0
Amy Wright, Chesterfield	1,792	16	7
Joseph Harrison, Sheffield (amended)	1,766	0	0
Hadfield & Frost, Nottingham	1,710	0	0
Joseph Collingham, Langwith, near Mansfield	1,700	0	0
Adam Eastwood, Warsop, near Mansfield	1,603	2	4
Joseph Harrison, Sheffield	1,366	0	0

(Joseph Collingham's tender is accepted.)

**BRIDLINGTON QUAY.**

For Building Retaining Wall, North side Harbour, for the Commissioners. Mr. J. EARNSHAW, Architect, Wellington Road, Bridlington Quay.

C. Owston	£650	0	0
J. Rennard	624	10	0
F. J. Leeson	495	0	0
L. MAINPRIZE (accepted)	390	0	0

**BRIDLINGTON QUAY—continued.**

For Building Semi-detached Villas on the Victoria Road Estate, for Mrs. Scott and Miss R. A. Foster, Mr.			
J. EARNSHAW, M.S.A., Architect, Wellington Road, Bridlington Quay.			
C. Owton	£1,440	0	0
R. Bailey	1,350	0	0
J. Rennard	1,125	0	0
L. MAINPRIZE (accepted)	1,110	0	0

**DARENTH.**

For Supply of Furniture for Pavilions and New Blocks at Darenth, Kent, for the Metropolitan Asylums Board.

*Pavilion.*

J. Lawes & Co.	£832	8	4
C. & R. Light	772	5	8
Bartholomew & Fletcher	734	5	6
Hampton & Son	708	9	4
Atkinson & Co.	681	2	10
F. GILES & Co. (accepted)	636	2	0
T. Harden, Stokenchurch (informal)	—	—	—

*New Block.*

J. Lawes & Co.	328	1	2
C. & R. Light	309	1	11
Bartholomew & Fletcher	300	0	0
Hampton & Son	282	9	6
Atkinson & Co.	277	19	10
F. GILES & Co. (accepted)	272	3	10
T. Harding, Stokenchurch (informal)	—	—	—

**DOVER.**

For the Construction of a Store and Shed at Stembrook, for the Dover Town Council.

Johnson & Co., Dover	£245	0	0
H. Stiff, Phoenix Works	250	0	0
H. Richardson, Dover	340	0	0
J. Hodges, Dover	275	0	0
W. Bromley, Dover	233	0	0
G. LEWIS & SONS, Dover (accepted)	220	0	0

**LIVERPOOL.**

For Building Library, Kensington, Liverpool.

Edmund Gabbutt	£2,944	0	0
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No. 1.—Longitudinal Section.



No. 2.—Longitudinal Section.

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Experiments show a resistance to load and impact greater than furnished by the ordinary concrete floors. No thrust is transmitted to the walls, as in all arched construction, the walls being tied in and strengthened.

The floors are practically noiseless, the different densities of the concrete, brick and plaster, with the air space above, intercepting the sound vibrations.

The depth of the finished floor is 6 to 9 inches only, and when the saving on this head is taken into account, the cost does not exceed that of the ordinary combustible timber floor of corresponding strength.

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## ELLENBOROUGH (CUMBERLAND).

For Alterations, &c., to Property at Ellenborough. Mr. J. S. MOFFATT, M.S.A., Architect, 53 Church Street, Whitehaven.

H. Killip, Harrington . . . . .	£182	15	0
Smith & Marshall, Maryport . . . . .	180	12	3
J. W. Fitzsimmons, Ellenborough . . . . .	164	2	3
T. MANDLE, Maryport (accepted) . . . . .	155	5	0

## HASTINGS.

For Building at the Schools, Sandown Place, Ore, Hastings. Mr. F. H. HUMPHREYS, Architect, 6 Trinity Street, Hastings.

Taylor Bros. . . . .	£1,535	0	0
C. Tanner . . . . .	1,380	0	0
Moon & Garner . . . . .	1,365	0	3
W. Small . . . . .	1,347	18	7
D. H. Snow . . . . .	1,335	0	0
P. Jenkins . . . . .	1,312	0	0
F. J. Cruttenden . . . . .	1,298	0	0
F. Thorpe . . . . .	1,295	0	0
T. PATTENDEN (accepted) . . . . .	1,176	0	0

## HORSHAM.

For Erection of House and Offices at Market Square and South Street, Horsham, for Colonel James Clifton Brown. Messrs. E. & C. H. BURSTOW, Architects and Surveyors, of Horsham & Horley.

Joseph Potter, Horsham . . . . .	£1,222	0	0
P. Peters, Horsham . . . . .	1,130	0	0
Pannett Bros., Horsham . . . . .	1,098	0	0
H. Potter, Horsham . . . . .	1,075	0	0
George Sharp, Horsham . . . . .	999	0	0
ROWLAND BROS., Horsham (accepted) . . . . .	990	0	0

## LONDON.

For Supplying and Fixing Three Urinals (Slate and Iron), for the Strand District Board of Works. Mr. W. VENTRIS, Engineer.

Doulton . . . . .	£619	8	3
Jennings . . . . .	490	0	0
Finch . . . . .	367	0	0

For Taking up Floors and Laying New Floors in Boys' Two Day-rooms, Hanwell School, for the Managers of the Central London School District. Messrs. H. JARVIS & SON, Architects, 29 Trinity Square, S.E.

WOOD BLOCK FLOORING CO. (accepted) . . . . .	£245	0	0
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## LONDON.

For Removing Iron Buildings from Shillington Street to Queen Street, Walworth, for the London School Board.

Croggon & Co. (Limited) . . . . .	£148	15	0
North & Son . . . . .	115	0	0
T. Cruwys . . . . .	110	0	0
J. W. Roy . . . . .	106	16	0
G. B. Ash . . . . .	86	0	0

For Works to Board Schools.

## Central Street, Finsbury.

G. Parker . . . . .	£330	0	0
Stevens Bros. . . . .	302	0	0
Norris & Luke . . . . .	294	0	0
W. Neil . . . . .	278	10	0

## Harwood Road, Chelsea.

W. Burgess . . . . .	383	0	0
T. Linfield . . . . .	253	0	0
T. Bendon . . . . .	252	10	0
Simmonds Bros. . . . .	243	0	0

## Princeton Street, Finsbury.

W. Hornett . . . . .	39	15	0
E. H. Sarjeant . . . . .	39	10	0
Davis Bros. . . . .	38	10	0

## Plumstead Road, Greenwich.

G. Pitchford . . . . .	57	0	0
Albion Iron and Wirework Co., Limited . . . . .	37	5	0
J. J. Thomas & Co. . . . .	32	14	8

## Hammond Square, Hackney.

Grover & Son . . . . .	20	10	0
O. Dawson . . . . .	20	0	0
C. Dearing & Son . . . . .	19	15	0
F. & F. J. Wood . . . . .	19	10	0
C. V. Howard . . . . .	16	8	0

## Springfield, Lambeth.

B. E. Nightingale . . . . .	52	0	0
H. Mallett . . . . .	48	0	0
R. A. Marshall . . . . .	46	0	0
W. Pearce . . . . .	42	10	0
Lathey Bros. . . . .	39	10	0

## Essex Street, Tower Hamlets.

C. V. Howard . . . . .	13	9	0
F. & F. J. Wood . . . . .	11	0	0
J. J. Thomas & Co. . . . .	8	13	8
Albion Iron and Wirework Co., Limited . . . . .	7	17	0

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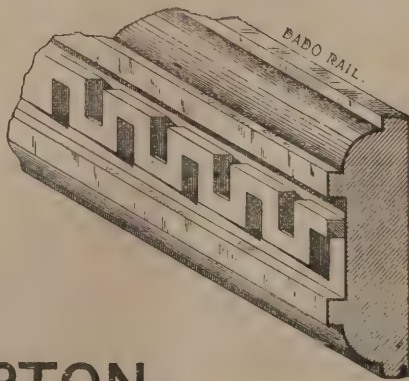
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## LONDON—continued.

For Alterations to Lavatory, &c., at Board Offices, Old Charlton, Kent, for the Plumstead Board of Works.

Soper, St. John's . . . . .	£145	0	0
Proctor, Woolwich . . . . .	133	0	0
Bridel, Greenwich . . . . .	125	0	0
Williams, Charlton . . . . .	115	0	0
Stephens, Charlton . . . . .	110	0	0
Heryet, Blackheath . . . . .	109	0	0
Grant, Charlton . . . . .	108	0	0
Clarke, Plumstead . . . . .	98	5	0
Forman, Plumstead* . . . . .	95	0	0

\* Recommended for acceptance.

For Supplying and Laying 4,885 superficial yards of Wood Pavement between Lillie Bridge and North End Road, Fulham. Mr. J. P. NORRINGTON, Surveyor, Vestry Hall, Walham Green.

Nowell & Robson . . . . .	£2,375	0	0	£2,500	0	0
Turner & Son . . . . .	2,164	0	0	2,245	0	0
Mayo . . . . .	2,125	0	0	2,185	0	0
Biggs . . . . .	2,096	0	0	2,218	0	0
Improved Wood Paving Co. . . . .	2,000	0	0	2,040	0	0

## NORTHAMPTON.

For Extension to Town Hall, Northampton.

	Without glazed bricks for cells.	Additions for glazed bricks.
G. Branson & Son, Northampton . . . . .	£28,147	£1,187 10 0
J. Williams, London . . . . .	25,200	1,250 0 0
T. Cosford, Northampton . . . . .	23,800	583 0 0
Bradney & Co., Wolverhampton . . . . .	23,550	1,175 0 0
Reynolds & Son, Northampton . . . . .	23,460	903 0 0
J. Parnell & Son, Rugby . . . . .	23,333	1,177 0 0
R. Finnigan, Northampton . . . . .	23,300	1,450 0 0
Foster & Dicksee, Rugby . . . . .	22,656	1,188 0 0
G. Henson, Wellingborough . . . . .	22,400	720 0 0
E. Archer, Northampton . . . . .	22,392	975 0 0
Claridge & Bloxham, Banbury . . . . .	21,973	785 0 0
Green Bros., Northampton . . . . .	21,945	950 0 0
E. Gabbutt, Liverpool . . . . .	21,800	1,200 0 0
D. Ellwood & Son, Sandy . . . . .	21,650	540 0 0
J. T. Wingrove, Northampton . . . . .	20,855	995 0 0
J. Shillitoe & Son, Bury St. Edmunds . . . . .	20,750	900 0 0
H. Willcock, Wolverhampton . . . . .	20,378	975 0 0

## MACROOM.

For Building Labourers' Cottages, for the Macroom Union.

P. Connell, Rylam . . . . .	£85	0	0
J. McDonnell, Carrigadrohed . . . . .	84	0	0

## PORTSMOUTH.

For Building Quarters for Aged Married Couples at the Workhouse, for the Guardians, Portsea Island Union.

H. Boulton, Portsmouth . . . . .	£2,256	0	0
J. Crockerell, Portsmouth . . . . .	2,088	0	0
D. W. Lewis, Portsmouth . . . . .	2,084	0	0
S. & A. Sprigings, Portsmouth . . . . .	2,075	0	0
W. Ward, Portsmouth . . . . .	2,050	0	0
G. Burbidge, Portsmouth . . . . .	1,997	0	0
F. White, Portsmouth . . . . .	1,975	0	0
H. Clarke & Son, Portsmouth . . . . .	1,915	0	0
T. W. Quick, Portsmouth . . . . .	1,897	0	0
W. Learmouth, Portsmouth . . . . .	1,890	0	0
J. H. Corke, Portsmouth . . . . .	1,887	0	0
W. W. Evans, Portsmouth . . . . .	1,875	0	0
W. A. Carter, Portsmouth . . . . .	1,805	0	0
C. H. Roberts, Portsmouth . . . . .	1,750	0	0
T. P. HALL, Portsmouth (accepted) . . . . .	1,730	0	0
Wellstead, Portsmouth . . . . .	1,700	0	0
F. G. White & Sons, Portsmouth (tender withdrawn) . . . . .	1,580	0	0

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For Heating by Hot Water (Low-pressure System) the New Assembly Rooms, Surbiton.

J. JONES & SONS, 42 Farringdon Street, E.C. (accepted) . . . . .	£134	0	0
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## SOUTHPORT.

For Supply of 400 Hopper Closet Basins. Mr. W. CRABTREE, Borough Surveyor, Southport.

S. Gratrix, jun., Manchester . . . . .	£51	13	4
T. Gibson, Southport . . . . .	40	0	0
T. Simpson, Southport . . . . .	39	18	0
A. Halsall, Southport . . . . .	39	17	0
STIFF & SONS, Lambeth (accepted) . . . . .	39	10	0

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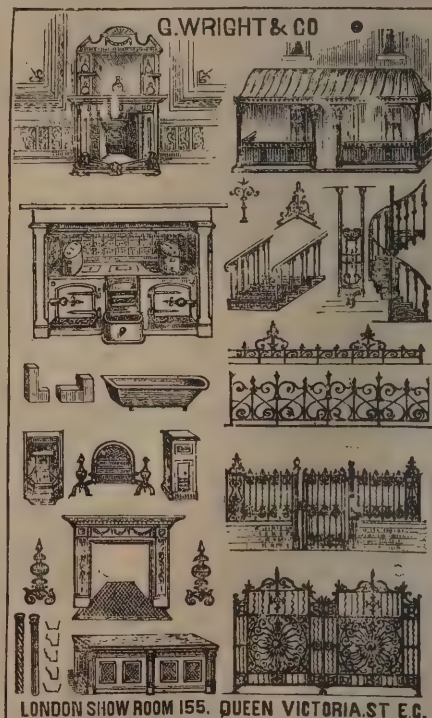
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J. Whitehead, Preston	73	3	6
Heyes & Lunt, Southport	70	0	0
B. & W. T. Pidduck, Southport	69	17	6
S. Rowland, Wigan	68	10	0
Cameron & Robirton, Kirkintilloch	68	0	0
J. SIMS, Bedford Leigh (accepted)	65	0	0

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J. Sims, Bedford Leigh	16	10	6
Heyes & Lunt, Southport	15	0	0
S. Rowland, Wigan	15	0	0
Cameron & Robertson Kirkintilloch	14	17	6
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W. Hamer & Son, Northwich	46	5	0
G. Smith & Co., Glasgow	45	0	0
J. & S. Roberts, West Bromwich	40	0	0
North Lonsdale Iron Co., Limited, Ulverston	40	0	0
G. Chatton, Little Lever	38	13	6
W. Halford, Warrington	37	10	0
T. E. Kershaw, Nuneaton	32	10	0
Woodroffe & Co., Rugeley	29	11	6
C. E. Firmstone & Bros., Stourbridge	29	11	6
T. J. S. Clapham, Wigan	28	15	0
Monk Bros., Preston	28	10	0
Carron Co., Carron	27	6	0
M. & W. Grazebrook, Dudley	26	10	0
The Exors. of Daniel Clark, Carlisle	25	0	0
D. Parsons & Sons, Pensnett	25	0	0
W. Summerscales & Sons, Keighley	20	10	0
J. E. Hainsworth & Co., Dewsbury	20	0	0
HINDSFORD FOUNDRY CO., Tyldesley (accepted)	19	10	0

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For Construction of a Graving Dock, Newport, Mon., for Messrs. Mordey, Carney &amp; Co., 350 feet long by 75 feet wide, and other Works. Messrs. JACOBS &amp; PICKTHALL, Engineers, Cardiff.

T. Gouldesworthy, Newport	£28,700	0	0
T. J. Ridley, Middlesbrough	27,780	0	0
J. Cockrane & Son, Westminster	27,396	0	0
E. Gibb, Skipton	26,500	0	0
Jenkins Bros., Swansea	24,761	0	0
Exors. of W. Gradwell, Barrow-in-Furness	23,300	0	0
T. W. Davies, Cardiff	21,227	0	0
W. R. Parker, Cardiff	20,000	0	0
S. Pearson & Son, Westminster	19,914	0	0
J. MACKAY, Hereford (accepted)	19,000	0	0

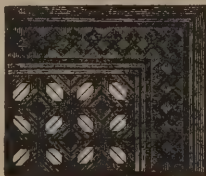
**TRADE NOTES.**THE tender of Messrs. Parker & Sharpe, to complete the new lock on the Foss for 3,482*l.*, has been accepted by the York City Council.

An award of 37,621*l.* has been given by the arbitrator, Mr. W. Beadel, M.P., in regard of the claim of Captain Park-Yates against the Manchester Ship Canal Company for his residential estate in Cheshire, near the mouth of the Mersey. The claim was for 73,490*l.*, and the evidence of professional gentlemen supported that amount. The witnesses for the Manchester Ship Canal Company considered 25,515*l.* was sufficient.

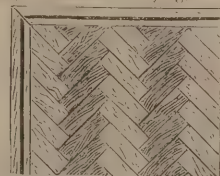
THE arbitration case, Kirk & Randall v. East and West India Dock Company, which was supposed to be interminable, has reached the stage of deposit of award by Sir Frederick Bramwell. The contractors claimed for extra works, and damages for suspending them in the execution of the works, and when the proceedings had reached a certain stage an effort was made by the defendants to restrict the arbitrator's right, to receive evidence. This involved action in several courts, and, finally, the proceedings were ordered to be continued as before. The arbitrator now decides in favour of the contractors. A sum of 195,000*l.* is awarded on account of works, besides an amount for damages which has yet to be



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assessed, the contractors' claim being 300,000*l.* for the wrongful suspension of works. The Dock Company will also have to pay costs. Messrs. Kirk & Randall were unjustly treated, and deserve all the compensation they are likely to receive. It will be a pity if enough money is not to be found to pay them.

INDIARUBBER is the latest device introduced for street-paving in Germany, and it is to be put down in one of the Berlin streets as an experiment. It is not, however, a novelty, having been used in this country for years on a small scale for deadening sound under archways, as at the St. Pancras Midland Hotel.

A PROPOSAL on the part of some leading gentlemen in Dumbarton to erect a cottage hospital for the burgh has taken practical form, a site having been purchased in the Townend district for the new institution. Plans have been prepared by Mr. Thomson, architect, George Street, Edinburgh, and offers are now being accepted for the work.

IN a competition for the best scheme for sewerage and sewage disposal for Otley, in Yorkshire, the premium has been equally divided between Mr. W. H. Radford, C.E., of Nottingham, and Messrs. Brierly & Holt, of Manchester. Mr. Radford was the successful competitor also at Newhaven, Beacontorpe, and Macclesfield.

AT the last meeting of the Douglas Town Commissioners, it was resolved to erect new abattoirs on a site known as the "Lake Yard," situated near the railway station. Plans submitted in open competition by Mr. Thomas W. Cubbon, architect, of Birkenhead and Douglas, were unanimously recommended by the committee and adopted by the Board. The scheme comprises eight private slaughter-houses, one public slaughter-house, with the necessary lairage accommodation attached, and large cooling-house or dead meat market; also accommodation for pig slaughtering and dressing. The estimated cost of the scheme, including site, amounts to about 7,000*l.*

THE furnacemen at Barrow decided on Tuesday to resume work, their wages to be based on a sliding scale, and operations have been resumed at the iron and steel works. Thirteen blast furnaces have been damped down owing to the strike, and 3,000 men have been idle.

THE Water and Sewerage Committee have presented a report to the Worcester Town Council, in which they state that if the present source of water supply is to be retained it appears necessary to carry out works at an estimated cost of 26,000*l.*

They prefer obtaining a substituted supply for Burcot, but, failing that, it would be desirable to sink a trial bore-hole at a site near Aston Fields.

MISS GRACE HAWTHORNE has arranged with Mr. Wilson Barrett to produce a new play at the Princess's on the termination of the run of "Hands across the Sea." The engagement with Mr. Barrett is limited to twelve weeks. Miss Grace Hawthorne will herself appear in weekly matinées during Mr. Barrett's engagement. There is no truth in the rumour that Miss Hawthorne proposes to part with the lease of the Princess's Theatre, which she has recently renewed for a further term of five years. The patrons of this theatre will be pleased to hear that Mr. W. W. Kelly will still retain the reins of management.

MESSRS. JONES & ATTWOOD, of Stourbridge, have just finished heating by their patent system—Wesleyan Chapel, Bradley, near Wolverhampton; Kingswinford Church, near Dudley; Annington Church, Tamworth; Coseley Church, Salop; Congregational Chapel, Lye, Stourbridge; Wesleyan Chapel, Brades, near Birmingham; Town Hall, Darlaston; Municipal Buildings, Bridgenorth; Basford Prison, Nottingham.

A DESIRE has been expressed for the fixing of a carillon-machine in the belfry of the parish church, Walsall, the cost of which will be about 250*l.* Towards this one well-known townsman has offered to contribute a substantial sum.

THE usual monthly meeting of the Leeds Association of Foremen Engineers and Draughtsmen was held on Thursday last week, when the President (Mr. J. C. Moorhouse) read an interesting paper on "A Comparison of English and American Workshop Practice." The paper was followed by a discussion.

ANOTHER large stone has been removed from the Pilkington Stone Quarry, Horwich, worked by Messrs. Dent & Sons. The quarry is noted for its huge ashlar. The stone is 13 feet 9 inches long, 5 feet 4 inches broad, and 6½ feet thick, and weighs 30 tons.

A LOCAL Government Board inquiry has been held at the Village Hall, Weybridge, by Colonel Walter Mardon Ducat, R.E., with whom was General Scott, metropolitan water inspector, in regard to the application of the Rural Sanitary Authority for the Chertsey Union for sanction to borrow 15,000*l.* for works of sewerage and sewage disposal for the parish of Weybridge and the special drainage district of Oatlands. Considerable interest was manifested in the inquiry.

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## NOTES ON NOVELTIES.

IN building a house, perhaps no article is, or should be, of greater importance both to the comfort of the tenant, and to the peace of mind of the landlord, than the cooking range. Yet how often do we find that this most necessary and useful article is both stinted in price, and put in without the slightest regard to the convenience of the future tenant. The cry of cheapness is more frequently carried to excess in the stoves and ranges than in any other portion of the building; true, there are many contractors and builders who ignore the cheap range, and are willing to pay a few pounds more to have the cooking department of the house as perfect as possible. A cheap range means continual repairs and renewals, so that in the end the balance is on the wrong side of the ledger as regards cheapness. Perhaps one reason of the indifference so often shown in selecting a cooking range is the uniform character of this article. There has always been the strong and light, the common and well-finished range; but still the principle in all has been the same, and it is only during late years that inventors have turned their attention to improving our cooking appliances. Although large sums have been subscribed to be given as prizes for fuel-economising stoves, very little progress has been made by manufacturers in meeting this want. We have, however, lately seen in operation a newly-patented cooking range, called the "Herald," made by Messrs. Russell & Sons, of Derby, who have not only had a life-long experience in this special class of trade, but who are now among the largest cooking-range manufacturers in the country; their numerous patents and specialties are well known to every member of the trade. The "Herald," their last patent, is a lifting fire range; that is, instead of using the old-fashioned false bottom grate, they lift the fire up to its work by means of a movable bottom grate. The special feature about Messrs. Russell & Sons' patent bottom grate is that there are no working parts in the fire, so that it is impossible for it to get out of order. It consists of a loose bottom grate resting upon two brackets at the back, and is kept in position whilst working up and down by bearing against two curved guides on the front of the fire-bar frame. It is perfectly loose and unattached to any part of the stove. This plan allows the fire front to be flat not curved, as in some lifting fire ranges, and roasting or roasting before the fire is consequently not interfered with. The movement of the grate is so perfectly simple and easy to work that it at once commends itself to any practical person. We

are assured that half the fuel generally used in a range can be saved by this patent. Another advantage in this range is that in summer time the kitchen is kept much cooler and is quite free from the intense heat of the ordinary close range. It is also a combined open and close fire. When the oven is not in use, the range can at once be thrown into an open fire, a great saving of fuel being the result, besides having a cheerful appearance. The great cause of complaint in the old close fire range, of not getting the bottom of the oven properly heated, is a thing of the past as regards the "Herald" range, for by a simple arrangement part of the heat is conducted direct to the bottom of the oven without first passing over the top, consequently a uniform heat is obtained all round the oven. From the simplicity of its arrangement and the great advantages it undoubtedly possesses for saving fuel, we have no doubt there will be an extensive sale for the "Herald" when it becomes better known.

## THE ARCHITECTURAL ASSOCIATION.

THE fourth ordinary meeting of the Association took place on Tuesday evening, Mr. H. D. Appleton, F.R.I.B.A., president, in the chair.

The following gentlemen were elected members:—Messrs. G. D. Curtis, J. P. Cooper, A. C. Breder, T. P. Simpson, S. W. Cranfield, H. T. Cooper, G. H. C. Cole, H. J. Potter, R. Savage, E. J. Wellman, C. F. Devitt, J. L. Williams, W. L. Lucas, W. H. Barton, T. Jenner, S. Gluckstein, J. E. Capell, M. J. Culligan, H. A. Dives, R. A. J. Paxton, H. C. M. White, V. Vaughan, W. H. Finch, E. B. Wetenhall, J. S. Millbourne, W. Stainer, H. J. Gamble, and C. S. Stone.

Mr. J. L. Robinson, R.H.A., then gave a lecture, which was illustrated with photographs shown by the aid of lime-light. He prefaced this with some introductory remarks, as follows:—

## Irish Architecture.

Mr. ROBINSON said:—Although the remains of ancient architecture now existing in Ireland are few in number and singularly devoid of detail, yet a great amount of interest attaches to them as records of the condition of the country at different periods of its history. The sepulchral tumuli which abound are the only evidence which now exists of the Tuatha de Danaans, a race which inhabited Ireland until the invasion of the Milesians about 1,000 B.C. Some of these tumuli, which

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are scattered along the banks of the River Boyne from Drogheda to Slane, are of large size. The most notable is New Grange, an artificial mound covering a long passage of upright stones, with lintels over, leading to a cruciform chamber, about 30 feet high. Some of the stones composing the passage, and those at the entrance, are covered with ornament of the simplest character, such as lozenges, zigzags, and concentric circles. The mound at New Grange is surrounded by a circle of monoliths, placed at equal distances apart. The entire internal arrangement of this tumuli bears a great resemblance to the pyramids of Egypt. Cromlechs are also very plentiful, as well as stones with ogham inscriptions, which consist in notches cut on the edges of the stones. It is probable that, with very few exceptions, timber formed the principal material used in the construction of dwellings until a comparatively recent period. The earliest examples of masonry are of a cyclopean character, the stones used being of large size, closely fitted together, and the doors and windows have sloping jambs and lintels over.

Some of the churches at Glendalough and Clonmacnoise partake of this character. In the west, rude huts of dry masonry, like beehives, are to be seen, which were used as dwellings by hermits in early Christian times. In Keeling Church, a small building attributed by Petrie to the sixth century, is an Etruscan door with a Greek cross cut in relief on the soffit of the lintel. There are several examples of stone-roofed churches or houses, the best known being St. Columba's house at Kells, St. Kelvin's house at Glendalough, and Cormack's chapel at Cashel.

The development from the lintel is easily traced; first, the lintel is scooped out to form an arch over the open, then the arch is formed of three stones, and later on many stones are used. In the same way the earlier doors and windows have square jambs without ornament; then a fillet was worked on the edge, or bead, and by degrees the ornament developed until it culminated in the beautiful and distinctive ornament to be seen at Ardger, Glendalough, Clonmacnoise, Cashel, &c. The great peculiarity of Irish—that is, pre-Norman—architecture, is the large use of interlaced ornament, which was carried at the same time to such perfection in metalwork and in illuminated manuscripts. The same ornament occurs in the doors, &c., of the later round towers, and forms the principal decoration of the crosses.

Some attention has lately been bestowed on the fact that large numbers of crosses, or rather fragments of crosses,

covered with interlaced ornament, are to be found in Scotland and the Midland counties. This is easily accounted for by the fact that, from the sixth to the tenth centuries, when the entire of Europe was overrun by barbarians, Ireland kept alight the lamp of learning and Christianity, and sent her missionaries to all parts of the world, whilst the noblest families of Europe sent their sons to be educated at the renowned colleges of Ireland. Hence the missionaries brought artificers and their art along with them, and their Celtic ornament is to be traced at Iona, Lindisfarne, through England, Normandy, Switzerland, and many other parts of Europe.

The round towers are, I may say, peculiar to Ireland, and have given rise to several theories about their origin. Some say they were built by the Phœnicians, others by the Danes, or by the Fire-worshippers, or that they were Buddhist temples. Dr. Petrie was the first to show that they were decidedly of Christian origin, by analysing each theory and exposing its weak points and contradictions. He also proved that they are never found unconnected with ancient ecclesiastical foundations; that their architectural styles exhibit no features or peculiarities not found in the original churches with which they are locally connected, when such remain; that on several of them Christian emblems are observable, and others display in the details a style of architecture universally acknowledged to be of Christian origin; and finally that they possess, invariably, architectural features not found in any building in Ireland ascertained to be of Pagan times. He then proves that they were used as belfries and watch-towers, and also as places of refuge in times of danger, the doors being placed at such a height from the ground as to favour such a theory, which is supported by the many entries in the Irish annals of forays by the Danes on the churches, and that the clergy took refuge in the Cloicktheagh, a round tower. The crosses are also almost peculiar to Ireland. Several of them are covered with figures representing Scripture subjects, the *Last Judgment* often appearing at the junction of the arms around the crucifixion. The old churches are all of very small size, the cathedral at Glendalough measuring 37 feet by 55 feet in length. The development of the ornament is easily traced in the different examples which still exist. King Urmac's chapel at Cashel, which was finished in the year 1134, is the latest and most ornate example of the style. All the arches are semicircular, the piers or pilasters square and covered with ornament, and the roof or panel vault with ribs dividing each bay. There is no doubt that but for the Anglo-Norman invasion there was

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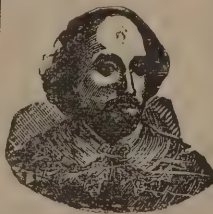


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every probability of the development of a style of architecture differing in material respects from the rest of Europe.

The architectural result of the Anglo-Norman invasion was that the invaders imported their notions of architectural taste with them, and all subsequent buildings in Ireland show similar detail to English architecture; but owing to the hardness of the building stones and the poverty and unrest of the country, the detail is generally poor and the mouldings few and shallow. All the abbeys and churches were built so as to stand a siege, and some of them differ little in appearance from feudal castles.

Notwithstanding the change in architectural style, it is surprising that the interlaced ornament still survives, and is to be seen in the capitals at Pierpoint Abbey, and in the masons' marks at Cashel, Holy Cross, and many other buildings down to the sixteenth century. The fifteenth century must have been a very flourishing time for the building trade, as most of the abbeys which now stand—whether in ruins or not—show details of that period. Any Elizabethan work is generally poor, and the only details are large mullioned windows. During the eighteenth century, and particularly during the last eighteen years, a large number of public buildings were erected in Dublin in the Classic style. The Parliament House, Four Courts, and Custom House are buildings of which any city may be proud.

The above remarks are merely introductory, as I now intend to exhibit a number of photographs done by myself of buildings from the earliest periods, and trust that you will excuse any shortcomings in the views, as, being only an amateur, my work will not bear comparison with that of men who devote themselves wholly to it as a pursuit.

A most interesting series of views were then shown, including many of the old crosses and round towers. The number of views amounted to 106 in all, and amply testified to Mr. Robinson's skill in using the photographic camera.

The proceedings terminated by a vote of thanks passed to Mr. Robinson on the proposition of Mr. S. F. Clarkson, seconded by Mr. M. B. Adams.

#### GLASGOW INSTITUTE OF ARCHITECTS.

A QUARTERLY general meeting of the Glasgow Institute of Architects was held on Thursday in last week, when there was a large attendance of members. The president, Mr.

John Gordon, occupied the chair. Mr. David Thomson called the attention of members to the facilities which the Technical College and School of Art offered for the training of their pupils and assistants. There were now excellent courses of instruction in the form of evening classes for building construction, hygiene, and drawing available for young men at a very low scale of fees, and he thought members of the Institute would do well to encourage their assistants to make use of them. Mr. Honeyman said he was glad Mr. Thomson had referred to this matter. A word or two from them to their young men, especially before the college session commenced, might have an excellent effect, and induce some to avail themselves of opportunities which might never recur. Young men should remember that the certificates of the Technical College were taken into account by the Institute in awarding their certificate, and he might also remind them that they will not now be able to join the Royal Institute of British Architects without passing an examination, and this would be greatly facilitated by attendance at the classes of the college and the School of Art, which was practically affiliated with it. The attendance at the class of building construction this session was very satisfactory, but he was sorry to say that the attendance at the class of hygiene was small. He had no doubt, however, that they might easily excite more interest in these classes among their apprentices and young men. Mr. James Thomson submitted a report from the committee on the subject of rules for the measurement of wrightwork, recommending the Institute to homologate the action of its delegates, to approve the rules for measuring wrightwork, and to authorise the secretary to issue them to members. The adoption of the report and its recommendations was proposed by Mr. Bryden, seconded by Mr. Skirving, and unanimously agreed to. Certain suggestions relative to the measurement of plumberwork by the Plumbers' Association were received and remitted to the committee on rules of measurement. A letter was read from Mr. William Clark, for many years an active member of the Institute, cordially thanking the members for the honour that had been conferred on him on his election as an honorary member. Mr. T. L. Watson handed in the report of a paper read before the Philosophical Society of Wellington, New Zealand, by Mr. Thomas Turnbull, F.R.I.B.A., and member of the Glasgow Institute of Architects, on the subject of "Building Construction with reference to Earthquakes." Mr. Turnbull was cordially thanked for the communication. Mr. W. F. Salmon called attention to the want of an architectural museum in Glasgow, and proposed that some step should be taken with

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a view to the formation of a collection of architectural drawings, photographs, and other objects. The matter was remitted to a committee. Mr. D. Thomson made some suggestions regarding the membership of the Institute, and a committee was appointed to consider them.

### THE GORDON STATUE.

THE following interesting communication [from Mr. Hamo Thornycroft, R.A., appears in the *Magazine of Art* for this month :—

At first it was proposed that the statue should be placed as a pendant to that of Havelock—the statue of Napier to be removed farther back in the Square to make room. To this removal there proved to be some serious opposition. This I did not regret, as the task of making a pendant to the Havelock monument did not fill me with delight; for I am strongly of opinion that the scale of this statue is entirely wrong, and detrimental to the effect of the Square. I preferred rather having a site farther back in the Square for the Gordon, where I could have a freer hand, and could aim at making a statue whose scale, at any rate, should be in proper proportion to those buildings around most worthy of consideration, namely, the National Gallery (which is really a beautiful building), the church of St. Martin's, and the College of Physicians. That portrait-statues in public places should have a relation to the buildings in their immediate neighbourhood, and not to abnormal structures, such as the Nelson column, is, I think, not to be questioned. We have removed one monster to the wastes of Aldershot, and there are still others which might, at any rate, be reduced in scale, if we are ever to beautify London. It is a vain hope, perhaps, but I should like to live to see a smaller copy of Foley's Prince Consort placed under the golden canopy in Kensington Gardens in lieu of the gilded Colossus now there.

The Gordon monument consists of a bronze statue of the hero, 10 feet 6 inches high, and a lofty decorated pedestal, containing on two sides of the shaft bronze panels in low relief. The subjects are allegories—the one "Fortitude and Faith," and the other "Charity and Justice." Gordon appears as an English staff officer, wearing a patrol jacket, but without belts, sword, or weapon of any kind, except his famous short rattan cane, or "Wand of Victory," as it came to be called during his

celebrated China campaign. Weapons he never wore, even in his most daring undertakings. His arms are almost in the folded position, but the right hand is raised up to the chin, while the left firmly grasps a Bible beneath his right elbow. Slung at his back is a binocular field-glass. He stands firmly on the right foot, the other is raised on a broken cannon. This latter I introduced to give a military environment to the figure, and at the same time to express his dislike to bloodshed and war—as if, so to speak, he would wish to put his heel upon it. The whole aspect of the statue I wished to be resolute, solitary, but not sad. I have had the advice and assistance of Mr. Waterhouse in the design of the pedestal. This is composed of hard Derbyshire limestone, known as Hopton Wood stone, which, unlike the depressing, interminable, never-changing grey granite all around, lends itself to the sculptor's chisel, so that the cap, or cornice of the pedestal is here carved with appropriate ornament and scroll, giving the names of Gordon's famous campaigns and victories. The upper pedestal, or sub-plinth, to the statue, is enriched with bronze wreaths and festoons of honour to the man above. The proximity of the high terrace at the back required that the pedestal should be high, so that the whole monument measures 29 feet in height.

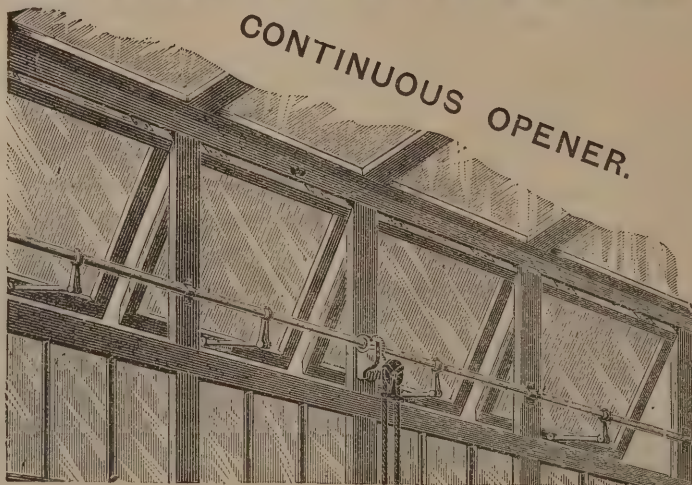
### PURIFICATION OF THE CLYDE.

At the last meeting of the Health Committee of the Glasgow Town Council, Bailie Crawford submitted a report respecting a scheme for the purification of the River Clyde. In carrying out a remit from the committee to visit various towns in connection with "cleansing" matters, he said he had, as directed, taken the opportunity of observing the methods of sewage purification in operation at the several places visited. He had been at Birmingham, Nottingham, Croydon, Berlin, Paris and other places, and at none of them had he seen anything to alter his opinion expressed to the committee some time ago—that it was quite practicable to purify, and at the same time utilise, the sewage of Glasgow, by irrigating the plains of the Cart and Gryffe, called in earlier times Strathgryffe. By irrigation he did not mean that the sewage was simply to flow over the land, but was to be filtered through it—practically, the process which had been termed "Intermittent downward filtration." After alluding to former schemes in Glasgow for dealing with the sewage, and referring to the measures adopted in the towns he had visited, Bailie Crawford went on to say

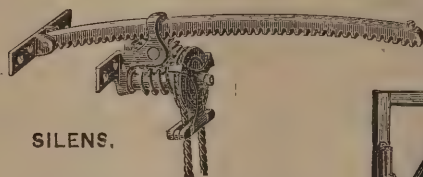
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that the natural collecting point for the sewage of Glasgow seemed to be immediately below Govan. From this the sewage would be forced through cast-iron pipes direct to the most suitable points on the irrigation farm which would be established. Or an alternate, or, perhaps, the better plan would be to have the rising mains delivering the sewage into a large covered conduit formed about 50 feet above ordnance datum, and to a length of about 1½ miles on the ridge from North Hillington to Arkleston. Thence it would gravitate through pipes syphoning under the White Cart, &c., into the open main carriers on the farm. The whole cost of the works he estimated would be covered by 880,000*l.*, with an additional sum of 620,000*l.* for the proposed irrigation farm (about 4,500 acres) and stock. On the working of the farm he was prepared to expect an annual loss of about 6,000*l.*; while the scheme would entail other annual charges amounting to 38,300*l.*—making an annual amount of about 44,300*l.* to be provided by the rates. This large sum, spread over the estimated rental of "Greater Glasgow" (4,386,833*l.*), would, he said, be covered by a rate rather less than 2½*d.* per *l.*; and he proposes that the total capital expenditure on the interception works, &c., be reduced in sixty-six years.

#### NEW CITY OF LONDON COURT.

THE new City of London Court was opened on Thursday by the Lord Mayor in state, attended by Mr. Alderman and Sheriff Gray and Mr. Sheriff Newton. It is situated on the south side of Guildhall Buildings and on the west side of Basinghall Street, and occupies the site of the old Court buildings, the old Land Tax Offices, and the "Tap" of the Guildhall Tavern. When the lease of 84 Basinghall Street expires, which will happen in the course of a few years, the building will be extended (says the *City Press*) over those premises, and it may be mentioned that the plans have been designed with that view. The ground floor consists of the offices for the staff of clerks and bailiffs, the former of whom are increasing from time to time in order to cope with the large growth of the business; while on the upper floor, to the west, is placed the Judges' Court, some 45 feet by 26 feet, to the east the Registrar's Court, 36 feet by 26 feet, each with a private room attached, and approached by a separate stair and entrance. The principal and public entrance is in the middle of the façade to Guildhall Buildings, and opens into a spacious hall

which gives access, right and left, to the offices on the ground floor, and to a staircase leading to the courts on the floor above. The lavatories, furnace, record-rooms, &c., are in the basement. The building has been designed in the late Gothic style of architecture, which was also adopted for the Guildhall Library and the new Council Chamber, in order to harmonise with the ancient Guildhall, which was built, as is well known, in the early part of the fifteenth century. The external moulded work is in Portland stone, with grey granite plinths, while the walling is of Kentish ragstone.

Turning more particularly to the internal arrangements—the hall and staircase, the latter of which is very wide, and presents an excellent appearance, are of Bath stone, the hand-rail of polished Hopton Wood marble; the open roof of oak, with ribs springing from four griffins, also of oak. The two upper windows are of tinted glass, sprinkled with a pattern of roses and crowns. The south window contains the armorial bearings of the Lord Mayor, Mr. B. S. Foster MacGeagh, J.P., the chairman of the Law and City Courts Committee, and of Mr. H. H. Bridgman, architect, the late chairman of the committee. In the north window are the arms of the City, and of Mr. Alderman and Sheriff Grey and Mr. Sheriff Newton. Mention should be made of the fact that the judges and registrar's courts are particularly well lighted. The flooring of the upper and lower halls is of Deispecker's marble mosaic. The appearance presented by the two courts is quite in keeping with the purpose for which they are intended. In the judges' court the members of the legal profession will enter by doors on either side, while ample accommodation is made for the public at the back of the court. The courts have panelled wainscot ceilings, from which are suspended brass gaseliers; while over the judge's chair at the west end of his court is a canopy of wainscot, French polished. The seats, doors, fittings, &c., are also of wainscot. The building has been erected in just over twelve months, the foundation-stone having been laid by the Lord Chancellor on November 23, 1887. Mr. Andrew Murray, F.R.I.B.A., the architect, deserves much praise for such an admirably suitable building. The general contractor for the building and fittings was Mr. J. Morter, of Stratford; for the heating apparatus, Messrs. J. Wontner Smith, Gray & Co.; for the brass gaseliers and brackets, Messrs. G. Forrest & Sons; and for the judges' and other chairs, Messrs. Cooper & Holt. Mr. Merifield has acted as clerk of the works during the construction of the building.



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## SHEFFIELD SHIP CANAL.

THE plans and works in connection with the proposed new canal from Sheffield to the sea have been deposited at such places as are required by the Standing Orders of Parliament. Commencing at the Sheffield end of the scheme, it is proposed to take seventy acres of vacant land, mostly belonging to the Duke of Norfolk, near Brightside Lane, and there to construct a dock seventy acres in extent, with quays and all other buildings and appurtenances necessary to the loading and unloading of vessels. In course of time warehouses, docks, and so forth will be erected. The docks will be close to the principal works, where heavy goods are produced. From thence a new and shorter cut will be made through Carbrook, where a considerable quantity of cottage property will be swept away, and on to Tinsley, where it will join the existing canal. Thence it will pass through Rotherham, Mexborough, Swinton, Doncaster, and other populous towns, following the course of the canal belonging to the River Don Navigation Company, and on to Stainforth. At a point near to the Keadby railway junction the canal will join the Stainforth and Keadby canal, and go on to the river Trent and Keadby, where the river is navigable. The canal will be 80 feet wide and 15 feet deep, and will, it is believed, prove a great boon to the heavy industries of the district.

## WEST OF SCOTLAND SANITARY ASSOCIATION.

The annual general meeting of the West of Scotland Sanitary Association was held on Monday afternoon in Glasgow, Sir James King, the Lord Provost, presiding. The seventh annual report by the Council showed that during the year 173 members had resigned and that 170 new members had joined, leaving the membership at September 30 last at 354, being a falling off of three. While the benefits to be derived from the work of the Association were more and more appreciated at a distance, the Council regretted that those benefits were so little appreciated in the city. Many members joined the Association for one year, and obtained more than their money's worth in the form of a minute inspection and detailed report. Satisfied with this, they left the Association to take care of itself for the future. The object of the Association, however, was by yearly examinations to insure that the houses of its members con-

tinued in a sanitary condition. It was also stated that the guarantee fund had been dispensed with this year. The financial statement showed that the receipts had been 728*l.* 5*s.* 11*d.*, and the expenditure 515*l.* 2*s.* 10*d.* Mr. John Ure and Professor M'Call Anderson were among the speakers. Professor Gairdner submitted the list of office-bearers and council, and moved its adoption, which was seconded by Colonel Reid, and approved.

## AMERICAN versus ENGLISH AND ITALIAN LABOUR.

AN interesting discussion is published in a recent number of the American trade journal *Stone*, upon the relative value placed upon American and English labour, under the heading of "Marble and the Tariff." This journal had severely attacked the Mills Bill, which proposed to reduce the tariff on marble by 20 per cent. It pointed out that work which cost 66*¢* 47 dols. in the States could be obtained for 13*¢* 33 dols. in Italy, and that, as a consequence of the tariff, every penny of the difference went into the pockets of the American workmen. This view of the case is opposed by an English firm of marble merchants, Messrs. Arthur Lee & Bros., of Bristol, who affirm that the calculation made as to Italian labour is erroneous, and that the difference should be as between 66*¢* 47 dols. and 34*¢* 26 dols. They further contend that the apparent difference in favour of the American worker is illusory, owing to the high cost of living in the States, and that as a result of free trade in England, the English workman is enabled to live cheaply, while at the same time he has succeeded in beating the Italian on his merits without a tariff. They say, "Our workmen have to compete with the labour of the world; they do so by cutting and contriving, and by a continual improvement of mechanical appliances. What follows? Take our own case; some years ago we manufactured a good deal of monumental work in Italy, now we do most of it in this country, quite as cheaply and of very far better quality. Our men get good wages and live cheaply, but to enable them to do so we are continually improving our mechanical appliances. We are importing rough marble into England, working it here, and re-exporting it to better advantage than by working it in Italy; we therefore find labour for Englishmen which was done by Italians. On the other side we hear of American firms who set up factories in Italy, and employ Italian labourers for work

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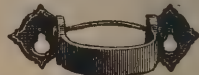
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which was once done by Americans. This is the only way in which they can retain a vestige of export trade. We leave it to you to say which course brings most labour to a country." The editor of *Stone* admits that the argument adduced by his correspondents is "plausible," but asks, "What does it matter if the American working-man might under a free trade policy pay less for the necessities of living? Under protection he has undeniably more money to spend, and we assert it as a good principle that it is better to spend a dollar here for what may be obtained for fifty cents in England than to have only the lesser sum to economise on." He goes on to observe that if the Americans had not a home market in which to dispose of their products "we might be put into somewhat similar condition to the English people, who must perforce look outside their own domain for the material to furnish labour with something to do, and other markets than their own in which to dump their products. The American market belongs to the American working man, and in this particular instance of the marble industry, the tariff of fifty per cent. ad valorem on the manufactured article should be increased to as nearly a prohibitive standard as possible, rather than reduced twenty per cent., as the pro-Italian Mills Bill proposes." The effect produced by opinions of this kind upon the fortunes of a party suspected of free-trade leanings can be easily understood.

#### REGISTRATION OF PLUMBERS.

At a meeting held at the Lambeth Polytechnic Institute, the Lord Mayor said that in going through their workshops he was delighted beyond measure to see they had a class for practical plumbing. There was no greater need at the present time than a perfect knowledge of sanitary science. One of the livery companies of the City (the Plumbers' Company) had established a system of registration for plumbers, and at the last examination twenty out of thirty were rejected. It might be asked, Why should plumbers be registered? He would answer, Why should chemists be registered? The object was that they might not poison their neighbours; but where a chemist poisoned one, bad plumbing poisoned fifty. Therefore he said, "Go on with your plumbing classes and your technical schools, and the probability is you will greatly improve the condition in which you live."

#### STEAM-ENGINE EFFICIENCY.

At a meeting of the Society of Engineers, held at Westminster Town Hall on Monday evening, December 3, 1888, Mr. A. T. Walmisley, president, in the chair, a paper was read on "High-pressure Steam and Steam-engine Efficiency" by Mr. W. Worby Beaumont, M.Inst.C.E.

In the first part of the paper attention was again called to the misleading results of the common application of the theory of the perfect engine as a basis for an index to the comparative efficiency of actual engines, working under different conditions and with different pressures. Examples of the reasoning based upon this interpretation of the "Carnot" theorem, or this application of the "Carnot" ratio, were given as showing that it had been common to suppose that the useful limit to steam pressure would be reached at about 200 lbs. or below it. Reasons for expecting very large increase in available work as due to the increase of pressures up to at least 300 lbs. were given, with figures showing the extra work available per extra unit of heat used.

In dealing with the steam-engine as a heat-engine, it was argued that considerations relative to the boiler as the producer of the steam and as the receiver of the hot water rejected by the engine are irrelevant, and, further, that no part of the history of the steam used should be included other than that which begins with the admission of the steam into the cylinder and ends with its emission therefrom.

In estimating the quantity of steam required to perform a given quantity of work, the steam necessary to fill the cylinder at the pressures shown by indicator diagrams was not credited with providing any of the heat necessary for the performance of the work, excepting only the units of heat represented by the difference between the total heat of steam at the initial and at the terminal pressures. In a non-expansive engine the whole of the heat equivalent of the work done would have, according to the paper, to be supplied in addition to that represented by the volume of steam required to fill the cylinder.

This heat was assumed to be supplied by initial condensation, and an object of the paper was to show that the performance of work alone demands sufficient heat to account (with the exception of some very small losses) for the whole of the observed initial cylinder condensation. Proceeding on this thesis it was argued that cylinder condensation apart from this is a very small quantity in the best actual engines, and that it consists mainly in loss of heat by evaporation during exhaust,

ESTABLISHED 1790.

# THE "WASH-OUT" CLOSET

(PATENT).

THREE AWARDS AT THE INTERNATIONAL MEDICAL SANITARY EXHIBITION,  
SOUTH KENSINGTON, 1881.

No. 201.



"How to Drain a House," from a paper by T. MELLARD READE, Esq., C.E. F.R.I.B.A., read before the Liverpool Architectural Society: "I consider the pan-closet objectionable, especially since the introduction of the two-gallon regulating cistern has increased the difficulty of getting the after-flush to fill the pan. The 'container' is usually a reservoir coated with filth, hidden by the pan holding the water in the basin. A basin with a trap at the side or back, called a 'WASH-OUT' basin, is a far better apparatus."

"Improvement on Sanitary Condition of Houses," from a paper by J. CORBETT, Esq., read before the Social Science Congress, Manchester, 1879: "We replace defective Closet Appliances by the simple 'WASH-OUT CLOSET,' which is of white earthenware, without any valve, and so perfectly self-cleansing as to require very little attention."

Extract from a letter by "M. O. H.," a Medical Officer of Health, *Daily Telegraph*, September 22, 1880: "The Local Government Board forbids the use of these pan-closets. . . . They may be easily replaced by one of the 'WASH-OUT' CLOSET Basins."

Extract from a lecture by W. EASSIE, Esq., C.E., at the International Health Exhibition, May 28, 1884: "A cleanly 'WASH-OUT' Flushing Rim Basin in connection with a small Flushing Tank overhead which merely required a touch of the depending chain and ring to liberate the whole contents."

No. 250.



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and of slight losses due to radiation and conduction, and to clearance space not filled at initial pressure by compression. From this it was concluded—

1. That as small a portion of the cylinder capacity as possible should be subject to exhaust influences.
2. That it follows from 1 that multiple stage expansion is necessary with the high pressures that are advisable, and that high speeds of rotation ought to be attended with economy.

### THE CITY MARKETS.

At last week's meeting of the Court of Common Council, the Markets Committee submitted plans for the appropriation of a portion of the land north of Charterhouse Street as a site for a fruit and vegetable market, at an estimated cost, for works, of 15,500*l*. The committee had had an interview with the tenants of Farringdon Market, who explained the practical requirements of their trade in view of a new market, viz., a level area, a large space for each tenant, no building involving masonry, but simply a roof on the columns, with shelves, and moderate rents. They accordingly instructed the City architect to prepare a plan of a cheap and light structure, which he had done. The site proposed to be occupied abutted on Charterhouse Street and Farringdon Road. The building would cost 15,500*l*. The scheme seemed so thoroughly in harmony with the views of the trade, as regarded its general character and moderate cost, that the committee had no hesitation in looking favourably upon it, more especially as it brought into rental land which had remained for some years unproductive. As soon as a new fruit and vegetable market was provided, Farringdon Market would be discontinued, and the site disposed of. It was estimated the annual expenses of the market would be 3,645*l*., and that the rentals and tolls would bring in 4,657*l*., leaving a surplus income of 1,012*l*.

Mr. Perkins moved the adoption of the report, and stated that the area proposed to be utilised had been vacant for twenty-five years. The land would give them an extra area for market space of nearly 60,000 cubic feet. Everyone was agreed that the present Farringdon Market, being built on the slope of a hill, was excessively inconvenient, and all the tenants would remove, he believed, to the new market when completed.

Mr. Hicks urged that the proposed buildings would be a disgrace to the Corporation, which had already expended large sums in market experiments. For instance, the Fish Market

in Farringdon Street had involved an annual loss of 10,000*l*. to the Corporation. They had recently opened another fish market in the same locality, but they could not seriously believe that it would be a success. He moved, as an amendment, "That the report do lie upon the table."

Mr. Deputy Bedford said in a few months they would have the new County Council, and it might be that they would take in hand the establishment of markets in various parts of London. If so, the Corporation would then discover that they had spent a vast sum uselessly.

After a long discussion the amendment was negatived by 108 votes to 28, and the report was agreed to.

The Markets Committee brought up another report on the vacant land opposite Billingsgate Market about to be acquired from the Commissioners of Sewers. They proposed that a building should be erected with 38 stalls on the ground level, with 15 vaults in the basement, and with 43 offices in the upper floors. The cost would be 19,215*l*., and the annual expenses 4,514*l*., while the rentals would amount to 5,245*l*., leaving a margin of profit of 731*l*. This would much increase the accommodation for the fish trade at Billingsgate.

The report was adopted, and the Court adjourned.

### PRIVATE BILL LEGISLATION.

ON the evening of Friday in last week, in accordance with the provisions of the Standing Orders, plans in relation to schemes of Private Bill legislation which it is intended to promote in the next session of Parliament, were deposited at the Private Bill Office of the House of Commons, having reference to 161 measures, of which 47 related to railways, 14 to tramways, 54 to miscellaneous schemes, and 46 were Provisional Orders. The following is a list of the Bills:—Great Northern Railway, South Eastern Railway, London, Chatham and Dover Railway, Midland and South Western Junction Railway, North West Central Railway, Corporation of London (Tower Bridge), Midland Railway, London and North Western Railway, Metropolitan Railway, Great Western Railway, North Eastern Railway, Volunteer National Rifle Ranges and Camp (Cannock Chase), London Imperial Docks Bill, Metropolitan Improvements, Monumental Chapel (Westminster Abbey), Rickmansworth and Uxbridge Valley Water; Southend-on-Sea Harbour; Harpenden Water, Provisional Order; Kensington and Knightsbridge Electric Lighting Company, Provisional Order; Lea

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Bridge, Leyton and Walthamstow Tramways; Southwark and Deptford Tramways; Metropolitan Electric Supply Company (Limited), North London, Provisional Order; Metropolitan Electric Supply Company (Limited), West London, Provisional Order; Metropolitan Electric Supply Company (Limited), South London, Provisional Order; Metropolitan Electric Supply Company (Limited), Mid-London, Provisional Order; Marlow Water, Provisional Order; Notting Hill Electric Lighting Company (Limited), Provisional Order; Romford Gas; Westminster Electric Supply Corporation (Limited), Provisional Order; London Electric Supply Corporation Electric Lighting, Provisional Order; London Central Subway Railway; West Metropolitan Tramways (Extension); London Tramways Company (Limited) (Extensions); East Kent District Water; South Kent Water Bill, and Harrow Road and Paddington Tramways Bill. Last year the plans deposited on the last day of November numbered 157, of which 58 were railway measures, 15 tramway, 46 miscellaneous, and 38 Provisional Orders.

### THE PARIS EXHIBITION.

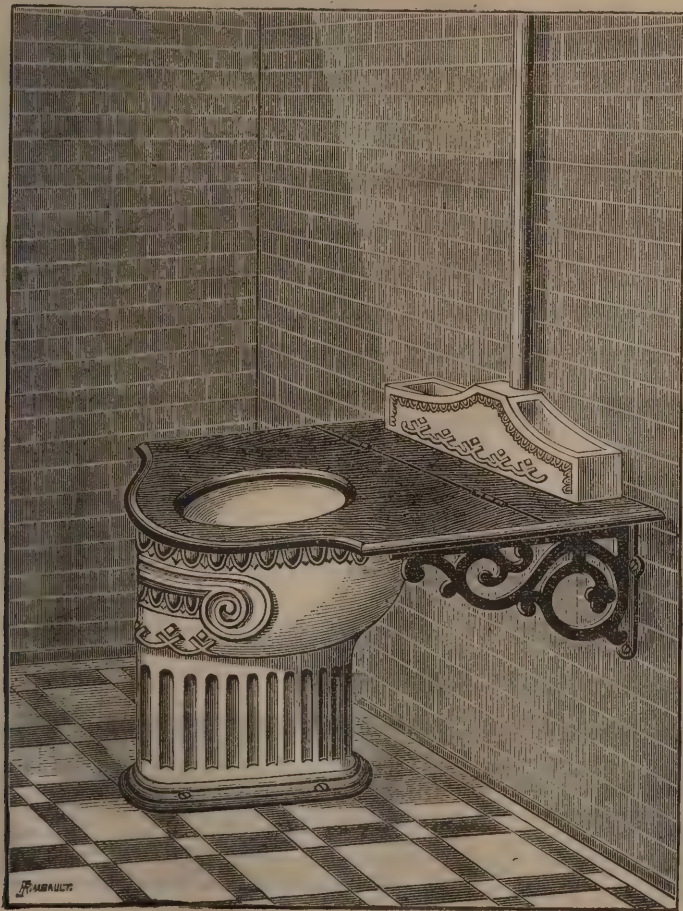
A MEETING of the Executive Council of the British Section of the Paris Exhibition, 1889, was held last week at the Mansion House. Alderman Sir Polydore de Keyser presided. Mr. H. Trueman Wood, one of the secretaries, reported that the whole of the space placed at the disposal of the British Section had been allotted among exhibitors. Various colonies had desired to participate, but the most urgent appeals to the French authorities had failed in obtaining any extension of the original amount of space granted. The committee, however, had been able to devote a considerable space in the south-east part of the section to Victoria and New Zealand, as well as one of the three galleries on the Quai d'Orsay, which had been allotted to Great Britain and the colonies. Space in another of these galleries has been handed over to the Cape of Good Hope. It was believed that the Kimberley diamond mines would have an exhibit in the precincts of the Exhibition. With regard to the printing of the catalogue and guide, the tender of Messrs. W. Clowes & Sons, Limited, had been accepted. There was every likelihood of an adequate representation of British art, and promises of support had been received from many leading artists. Considerable progress had been made in the decoration of the British Section under the honorary superintendence of Mr. J. H. Donaldson, a member of the committee. Many of

the provincial municipalities were contributing banners and flags for the purposes of decoration. The Lord Mayor (Mr. Alderman Whitehead) had become president of the General Committee, Sir P. de Keyser, his predecessor, continuing to act as chairman and treasurer of the Executive Council. The committees for the Social Economy and Anthropological Sections had been at work, and expected as many exhibits as the French authorities would be able to find room for, an independent committee had been formed for a Retrospective Exhibition of the means of transport, and there seemed every reason to believe that the result of the operations of the committee would also be thoroughly satisfactory. Sir Frederick Leighton, P.R.A., adverting to the Fine Art Section, said in view of the fact that in Paris in 1878 England had been represented very worthily in matters of art, and obtained very considerable renown and reputation, which had been maintained by the Art Sections at Munich and Berlin, it would be damaging if British art was not well and excellently represented next year. The expenses of freight, insurance, and other matters would be about 3,000*l.* if any number of works of art of the highest class were lent for exhibition, and he hoped the Council could see their way to increasing their grant for the Art Section. Sir J. D. Linton, P.R.I., concurred in the views of Sir F. Leighton, and the Council unanimously voted, including previous grants and donations, 2,000*l.* towards the expenses of the Art Section. Sir F. Leighton said with that sum they could make a commencement, and could found an appeal not only to the public for donations, but to collectors and artists for the loan of suitable works of art. On the motion of Mr. Ernest Hart, seconded by Mr. Woodall, M.P., it was resolved unanimously, "That Sir Polydore de Keyser be nominated executive president, and Mr. H. Trueman Wood commissaire délégué of the Council in Paris."

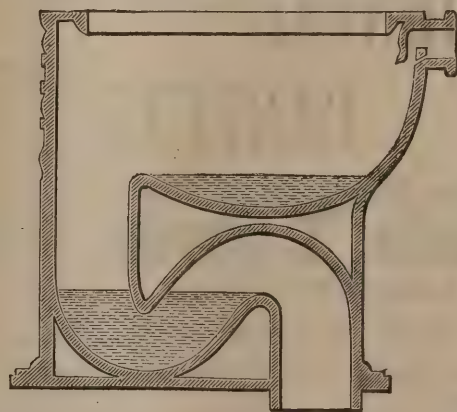
### GOVERNMENT BUILDING CONTRACTS.

A DEPUTATION from the London United Trades' Committee of Carpenters and Joiners waited upon Mr. Plunket, the First Commissioner of Works, at the House of Commons on Tuesday, to urge upon him the desirability of certain alterations in the rules at present in force with respect to Government building contracts. Mr. Broadhurst, M.P., who introduced the deputation, said they wanted specially to call the attention of the

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First Commissioner to the practice of subletting portions of contracts, a practice which led to the evils of the sweating system. The Trades' Committee proposed that in future Government contracts the contractors should engage not to sublet portions of the work to middlemen; that they should not allow their men to work overtime save in cases of urgency, and that they should pay the standard rate of wages and otherwise conform to the rules and customs of the building trade. Mr. Plunket, in reply, said he could not undertake to regulate the rate of wages to be paid by the contractors, but that he would endeavour to prevent as far as possible the system of subletting.

#### BUILDERS' BENEVOLENT INSTITUTION.

THE forty-first anniversary dinner in aid of the funds of this institution was held on Thursday, the 29th ult., at Carpenters' Hall, London Wall. Mr. J. Howard Colls, president of the Institution, occupying the chair. The President was supported by Mr. Alfred Rosher (Master of the Carpenters' Company), Mr. John Aird, M.P., Mr. H. H. Bartlett, Mr. Arthur Lucas, Sir George Chubb, Professor Roger Smith, Mr. Thomas Blashill, Mr. Chatfield Clarke, Mr. Rickman, Mr. Banister Fletcher, Mr. G. Burt, Colonel Stanley Bird, and other friends of the Institution, the company numbering about 230.

The Chairman gave the toast of "Her Majesty the Queen, the Prince and Princess of Wales, and the rest of the Royal Family."

Mr. J. W. Hobbs (Mayor of Croydon) gave "The Army and Navy," Major Brutton replying for the army and navy, and Colonel Stanley Bird for the Reserve forces.

Sir George Chubb gave "The Houses of Parliament," for which Mr. John Aird, M.P., responded.

The Chairman, in proposing the toast of the evening, "Success to the Builders' Benevolent Institution," remarked that charitable institutions were the pride of this country and the envy of other nations. The builders had not been backward in the good work, and he was proud to say that the most distinguished members of the trade had been his predecessors in the chair. The members of all professions and trades were liable to misfortune and reverse. The business of a builder was deeply interesting, and there was nothing monotonous about it except Saturday night. It was a manufactory of a vast number of articles, subject to difficulties above and below

ground. Sometimes intense heat brought its calamities, and at other times intense frost or too much wind. The responsibility of the builder never ceased, but lasted as long as he lived, for if anything went wrong he was sure to hear of it. He did not wish to say anything against the professions with which they were associated. As a rule, nothing could be fairer than the treatment the builders received at their hands; but, at the same time, many of the claims on this institution came from men who had suffered from the exceptions to that rule—from the architect who had supplied defective drawings, and from the specifications of inefficient quantity surveyors. Any of those troubles were likely to lead to disaster, and they ought to remember that however stable they might feel at the moment, any one of them might encounter such a calamity as would make them glad to apply for help to such a society as the Builders' Benevolent Institution. The institution had been suffering from the depression of trade, and the subscriptions had fallen off. If there was a time when an institution like this ought to be supported it was in times of depression, and he asked them to support him, and show the world that the builders were a benevolent race. The chairman added that, as Mr. George Plucknett, J.P., the hon. treasurer, was not with them that evening, they would simply drink the toast without reply.

The toast was duly honoured.

The Chairman next proposed "The Health of the Carpenters' Company," referring to the kindness of the Company to the building trade, or any branch of it.

Mr. Alfred Rosher, Master of the Carpenters' Company, replied, and remarked that it was the duty of the Company to do what they could for the advancement of the craft.

Mr. Arthur Lucas gave "The Health of the Chairman and President," adding that every one who knew Mr. Howard Colls knew that whatever he undertook he entered into *con amore*, and it would be difficult to find a worthier occupant of the presidential chair.

The toast was cordially received, and the Chairman replied in suitable terms.

Mr. H. H. Bartlett proposed "The Architects and Surveyors." He said the presence of so many members of the professions showed their sympathy with the builders. The work done by the architects of the present day would, he believed, stand comparison with that of any of the great architects of the past. In fact, there was no great thoroughfare in the metropolis in which they could not see works rising

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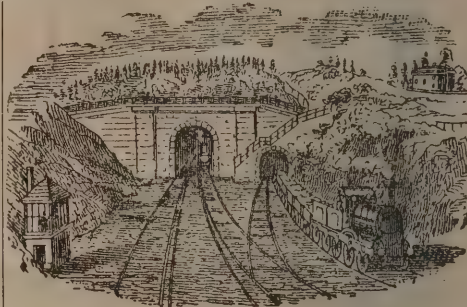
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around them which must tend to elevate the taste and character of the people. In olden times the architect and surveyor were coupled together; but the less that was the case the better, as the surveyor should hold the balance between the architect and the builder. He coupled with the toast the names of Mr. Chatfeild Clarke and Mr. Rickman.

Mr. Chatfeild Clarke said he believed at times the architects must be looked upon as ogres, but that feeling was passing away, and builders felt they could not trust themselves more comfortably than in the hands of a respectable architect. At the same time the architects never could carry out their works successfully without putting their trust in a responsible and respectable builder. They were, therefore, there in a sort of partnership, and it was a sincere pleasure for him to be present.

Mr. Rickman responded for the surveyors.

Mr. Maton proposed the concluding toast, "The Vice-Presidents, Committee, and Stewards," which was responded to by Messrs. T. F. Ryder and J. T. Bolding.

In the course of the evening subscriptions and donations amounting to 1,053*l.* (of which sum 804*l.* appeared on the President's list) were announced.

### PATENTS.

*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.*

#### APPLICATIONS FOR PATENTS.

17058. James William Felts, for "Drawing-up and letting-down window-blinds, without the necessity of opening the window." November 23, 1888.

17059. John Miller Brockie, for "A window or sash-fastener, proposed to be called the 'Simplex.'" November 23, 1888.

17091. Clement Hamil, Perrot, Arthur Abershon, and George Henry Boardman, for "Improvements in register doors." November 24, 1888.

17174. Henry Claude Walker and Robert Falkland Carey, for "Improvements in lifts, hoists, and the like." November 26, 1888.

17176. Richard Nicholls, for "Improvements for obtaining light and heat, and in apparatus employed therefor." November 26, 1888.

17186. William Robert Maguire, for "Improvements in and relating to water-closet basins, wash-basins, and the like." (Complete specification.) November 26, 1888.

17215. Antonio Richardson, for "An improved window or sash fastener." November 27, 1888.

17250. Thomas Bonsall Edwards, for "Improvements in fire escapes and ladders." November 27, 1888.

17251. William Vaux Graham, for "Improvements in the filtration or straining of sewage or sewage sludge, or any fluid containing solid matter in suspension, and in apparatus to be used therefor." November 27, 1888.

17257. William Cussans, for "Improvements in colouring and ornamenting Portland cement, for the manufacture of imitation grained or figured marble mosaics, ornamental slabs, tiles, and other forms, either plain or in mixed colours." November 27, 1888.

17288. Charles Lindsay, for "Art decoration of register grates or stoves." November 28, 1888.

17293. John Gullery, for "Improved steam trap, or self-acting tap." November 28, 1888.

17302. William Henry Jenkins, for "Apparatus for supply of hot and cold water." November 28, 1888.

17307. Joseph Trickle, for "A self-closing draw-off tap." November 28, 1888.

17311. Amelia Jane Kent, for "Improvements in making india-rubber mats, covering treads of stairs, landings, floorings, and similar wearing surfaces." November 28, 1888.

17351. Robert Bocock, for "Starting a syphon in cistern, the same to be called 'Lindum Syphon Cistern.'" (Complete specification.) November 29, 1888.

17363. James Hargreaves, Thomas Robinson, and John Hargreaves, for "Improvements in the manufacture of cement and in apparatus employed therein." November 29, 1888.

17415. Adolf Katy, for "New or improved blocks for building purposes, and means for constructing the same." November 29, 1888.

17418. John Suttie Stark and Arthur Hodgkin Scarfe, for an "Improved portable telescopic ladder for use as a fire-escape, and for other purposes." November 29, 1888.

17424. James Murrie, for "Improvements in and relating to feed-water mechanism for steam boilers, partly applicable for

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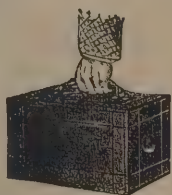
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Fig. 2.



steam-traps and other analogous purposes." November 29, 1888.

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15136. Edward Cain, for "Improvements in and relating to weather-strips of doors for excluding draughts." October 22, 1888.

15398. Henry George Planner, for "A disinfecting apparatus for water-closets, urinals, drains, sinks, and the like." October 26, 1888.

15465. William Cunningham, for "Improvements connected with pulley-trucks and ropes or chains of traveller, raising, lowering, and conveying apparatus." October 27, 1888.

15568. Benjamin Richardson and Edward Dickinson, for "Improvements in guards for brick-making machines." October 29, 1888.

15605. Ludwig George Barber, for "A compact ladder." October 30, 1888.

15621. Elias Lyon, for "Improvements in decorative window panes or panels, and in the manufacture thereof." October 30, 1888.

15879. John Clayton and Charles Tindall, for "Improvements in and relating to waterclosets." November 3, 1888.

15920. John Henry Lightbody, for "Improvements in the manufacture of water cisterns and other analogous articles." November 3, 1888.

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1161. Athol John Capron, for "Improvements in the purification of sewage and impure waters." January 25, 1888.

1199. Alfred Brown, for "An improved ventilator for rooms, halls, public buildings, churches, and also for chimneys." January 26, 1888.

1255. Joseph Kaye, for "Improvements in apparatus for

bolting and unbolting doors, windows, and the like." January 27, 1888.

1264. Joseph Shackleton, for "Improvements in, and connected with, heating apparatus, water-closets, and lavatories for railway cars." January 27, 1888.

1294. James Cliffe, for "Improved fibrous asphaltic composition for rendering concrete roofs, railway arches, walls, and other structures waterproof and damp-proof, and in the method of applying such composition." January 28, 1888.

1321. Philip Gallimore, of the firm of Wells, Gallimore & Taylor, for "Improvements in, and additions to, portières, or curtain-rods for doors." January 28, 1888.

1389. Ottomar Erfurth, for "An improved holder or support for scaffolding." January 30, 1888.

7878. George Andrew Hobson, for "An improved construction of metal floorings or roofings for bridges, and other structures." May 29, 1888.

#### PATENTS SEALED, NOVEMBER 30, 1888.

12640. Frederic Barnett, for "Improved self-lowering and adjusting metallic or other fireproof material shutters, for prosceniums of theatres and music-halls." September 17, 1888.

14554. Robert Bristowe Lee, for "Improvements in the manufacture of concrete and cement fireproof building materials, and parts of buildings, bridges and other structures, safes, strong-rooms, slabs, blocks, baths, tanks and other articles, parts and receptacles." October 26, 1887.

14716. Alfred James Hopkins, for "Improvements in means of, and apparatus for fastening and securing blocks of wood and analogous substances in position when used for flooring and other purposes." October 29, 1887.

15355. Alexander Patrick, for "Improvements in brick-making machinery." November 10, 1887.

15519. Stephen Holman, for "Improvements in means or appliances for exhausting and consuming foul air or gases, and for effecting ventilation of the same; applicable also for heating purposes." November 12, 1887.

15969. Brierley Denham Healey, for "Improvements in outlet valves for sewer, flushing-tanks and other purposes." November 21, 1887.

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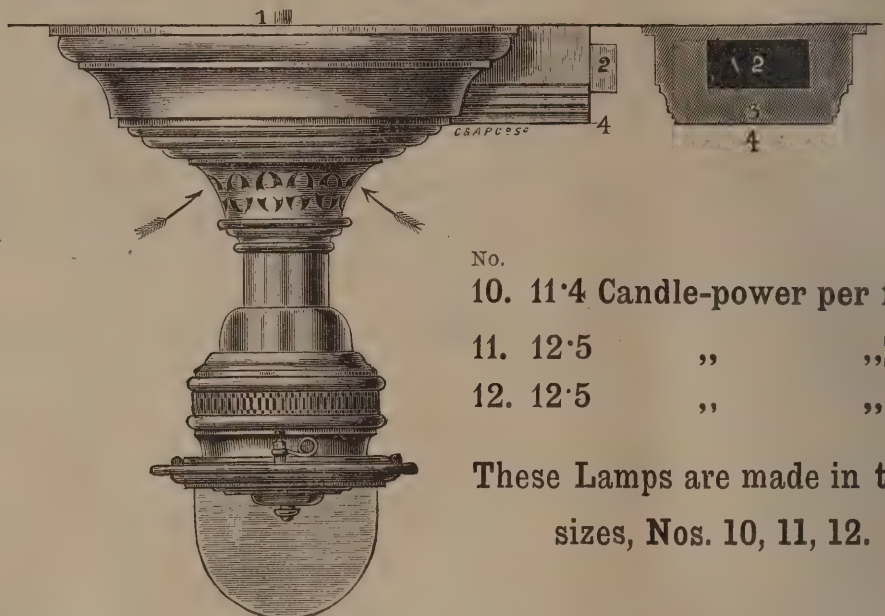
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# The Architect.

## THE WEEK.

THE people of Liverpool can be thankful that an influential section of the City Council has negotiated successfully with Sir FREDERICK LEIGHTON for the purchase of his *Captive Andromache*. The President has met the Council in the most generous way. He receives only part payment at present out of the money obtained through the admission fees to the exhibitions, and the remainder will not have to be paid until it is obtained in the same way. The people will thus be enriched by a noble work of art without any cost to them. The picture is well adapted for a public gallery, for students of art can derive invaluable lessons from it. Judging by the remarks in the Council Chamber about the transaction, it is to be feared that some time will have to elapse before the community in general will be able to appreciate the work.

A QUESTION which is now being asked among French architects is why M. EDOUARD CORROYER has been removed from his office of architect at Mont Saint-Michel? Can it be that the officials propose further degradations to the ancient buildings, in which M. CORROYER declines to have any share? The only certainty is that he no longer has charge of Mont Saint-Michel. At the next sitting of the Commission of Historic Monuments his successor will be nominated, for the approval of the Minister. For several years back M. CORROYER has devoted himself to the care of the sea-washed towers, the "Marvel" cloisters, Church, Chamber of the Knights, and other remnants of the age of chivalry, and from the association of the place with English history, he has a claim on the gratitude of Englishmen for his efforts to resist the ruin of the buildings.

AT a meeting of the Council of the Institute of Chartered Accountants in England and Wales, held on Tuesday last, the designs for the erection of a hall and offices, submitted by six architects who had been invited to compete, were considered, with the assistance of Mr. ALFRED WATERHOUSE, R.A., who kindly acted as assessor. The plans forwarded by Mr. JOHN BELCHER, F.R.I.B.A., of 5 Adelaide Place, London Bridge, were unanimously adopted, and Mr. BELCHER was appointed the architect to erect the proposed building. The plans can be seen to-day and to-morrow at 3 Copthall Buildings, E.C. (first floor).

THE Glasgow City Council have decided to take down the Exhibition buildings with the exception of the Fine Art Galleries, which are to be used as a sort of refuge for works which cannot be exhibited in the Galleries in Sauchiehall Street. Some of the members of the Council wished to preserve the buildings in their entirety, but it was difficult to discover any use for them, and in the second place a large sum would need to be expended in order to make them watertight. The construction was not intended to be tested by the rain and storms of the North.

THE rivalry between the Corporation of Leeds and a temporary committee of the inhabitants for the acquirement of the grounds and ruins of Kirkstall Abbey could hardly fail to be without its effect upon the owners of the property. At one time a sum of five thousand pounds could have secured that part of the Cardigan Estates, but after the controversy on the subject, the value has been increased to double the sum. At the sale on Wednesday a reserve price of 10,000*l.* was fixed upon the Kirkstall lot, and the highest bid by the town clerk of Leeds, on the part of the Corporation, was 6,100*l.* If, by any mishap the grounds should be diverted from public use, the Corporation will have to bear the blame. If instead of shilly-shallying over the proposals for purchase, the Corporation had decided to buy, or to abstain from buying, there would be no difficulty now. But no decision was arrived at until a committee was formed in the town, and then a member of

the corporation tried to cut out the newcomers. The trustees of the property utilised the opportunity in the way we have explained, and eventually the people of Leeds will probably have to pay 12,000*l.* to obtain what remains of Kirkstall Abbey.

ALTHOUGH the French people are supposed to take an interest in all forms of art, there is very little concerning architecture to be found in their journals, especially when compared with the articles on painting and sculpture. The Société Centrale des Architectes has tried to bring about a more ample appreciation of the art by instituting a series of conferences, in which art-critics and other writers will take a part. The hall of the Ecole des Beaux-Arts has been lent for the meetings. The first discourse was delivered on Thursday in last week by M. ROGER-BALLU (who is, we understand, a son of the late THEODORE BALLU, the architect of the Hôtel de Ville), on "Contemporary Criticism and Architecture."

WHEN Temple Bar was taken down great care was taken in numbering the stones to correspond with a plan which had been prepared in the city architect's office. But, according to Mr. C. E. PONTING, F.S.A., who had charge of the reconstruction, all the trouble thus taken, however, was rendered futile in consequence of the perishable nature of the medium—probably watercolour—which was used for marking the stones. In the result only two or three out of the entire number had any trace of it left on them after having lain on the ground and been exposed to the weather for ten years. Mr. PONTING says that, with the aid of a staff consisting of a builder, a foreman, a clerk of works, a sculptor, and a band of workmen, he was able to put all the stones which had not perished, and they weighed four hundred tons, in their right places at Theobald's Park.

MR. F. B. BARWELL, the artist who is one of the inspectors of the Science and Art Department, has appealed to his fellow-citizens of Norwich about the state of their art school. Evidently the people take care that they will do nothing to promote the appearance of successors to the CROMES and COTMANS. The art school is at the top of a building, and is too limited in area. The committee have no money to pay for the erection of a better building. Science is in a corresponding condition with art. Mr. BARWELL points out the advantages which are available elsewhere in England, and he pertinently asked the citizens:—"Are you going to confine your youth to the birthplace? Are they not to seek employment elsewhere, and so lighten some of your burdens and responsibilities? Is no fresh industry ever to arise in Norwich? And are not your people likely to be supplanted by the better instructed from other places?" A better argument is found in the statement that the large sums distributed by the Science and Art Department cannot be claimed in Norwich. Finally Mr. BARWELL begs of the people to insist on their representatives in the Town Council, the trustees of their various charities, and other bodies who may have a voice in the matter to throw aside their party or sectarian differences, and work together for a great and salutary object, to confer upon the population at large those permanent and well-proved benefits that the hard-headed people of the North have long ago embraced as essential to their prosperity.

THE French canal system will be greatly changed if the invention of M. MAURICE LEVY of the Institut can be utilised to the extent which is proposed. It consists in the haulage of the barges by endless wire cables, which are to be fixed on both banks of a canal. The barges will be attached to the cables by an apparatus which can be as readily removed. A speed of only two and a half English miles an hour is contemplated, and at that rate the injury to the banks of a canal must be very slight. The cost will be much cheaper than when horses are used. By order of the Council of Ministers an experiment has been tried near Jonville with satisfactory results. M. LEVY does not propose to make any profit out of his scheme, and offers it as a gift to France.



## PROVENCE AND THE RIVIERA.\*

THE fine illustrations of Nîmes and Arles by Mr. NEEDHAM WILSON, in the Architectural Illustration Society's series, may have revealed to many the richness of the south-eastern part of France in Classic remains. Some pictures by Mr. CALDERON have also suggested that the painter will in that part of France find models no less attractive than those of Capri. But, as a rule, strangers do not care much for exploring the country which lies on both sides of the lower reaches of the Rhone. Parisians regard the inhabitants as belonging to a different race, and of late have supposed that the eccentricities of the novelist M. TARTARINI are common to all the descendants of the Provençaux, if not to the whole of the people of the Midi.

A glance at the map will show the accessibility of the south of France to all who could sail along the Mediterranean. Greeks and Romans gained a footing there. It was a colony of Phœnicians who founded Marseilles, and their descendants opened the way to the Romans for the conquest of Gaul. If the Greeks have not left many signs of their architectural skill in France, it is otherwise with the Romans. Looking at the great works which remain, we might imagine that architecture was employed as a means towards the civilisation of the Gauls and the bringing them peaceably under the dominion of the invaders. What other reason can explain the existence of a theatre in Orange which could accommodate at least 7,000 spectators? At Arles was another, and the *Venus* in the Louvre, which was dug up on the site, will by itself suggest the magnificence of the two buildings. Then there were amphitheatres which were still larger in area; one in Nîmes could seat 20,000 spectators. If we suppose that the Roman provinces also contained temples and public buildings which were no less grand than the places for spectacles, we must admire the greatness of a race who tried to conquer barbarism by arts as well as by arms.

It was the good fortune of the district to be endowed with all that art could do at a later time. MACAULAY's schoolboy must remember what the historian wrote about the condition of Provence in the twelfth century. That country, he tells us, was the most flourishing and civilised part of Europe; each of the cities was a little republic, each of the castles was a miniature of the imperial court. There the spirit of chivalry first appeared, as the inseparable associate of art and literature. It is maintained by some French archæologists that Byzantine artists worked in France. If Greeks could find a market for Eastern tapestries in Narbonne and Toulouse, and meet with disciples who were eager to be indoctrinated in mysterious Eastern theories, may we not also suppose that Eastern ideas about architecture and ornamentation spread through Provence, and affected the styles of the architects? One thing is certain, that if we are in search of examples of pure Gothic, there is no use in going to the South for examples of it. But the buildings would be less characteristic if they were marked by more unity of style. All sorts of traditions seem to meet in them, and in cases where unity and severity are sought, they appear to be intended as a corrective of the opposite qualities. There was always more or less independence in that part of France, for it should be remembered that the oldest writer who describes the Albigenes of Provence—GUILLAUME DE PUY LAURENS—admits that they were not all of the same belief about LUCIFER's relation to this world, which they supposed was his creation. Crusades and inquisitions may have had the effect of subduing the people's independence in one way, but it is evident that no force could induce the artists to mould their work entirely on northern models.

It is the interesting district of south-eastern France that forms the subject of Mr. MACGIBBON's book, "The Architecture of Provence and the Riviera." In arranging it he follows topography, that is, he describes the towns in succession as he passed through them. But, unlike the writers of most tourist's books, he divides the descriptions into two parts. Mr. MACGIBBON recognises that in the district there are examples of two distinct styles. He first notices the Classic buildings of the district, and afterwards

those which may be called Gothic. For a student of architecture this arrangement is serviceable, as he is enabled to compare illustrations of a style with more satisfaction than if the two were mixed together. Mr. MACGIBBON commences with Vienne, near Lyons. It is a long way from the coast, but it suggests the extent of the Roman works. Very little is added to the information which "Murray's Guide" furnished long ago, about the temple and the Forum in the town and "the Needle" outside. Indeed, Mr. MACGIBBON would have made a better book if he trusted everywhere to his own observation. But the illustrations are suggestive. The next town is Orange, which bears evidence of Roman occupation in the theatre, with its mighty proscenium, and the triumphal arch. The proscenium is not only a solitary survival, but it differs from those which are introduced in representations of the Roman theatres. The wall is 335 feet long, 112 feet high, and 13 feet thick. Behind it are enclosures, which may have formed dressing-rooms, but a century ago they were used as prison cells. What is most remarkable is the shallowness of the space which was reserved for the performers. If we assume the clear opening to be about 220 feet, the depth could hardly exceed in any place 40 feet. There was accordingly a great limitation in means to produce effect, but on the other hand spectators had always a splendid piece of architecture adorned with sculpture before their eyes instead of painted canvas.

As it is not narrated in "Murray," Mr. MACGIBBON does not appear to be acquainted with the history of the restoration of the triumphal arch, which is interesting for several reasons. In the thirteenth century a donjon was erected upon the Roman arch by RAYMOND DE BAUX, and it was allowed to remain until 1721. After it was demolished the stones were cast in a heap beside the arch, for which they served as a sort of buttress. The arch needed support of that kind. Occasionally something was done to keep the masonry together, and a timber roof was placed over the structure, but the repairs were entrusted to the masons and carpenters of the district. In the beginning of the present century the arch was in imminent danger of falling, owing to the removal of the stones which belonged to the donjon. But no steps were taken for the preservation of the arch until 1825, when M. CARISTIE, the architect, was sent from Paris to restore it. His first endeavour was to make the structure solid, and next to conserve everything ancient that could be utilised. He found it necessary to remove masonry, but he took care that what was substituted should never deceive a spectator. Mr. RUSKIN speaks admiringly of the sketchy character of the reliefs, but it was the aim of M. CARISTIE to impart to all the new work "un caractère d'ébauche," in order that any chance of confounding modern with ancient work might be obviated. The architect was able to find the quarry of Baumes-de-Transit, from whence the original builders drew the stone for the arch; but, although it offered a temptation to imitate the detail that was removed, M. CARISTIE practised no deception. In cornices he avoided mouldings, and where a part of a column is restored he omitted the fluting.

When the arch was erected and for what purpose are not revealed. M. CARISTIE came to the conclusion that the Arch of Orange, with others in the district, especially those at Saint-Remy and Carpentras, were alike in ornamentation and sculpture, and therefore were erected about the same time. He considered they were intended to celebrate the victories of MARCUS AURELIUS. His opinion was adopted by PROSPER MERIMÉE, on whom Mr. MACGIBBON depends. We hope, in his next edition, he will recognise that any credit which comes from the theory belongs to M. CARISTIE. Another theory, which M. LENORMANT worked out with great skill, is that the arch was erected to commemorate victories over JULIUS SACROVIR, the Gaulish chief, who was defeated near Autun. There is the word "Sacrovir" still surviving on one of the trophies as evidence to support it, and that is almost enough to give rise to a theory, but the general design of the Orange arch is supposed to be of a period at least a century later than the defeat of SACROVIR, which occurred in A.D. 21.

MERIMÉE was also indebted to M. CARISTIE for the information which Mr. MACGIBBON retails about the construction of the upper part of the theatre at Orange, and other details which would not strike an amateur. One can hardly

\* *Architecture of Provence and the Riviera.* By David Macgibbon. Edinburgh: David Douglas.



fancy the author of "Colomba" climbing ladders 112 feet high in order to discover what kind of covering was employed. MERIMÉE was a most useful director of the Historic Monuments Commission, but it is time to cease taking him at his own estimation as an archaeologist.

Arles has still two storeys around the enclosure of its amphitheatre, and the benches are in part preserved. The theatre, which, if not so large, was a finer piece of architecture, has to be judged by a couple of columns. At Nîmes the amphitheatre can be also used. The corridors are roofed by massive lintels of stone, which in many cases are cracked, and the cause is generally supposed to be an earthquake or a conflagration. Mr. MACGIBBON ascribes the cracking to the vicious form of construction, which could not sustain the superincumbent weight. In describing the Maison Carrée, he adheres to stereotyped statements about irregularities, and it is satisfactory to find that the author has the courage to say that, "Notwithstanding these defects, the Maison Carrée is a building of which Nîmes and France may be proud;" words which will, we suppose, persuade Frenchmen to keep the building from destruction.

In treating of Christian architecture, Mr. MACGIBBON substitutes for the statements in "Murray" a theory which is due to Professor BALDWIN BROWN, and derived from DE ROSSI. According to it, the model of the early Christian church was "the scholæ or halls of meeting of private societies." With the aid of the light afforded by this supposition, the course of church architecture is traced through Roman and Byzantine times. The influence of Venetian traders is introduced as a factor in French architecture, and it is suggested that St. Front Perigueux was borrowed from St. Mark's but constructed by a native artist. The following extract will suggest Mr. MACGIBBON's argument about the peculiarities of the buildings in Provence, and also how well the author can state a case when he trusts to himself:—

At a distance from Perigueux, as a centre, domes are sometimes used, as is the case, for instance, in Auvergne; but in Provence the dome is generally limited to the space over the crossing. In the latter locality the Byzantine influence exhibits itself in a different direction, being chiefly confined to details and subordinate features. But here another factor comes into play. The presence of the Roman monuments still existing in Provence has evidently tended to impress a Roman character on the architecture of the district. So strikingly indeed does some of the Provençal architecture resemble Roman work, both in general design and in detail, that it has frequently been maintained that it is actually the work of the Lower Empire. The style of Provence in the twelfth century differs on this account considerably from that of the other Romanesque styles. The revival which took place all over Europe in the eleventh and twelfth centuries occurred in Florence also, but the result there was somewhat peculiar, the effect of the Roman remains being to produce in many of the features of Provençal architecture a closer resemblance to the Romanesque style of Rome and Italy than to that of the Rhineland and the North. The towers and campaniles of Provence also either correspond in design with those of Italy or are imitated from Roman monuments in the country. The circular baptisteries, of which a good many examples survive, are, like those in Rome, constructed with columns and caps from ancient buildings, or are wrought in imitation of them. Sculpture also abounds in Provence, being inspired by the abundant remains of ancient work in the favoured provinces of the Empire.

(To be continued.)

## ARCHITECTURE AT THE ART CONGRESS.

MR. BASIL CHAMPNEYS read a paper entitled "Style." The development of style had, he said, been gradual and harmonious, and its practice had been the result neither of theory nor argument. But in the present day the architect found himself unaided by any prevailing taste or tendency. The best means of remedying this state of things and for bringing architects generally to some common aim would be to arrive at certain wholesome limitations. He advocated architects limiting as far as possible their study to English work, which must necessarily have more fascination for Englishmen than foreign work, and which was certainly as good if not as magnificent as anything to be found on the Continent. In all cases they should prefer purity of style to mere extravagance, and never consciously aim at originality.

### Obstacles to Progress.

Mr. T. G. Jackson read a paper on the subject of "Obstacles Opposed to the Progress of Architecture by Architects Themselves." He said that, considering the importance of good architecture, it was astonishing to find

such general indifference among the public. The remedy was in the hands of the architects themselves, who were by no means working in such a way as to put their best before the public. Like other works of art, architecture was only good so long as it bore the stamp of the artist's personality, and the only architect deserving that name was the man who attended to the smallest detail of his design and work. Unfortunately nine-tenths of our buildings were not so attended to. The majority of those who were themselves architects gave the greater part of their time to work more properly belonging to the surveyor, the lawyer, or to the commission agent, and only the leavings of their time to architecture. Their own actual work was accomplished with the aid of "ghosts." The architects should most certainly stick to their own craft, because they would find in it more than enough to occupy all their time and energies, and because unless they devoted themselves to it entirely they would never hope to do good work.

### Coloured Decoration of Churches.

Mr. E. Prioleau Warren in his paper pointed out the backwardness in decorative art of the ecclesiastical branch as compared with the civil and domestic, and said that in the decorative school of the fifteenth century, the work of which was exemplified in many of our churches, they had ample suggestions for modern use. A protest was entered by the speaker against the neglect of the use of colour in churches, and the impression prevalent among architects that the decoration of churches was a matter beyond their scope, and therefore to be relegated to specialists. He expressed the opinion that architects should carefully study colour effects, should design their buildings with the view of receiving the colours, and should be their own decorators.

### Architecture and Liberal Education.

Professor Roger Smith explained the gradually-increasing scope and aims of modern education and culture, and said that, as they had come to the study of art, they should certainly include in an art education the study of architecture. Education contemplated general training and cultivation, together with specific preparation for after life, and if from art they omitted architecture one-third of the subject disappeared. Architecture could perhaps better supply the kind of training required than any other of the fine arts. It more than any other art rested on abstract principles. It was closely allied to science; it was historic; it fitted a traveller for understanding what he saw, and it added a new interest to archaeological studies, &c. There were few things which would better aid a man in fitting himself for public life than a proper and careful study of architecture.

### Nature of Architectural Ornament.

Mr. H. H. Statham afterwards read a paper explaining that all natural ornaments when used in architecture required to be conventionalised or treated in a special way. There were, he said, ample resources in nature for decorative purposes, and there were many forms in nature which had never been used, although they might well be so treated. He did not make this assertion without proving that he was correct in what he said, and for this reason he had come prepared to illustrate his paper with lithographic sketches and examples of casts.

### The Outcome of the Congress.

Mr. H. Sumners in his paper said that there could be no doubt as to the wonderfully elevating and beneficial effect that the words and work of the congress was certain to leave behind, and which would permeate not only the city of Liverpool, but the nation at large. Throughout all they must have been impressed with the singular unanimity of opinion upon the great want of appreciation and encouragement of art, and with the great divergence of opinion as to the correct mode of educating those by whose handicrafts the designs of the masters in art were carried into execution. It must be admitted that there was in our midst, and in the ranks of the artisans, capability to do good work; and one powerful means of getting good work was to give the artisan an incentive to work and to make him less of a machine. A very desirable result of that congress—in fact, the one great result to be desired—was the establishment and encouragement of trades technical schools. In Liverpool there were no such schools, although they had science and art classes, Government schools of art, and classes at University College, at which, however, he was afraid, few artisans attended. He believed that the several trades organisations were grasping the situation, and were about to encourage the formation of, and fill with pupils, technical schools of their own, so as to entitle themselves to a share of the grants from the public funds set apart for that purpose. This school or institute was to offer to the artisans and apprentices to a trade an opportunity of studying the branches of education particularly bearing upon their respective trades. With this object in view, a provisional committee had already entered into communication with the



Government Science and Art Department and the City and Guilds of London Institute. It was necessary that local pecuniary aid should be given to push on the scheme in order to obtain these grants, and for the obtaining of this assistance an appeal was shortly to be made to the city council and to others interested in the movement. With such a school the younger artisans would gain in their youth the life-long acquirements and dexterous modes of skill attained by the elder handicraftsmen, and thus the nation would benefit. Thus they would proceed until they arrived at a state of working that might in interest and organisation become a "trades guild," in which the members from apprenticeship upward would be necessarily instructed and made efficient in their particular crafts. It would follow that there would be no "duffers" or "drones" earning under false pretences the wages of the true handicraftsman. The organised trades of Liverpool were determined to form such a school, and they believed that there were gentlemen of position, means, and influence who would take this great measure to heart, and come to their aid in a liberal and generous manner.

### SCULPTURE AT THE ART CONGRESS.

A PAPER was read by Mr. W. Emerson on "The Decoration of Public Places and Buildings." He remarked that in England our public works did not tell any tale of our religious, historical, or domestic lives, unless perhaps it be, by the conspicuous absence of sculptured history, that the nation as a rule was so given up to trade, commerce, and money getting that there was interest for little else besides. The provincial towns, though Liverpool had some sculpture in connection with its St. George's Hall, were equally with the metropolis deficient in historical incident represented by figure subjects. Why, he asked, was this marked absence of illustrative sculpture in connection with our national buildings? Had England no history to be proud of, no foreign relationships, no India, no Colonies? Had we no wars by sea or land, no interest of peace, no State trials, no scientific discoveries, no trades or specialties of commerce, no amusements or pursuits in our domestic life, and no literary works worth illustrating? And, lastly, had we so little religion that we were ashamed to render in stone, marble, or metal subjects illustrative of our belief? In all countries and times religion had been the foster-mother of sculpture in connection with architecture; political power and wealth its nurses. He urged upon the State the duty of insisting that our public buildings and places should be more instructive in their character; or what use was it, he asked, to institute academies and schools of art all over the country, and to encourage men to turn their attention in the direction of art, and to educate numerous art workmen, if there was to be no outlet for their future efforts and abilities?

Mr. Bruce Joy alluded to the sculptural work of St. George's Hall. He remarked that Mr. Sterling Lee's panels were most beautiful work, and a real adornment not only to the hall but to Liverpool. That, he added, was the unanimous verdict of all who had seen the work.

Mr. Tarver said we should have more sculpture in England when we could enjoy it sympathetically and saw people of our own time represented—and the people of our own time would be represented when our costume was representable. He hoped to see our costume so modified as to be sculptural, and for that they must look to the great people, such as the Prince of Wales, to set the fashion.

#### Influence of Sculpture on Painting.

A paper was read by Mr. J. B. Gibbs with the object of showing that painting, in all its branches, was perhaps more influenced by sculpture than any other of the fine arts. He deduced examples of this fact from the histories of the famous painters of the Roman, Florentine, Venetian, and Spanish schools. In the paintings of the Dutch and Flemish schools this influence of the antique sculptures was not seen to any great degree, and with regard to the painters of France the influence was varied and uncertain. As to the painters of our own country, it was well-known that the antique had been studied and its spirit absorbed by great artists who had passed away and by many who were at present in existence. Landscape perhaps was the art of this country which was least influenced by any study of the figure; that was to say, that many landscape-artists had not considered it necessary to draw from the antique and nude until within the last few years. But the value of the principles by which the work of the ancients was produced was just as great to the art of landscape-painting as to that of the figure. To work after the manner of the great masters of the past ages—to work in the spirit which was the very soul of great and high-minded sculpture—was not to copy the outward forms of the antique, make men like statues, paint only classical subjects, but was rather to express correctly in painting the character to be represented, and this in a firm,

intelligent manner, taking care to avoid introducing detail which would draw away the attention of the beholder and lead him to praise the artist's mechanical dexterity, instead of the way in which the intellectual part of the work had been accomplished. To give full effect to this intention a thorough knowledge of drawing and colouring was necessary, and it was to be obtained by careful training and drawing from the antique and life. He would be very glad to see in our schools of art casts of modern sculptures, for by that means the interest in modern sculpture would be increased among the numerous art students, and would spread to the world outside. It would also induce a more healthy critical spirit, while the presence of such works by living artists would act as an incentive in the struggle towards the nobler spheres of every kind of art. He wished that all the Dutch painters had struggled to represent in their works the ideal which was expressed in the antique.

The President entered his protest against the tendency to put everything that was bad down to the Academy. He had no more generosity shown him anywhere than in the Academy School. They were not taught to do any special thing there; they were directed.

#### Architectural Carving.

Mr. Samuel Fry discussed the conditions desirable for the carver and the nature of his work. The carver's aim must be subordinate to the design of the building of which he had to emphasise and beautify the chief features. In the useful arts—of which architecture stood at the head—there should be economy of material and grace of form, a blending of construction and beauty, that the result might be a beautiful economical structure. In some useful arts the scientific element could less readily give way than in others to the spurious artistic. But in dressing, he asked, what could be more execrable than disfiguring and injuring themselves for the sake of fashion? A little more utility here would produce more comfort, and turn ugliness to beauty. Unless the æsthetic and practical were both fully represented in useful art it was no true art.

#### Art Metalwork.

Professor W. C. Roberts-Austen, F.R.S., read a paper "On Certain Applications of Gold and Silver in Art Metalwork." The paper was written at the request of the President with a view to indicate certain directions in which the precious metals might be used in art metalwork; the subject being treated from the purely metallurgical and technical side, and pleaded for the widely extended application of coloured metals and alloys in art.

#### Enlarging the Field of Sculpture.

Mr. Alfred Gilbert, A.R.A., in his presidential address, said he was convinced that the time had come for sculptors to devote their efforts to the service of the art in a broader and more liberal spirit than had heretofore been in vogue. This duty was imposed upon them by the increasing demand for their co-operation of the great architectural revival now making itself so evident in our new streets and dwellings. Formerly artists lived to work; to-day they worked to live. One lesson we learned from the work of the past age was that not one of the beautiful works belonging to it had been created without a purpose, and in every case the purpose had been one of use as well as beauty. The ready market for Japanese curios and all sorts of objects *de vertu* should be sufficient encouragement for the production of such wares. The introduction into our modern houses of all the luxuries in the way of ornamentation—ornamental ceilings, coloured tiles, carved wood, metal fittings, and a host of other artistic luxuries—offered an enormous scope that should be sufficient to warrant more special attention and study in the direction of meeting those requirements. But he was bound to admit that the encouragement to seize these suggestions was small at present, as the majority of the rich public were in the condition of being obliged to purchase taste as well as wares through the medium of the professional middleman. He hoped the congress would have a beneficial effect, if it did no more than bring about a frequent intercourse and exchange of opinion between artists themselves, and between them and the outside world. Mr. Gilbert afterwards referred, with emotion, to the case of Mr. Sterling Lee, the sculptor who was employed to decorate the panels outside St. George's Hall. He said it was eminently unfair that the artist—to whom this work of providing a series of panels for the decoration of the hall was entrusted after fair competition by a committee who knew what they were about—should not only be denied the right to complete his scheme and express his meaning to the end, but have to bear the double humiliation of seeing his work unfinished and his powers questioned. He (Mr. Gilbert) was not there to crave their pity, but their sympathy, and to ask them to extend that generosity and liberality they had shown to the artists present to an absent brother artist, who—it pained him to say it—was too broken and discouraged, even were he not, like a true artist, too proud to beg for himself. It was not for him (Mr. Gilbert) to vouch-



safe his personal opinion, unasked, of the work, although no doubt a fairly clear idea of what it was would have struck them; but he asked that a committee of competent artists, composed of sculptors, painters, and architects, be formed, before it was too late, to settle this painful question, and the good name which Liverpool this week had justly earned by inaugurating a movement like this should no longer be so stained as to qualify its right to the distinction.

Mr. Damer Harrison asked the chairman whether it was not competent for that meeting to pass a recommendation to the municipality of Liverpool with regard to Mr. Sterling Lee's work. After the powerful appeal made by Mr. Gilbert, he did not think they ought to leave that room until some practical effect had been given to Mr. Gilbert's suggestion. He moved the following resolution:—"That this meeting recommend to the consideration of the Liverpool City Council the appointment of a committee, constituted of sculptors, painters, and architects, to determine upon the merits of the work and designs of Mr. Sterling Lee for the decoration of St. George's Hall, and to advise the Council upon the matter, so that justice may be done."

Mr. George Clausen seconded the motion, which was carried with one dissentient.

### APPLIED ART AT THE ART CONGRESS.

THE subject of Mr. Walter Crane's presidential address was "The Advancement of Art and its Application to Industry." He said they were met to further the advancement of art in its application to industry, but were they sure they did not mean the advancement of industry by the application of art? For centuries past everything had been done to forward profit-making, and the result was that art could hardly find a place for the sole of her foot. Mechanical invention in the interests of trade had dominated us, and mechanical invention had outstripped the invention of the artist. Mechanical smoothness had taken the place of artistic thought and finish, simply because the amount of output was more regarded than the artistic quality of the material and work. The whole structure of applied art was built upon the shifting sands of insincerity and speculation. Art and industry should be inseparable, but the spirit of industry was merely to produce, that of the artist to express also. Commerce, like the old woman in the nursery tale, stood at the stile of an overstocked market with her obdurate pig, over-production, which refused to move until the stick of new demand had been brought to use its influence; and so all the characters of the commercial drama acted and reacted, even so far as the ox—possibly John Bull—driven to action by the goad of the butcher, the Nemesis of foreign competition. Meanwhile the fluctuating harlequin of fashion and trade came and went; this year we were going in for being artistic—everything was to be artistic—art colours, art furniture, art in the attic, and art in the coalhole. Next year, away with your degraded colours! Let us be grandly barbaric in mauve and magenta! And so art and industry remained an ill-assorted couple, furnishing an additional modern instance to point the moral of those who asked "Is marriage a failure?" To those who delighted in personal work and characteristic, the employment of steam as a means of reproducing art was a mistake. The system of production was not economically organised in the interests of the community, but rather for the profit of individuals. In handing art, as a commodity, over to the insensate machinery, both its spiritual and sensuous delights vanished, and the refining and educating influence of its practice and its ultimate appeal were lost. The demands of the public were such as to cause the designer to evolve something that was new, and that novelty was taken as its sole and entire merit. Producing art by machinery was like misquoting a poet on a hundred pages and calling it a book. In the means of producing art by machinery we had lost sight of the end in the means. The purely artistic production, the old methods and old tools, remained as they were, for the simple reason that nothing could supersede the hand. That personal touch valued so highly in the fine arts had practically disappeared from the handicrafts, although with the enormous existing power of reproduction it was absolutely important that the designs should be good. In this country the term "artist" had come to mean only the pictorial artist, to whom fortune, fame, and favour were open almost exclusively. This he ascribed to the Royal Academy, which was supposed to foster the arts, but really fostered the one art only. Every man who had risen in the art world had really done so against the influence of the Academy; but directly he entered the charmed circle his individuality was swallowed up. The fact that local exhibitions were under the influence of the Academy also contributed to the present condition of art. Many of the art schools were rendered useless by the desire of the managers to pass as many students as possible through a certain number of standards. If we really had the honest desire to unite art with

industry, they should see that the craftsman had personally the credit of his work as well as the responsibility. Art industry seemed to be the Cinderella of the arts. They must endeavour to turn craftsmen into artists and artists into craftsmen, for that was the problem before them. Exhibitions of arts and crafts were very useful in forwarding the work, as were also the guilds of arts and crafts. But do not let them deceive themselves, or expect to gather the grapes of artistic or industrial prosperity from economic thorns or æsthetic figs from commercial thistles. Let them each contribute their quota of influence to the tide, and the question would be solved.

Mr. P. H. Rathbone said he must deny the accusation that the Liverpool Art Gallery was under the domination of the Royal Academy. They were most anxious to give any good artist a fair chance, as the walls of the gallery would show.

### Art and its Producers.

Mr. William Morris in his paper offered the following proposition:—"Whereas labour is usually assumed to be the necessity of earning a livelihood; and whereas, in their modern society, this was really the only incentive amongst those of the working classes who produce wares of which some form of art was supposed to form a part, it was impossible that men working in this manner could produce genuine works of art, therefore it was desirable either that all pretence to art should be abandoned altogether, and that arts should be restricted to matters which have no other function to perform except their existence as works of art, or else that to the incentive of necessity to labour could be added the incentive of pleasure and interest in the work." Should they, he asked, pretend to produce architecture and the architectural arts without having the reality of them? Should they give them up in carelessness or despair of having the real, or should they set themselves to have a reality? He was in favour of adopting the third course, and he urged it upon his hearers. He addressed himself to showing that the architectural or ornamental arts formed an integral part of the consciousness of manly life. This was his theory under which genuine architectural arts could be produced, and it was founded on the view of a historical development of that industry. The present system of production, he argued, had turned a handicraftsman into a machine; and he urged that the system of production must be changed; machines should be made their slaves and not their masters, and the whole system of society should be recast.

### Municipal Art Section.

Mr. Edwin Seward read a paper on "The Development of Local Influences for the Advancement of Art." He advocated the formation of a purely working artisans' section, connected in some way with the grant system of the Science and Art Department, and the establishment of some sort of scheme for recreative education, which the department might step in to aid later on. In helping that kind of work, local art associations could accomplish much, and where possible, ought to be of two kinds, one for amateurs and others of that class who already liked art well enough, but who, for want of well-directed influences, were of small use to art itself, and the other consisting of organisations for the training and practice of artisans, both being distinctly in touch and working together in such matters as periodical exhibitions. It would be easy in most towns to bring about the establishment of committees for recreative education in connection with the corporation or the governing body, and by that and other means the artisan and his son or daughter could gradually be led forward towards art, and thus the ground could be prepared for that higher training which art and technical schools, colleges, museums, picture galleries, and art societies could impart.

Mr. P. H. Rathbone, speaking of the love of art among the working classes, said that the difficulties in connection with the art exhibitions in Liverpool had not arisen with the people. It had been the upper middle classes who had chiefly been deficient in their encouragement and appreciation of art, for although they might fill their drawing-rooms with pictures, that was not national art and the people's art.

### A Plea for Decoration.

Mr. W. E. Britten read a paper in which he said that the people would have ornament, be it ever so crude, and artists still hoped to have their Minister of Art who would exercise his influence in taste as to necessities. Artists felt the want of a modern Pericles in the Cabinet to set out on a new artistic campaign, and at the bidding of really capable men undertake large plans and schemes for the adornment of long black and dingy streets in colourless London. The Renaissance of red brick was very welcome. They should seek a royal charter for the support of the Association.

### Things amiss with Art and Industry.

Mr. J. D. Sedding read a paper. He said they were told that machinery was really the cause of the wrong-going of art and industry, that it disturbed the contact and the sympathy



between the manufacturer and the operative. But there was some things much more to blame than the machine, and those were the bad designs of the manufacturer. Our industries were undoubtedly suffering from bad design, bad material, and the miserable life which was lived by the operative. All the art schools, lectures, and even congresses in the world would not avail unless they surrounded the artisan with comfort and some degree of happiness. The only remedy which would meet the case was the application of Christianity in a Christ-like way; but the modern Englishman preferred to work by means of Act of Parliament, and perhaps the Act of Parliament which might remedy the evil might come in a measure for profit-sharing and for giving the workman the interest and profit of his own work.

Professor Aitchison said he did not think art could be promoted by Act of Parliament. They must try and educate the people to a thorough love of art, and when there came a general demand from the people it would be acceded to.

Mr. William Morris said that Mr. Sedding was inclined to deprecate the use of museums in regard to the study of the arts. It was rather a difficult point to decide. He was inclined to agree with much that had been said by Mr. Sedding; at the same time the museums preserved for them the traditions of style and art to a great extent. He desired to protest against the line drawn between the intellectual and the non-intellectual—if there was such a thing—in art. Supposing they wanted to raise a school of decorative art and desired to have workmen who would be able to express their feelings and ideas through the medium of decorative art, they were met by this difficulty, that workmen who expressed themselves in that way were still only workmen, and they would undoubtedly, if they had anything in them, strive to do their utmost for their own material advantage in the world. The result would be that they would rise, if they called it rising, out of the working-man class and become those gentlemen artists of whom he spoke on the previous day. As long as that went on they would be foiled in their endeavours to get a large mass of capable workmanship amongst the people in whom they desired to see it.

Mr. E. R. Russell, who followed, said they all admired Mr. Morris's ideals, but there might be a danger in admiring them that they would lose the practical means which might lead them furthest towards their accomplishment. He shared Mr. Morris's regret that many workmen did art work without rising out of their position as workmen, but on the other hand it was utterly Utopian to suppose that everybody concerned, say on a building, could have an equal degree of artistic feeling in his work, and to this they could never hope to attain. What they might hope for was that each person in his degree might be enabled to secure his rights as a man and as a workman. For instance, a stonemason was entitled by combination with his fellows, and by "striking" if necessary, to secure proper wages and a proper amount of leisure. The artist workmen, on the other hand, had to take similar precautions in order to get their names connected with their work. If that were done they might depend upon it that Messrs. Doulton's workmen, for example, would very soon be raised from the position of mere workmen by the recognition which the public would give to their work.

#### Craft Ideals.

Mr. T. J. Cobden Saunderson read a paper describing the bookbinder's craft. After a description of the conditions under which the craft was at present carried on, Mr. Saunderson spoke of the supreme aim of bookbinding, which he declared to be an art as well as a craft. He said that this supreme aim was an act of homage to the genius of a writer. A binder must be an educated as well as a skilled man, and he should strive to have his binding looked upon as the temple of the great spirit enclosed within it. This declaration as an act of homage was impossible unless the binder himself was a literary man and had been inspired by admiration for the book and its author. If the creation of beauty and strict utilities was made a domestic, a civil, a national and an international object, then every craft and art alike, issuing from the true fountal source directed to great ends, and converging to one result, would have its own significance, would be co-operative, would attract to its practice every variety of talent, would be followed with enthusiasm, and would be its own exceeding great reward. But to effect this the "educated classes" must be educated, and for the gigantic incubus of modern commercialism must be substituted a socially organised method of life having beauty for its aim. The "educated classes" must be made to long for and to work for this transfiguration of industrialism into a "thing of beauty."

#### Fashion and Manufacture.

Mr. Lewis F. Day said it seemed that fashion was dead against art, and he questioned whether they were compelled to follow fashion simply because it was fashion, or whether fashion was for the general good. Even for manufacturing enterprise there could be no more insecure basis. But the

manufacturer really considered himself, not the public, and he sought to create new wants rather than to meet those existing. Purloining patterns was too common, and the only antidote to piracy was honesty, not fashion. Mr. Day deprecated the habit of the artist being kept subservient and unknown, and the benefit of his work being entirely reaped by the manufacturers, who kept him unknown and underpaid.

#### Decoration in Plaster.

Mr. G. T. Robinson, F.S.A., read a paper upon "Sgraffito and other Processes of Decoration in Plaster," the address being supplemented by the exhibition of a number of illustrative specimens.

#### Sculpture, Architecture, and Applied Art.

Mr. John Belcher's paper treated of the necessity for architecture and sculpture being in intimate and affectionate relationship. A certain self-assertion and exclusiveness on the part of sculpture had been prejudicial to her best interests, for when one art not only jealously disregarded but even endeavoured to exclude another, it was to her decided loss, and the effect was injurious to both. On the other hand, architecture had too often given offence by her utter disregard of the functions and requirements of sculpture; for example, by placing figures and groups here, there, and everywhere to fulfil ignominious duties. Both architects and sculptors might meet each other half-way without fear in the development of figure friezes and panels in low relief, and find the field enlarged as public interest and sympathy were aroused. The architect, he said, must lead, indicating clearly the sculptural treatment to which the sculptor was to give expression. The sculptor could give point to a design by concentrating the attention in a dominant motive, and it was by his aid that many effects of grandeur and largeness of scale were obtained.

#### Sculpture in its Relation to Architecture.

Mr. George Simonds, in his paper on this subject, remarked that many of our public buildings were left so unadorned as to give one the impression that they were stopped for want of funds. It was the same with private building, which was usually the work of speculators, who were the curse of art and artists. Such builders spent nothing on adornment that was not of the least costly and most showy order. The present claims of the English to be considered as an artistic people were founded chiefly on the excellence of the pictures which year by year were produced with unwearied energy by an ever-increasing army of painters; for a walk through our cities would convince any one that our efforts in the direction of monumental art were rarely as successful in the present day as they were when England was comparatively a poor country, sparsely populated, frequently convulsed with war, and unblest by the resources of modern civilisation. One great reason was the apathy of the public to all art that was not portable property. Another reason was to be found in the feverish impatience and inconsiderate haste with which modern works were pushed forward to completion. Again, the commercial desire to get the utmost work for the least pay had not a little to do with it; and last, but not least, a serious defect lay in the education of our artists. The Government funds expended in the education of artists were spent not wisely nor too well. There was no need for forcing houses for artists, nor for the creation of a supply where there was no demand. If the nation spent more on the decoration of public places and buildings, and less on the artificial incubation of artists, he thought the result would be that they would have something to show for money so spent, and that the demand for artists would stimulate the supply for a more satisfactory article. He condemned as highly injurious the constant teaching of the doctrine that art was divided into painting, sculpture and architecture, saying that it should be boldly proclaimed that the union of architecture, sculpture and painting alone was art. Divided, they were lovely but helpless branches; united, they formed that noble tree, art itself. If they might judge of the future by the past, they might expect the attainment of the highest results by giving to our artists such an education as they obtained in the fourteenth and fifteenth centuries, before the Government schools of art and other kindred institutions propagated artists, like mushrooms, artificially. The sculptor, the architect, and the painter would each certainly be the better for the broader education he advocated.

#### The Relation of Architecture to its Constituent Arts.

Mr. W. A. S. Benson in his paper maintained that the position of the modern architect was in some respects analogous to that of a conductor of an orchestra or the stage manager of a theatre; he did not execute the work, but he directed and controlled the actual executants. There were two conceivable extremes between which the ideal as well as any actual practice must lie. At one pole was the theory of the omniscient architect directing absolutely mechanical operations; at the other, the theory of a fortuitous concurrence of equal and harmonious craftsmen. Of course, neither extreme had ever been



practised in its full completeness; but while they were not at present likely to be troubled with any approach to the latter condition, there had run through a majority of the papers read at the congress a note of protest against the approximate towards the despotic pole of architecture which has persisted. The result was seen in the fact that architecture was no longer co-extensive with building, it being a liberal estimate which would credit anything that could be called architecture with one-tenth of the building of the day. The evil was flagrant, and admitted by all who had ever regarded the subject. There were those who proposed to correct the evil by a compulsory examination and registration of architects under an Act of Parliament, no doubt to be followed in logical sequence by a Bill for the compulsory employment of such registered architects in all cases of buildings. This was the autocratic ideal, the use of the strong hand. Whatever this proposal might do for the business of architecture, it would by no means benefit the art. He held it to be the distinctive and abiding function of an architect to determine the order in which the various co-operating arts and crafts were to contribute to the building, and to fix the scale and proportion of the several parts and of the whole. It was no part of the ordinary work of an architect as such to originate new structural forms, or to design anything which he could protect under the patent and registration laws. So far from constituting architects a caste of themselves, he would have them simply the leading members of the combined building crafts. Sculptors would head a goodly fraternity of carvers and modellers of every sort. With regard to painters, he did not think art or artists would be in any way the losers if there were some middle term between the art student and the full-blown painter of cabinet pictures in oil.

Mr. Statham condemned the idea that every building must have ornamentation upon it simply for the sake of the ornament apart from suitability.

Mr. G. H. Garraway said every man seemed to set up for himself and his cashbox. Referring to Government patronage, he said artists should be more independent than to seek such aid.

Mr. Edmund Kirby said he doubted whether the public were so apathetic as Mr. Simonds seemed to think. He thought the public appreciated sculpture more than painting. There was so great a difficulty in getting sculptors to execute architectural sculpture that he had to send to Munich to get his own designs carried out. And he knew many other architects who had to adopt a similar course.

Mr. Simonds said architects expected sculptors, who had spent their lives in learning their profession, to work at the same rate as stone-carvers, who had not so spent their lives.

#### The Teaching of Industrial Art.

Sir Philip Magnus read a paper, in which he said that every art had a technique of its own. In his endeavours to add the beautiful to industrial manufactures the artist was met with the limitations of—(1) the use to which the things were to be put; (2) the materials in which they were made; and (3) the appliances by which they were made. The history of the German industrial schools was then commented upon, and a sketch of the French schools was also given, and the reader stated that almost all the English manufacturers received their designs from these countries. He would advocate the teaching of drawing to all children, and from them the best would be found capable of further artistic education. In spite of all that had been said at the congress, machinery would go on developing; but he would like to know if the artists could tell the manufacturers how their goods were to be made more beautiful and how art was to be more intimately allied. It was by the artistic training of artisans that industrial artists would be made. Trade museums would also be a good means of instruction, but they would never be fully useful until artisans were permitted to visit them at such times as they had leisure to observe and rest to think upon what they saw. The connection between the excellence of French designing in special branches and the general system of art education in France was not difficult to trace. The teaching of drawing in that country was almost universal, and exceptional facilities were afforded to artisans of all crafts to acquire art knowledge and artistic skill by means of trade museums. As a contrast to this, the British art schools were not much utilised by artisans, perhaps because few of them had learned the primary principles of drawing. And many of the schools were very imperfectly supplied with the necessary appliances for good art teaching. In Paris the schools were crowded nightly with artisan students drawing and painting from the living figure, both nude and draped. It was a matter of the greatest importance to determine the best means of obtaining successful designers and artistic craftsmen, for upon the adequate supply of these depended to a great extent our ability to compete on equal terms with our Continental neighbours.

Professor Hele Shaw said the moral to be drawn from Sir Philip's paper was that they must get at every unit of the population, and have some means of selecting the fittest instead

of selecting haphazard the art students. Liverpool was not behindhand in the work of technical education. He alluded to the work of the Home Arts Association, of which Miss Calder was one of the founders; and of the Association for Technical Education. The latter body had a scheme of work. Believing that some manual instruction should be given to children, they had divided the schools of the city into centres, and had arranged for instructing 500 boys each week in fret-saw work and wood-carving. They were also organising assistance for this instruction. Through the aid of trades unions and other organisations, they were arranging that apprentices should be encouraged to do work, and attend special classes, to be called "apprentices' classes," in distinction to amateur classes, and their work would be exhibited in the spring of next year. One feature of the scheme was the instruction of primary teachers. Eighty-three head and assistant masters of public elementary schools had certified their willingness to work after school hours at the Engineering Laboratory. Accommodation had been made there for seventy, and these were now at work; and they in their turn would give manual instruction in the schools. With regard to the boys, he might say there were no fewer than 1,100 applications for instruction in this work. That showed that in Liverpool there was a desire for instruction, and the Association was started to carry on what was essentially a voluntary work.

#### MUNICIPAL SECTION OF THE ART CONGRESS.

A PAPER was read by Professor Baldwin Brown on "Mural Painting." He said that in general estimation it was the cabinet picture that was the typical work of the painter's craft; but if we examined the history of painting we would find this had not been the case. In Italy, the chosen home of the painter's art, the works that were visited were mural works. We ought not to be indifferent to the improvement of our national art from the comparative absence from it of mural painting, nor ought a revival of it to present any great difficulties. A noble example had recently been set in Manchester in the employment of Mr. Ford Madox Brown to fill the panels of the town-hall in that city. The difference between the cabinet picture and the decorative painting on the wall was explained, and it was shown that the painter who turned from the easel to the wall must sacrifice something; yet he was a gainer to a large extent in return. Instead of working as a private artist of a private patron, he would have the sympathy and the applause of the whole community, and his work would be invested with the warmth and common sentiment which attached to national or civic undertakings. He must abandon searching into detail, and must simplify his painting, but he would gain in return in elevation of style. Of this elevation of style the works of the great Italian frescoists were the best example. Further, it must be left to the painter to choose his own subject. Professor Brown suggested that the Science and Art Department should be asked to publish a handbook on the technical process of mural painting, materials for which book were already in existence in blue-books and elsewhere. We also wanted the chemist's aid with reference to the permanence of materials used in wall-painting.

Mr. P. H. Rathbone said that if opportunities were afforded, artists were ready to undertake fresco-painting, and pointed out that it was a humiliating fact that some years ago the London and North-Western Railway Company refused the offer of Mr. G. F. Watts to paint the great hall of their London station, free of charge except for the material. A similar thing happened in the case of Mr. Richmond, who offered, for a sum which would not cover his expenses, to paint the interior of the Liverpool Council Chamber with the design of "Commerce Overcoming Barbarism."

Mr. A. Harris said the chief argument against mural painting was as to its performance, and, therefore, they could not expect municipalities to rush into what seemed a doubtful experience. What was wanted was an inquiry into the technicalities of fresco-painting, and with that object in view he moved, "That this congress approach the Science and Art Department with a view to their consenting to publish a popular handbook on the technical processes of mural painting." The resolution was unanimously carried.

#### Economic Arguments for the Encouragement of the Fine Arts.

Mr. Patrick Geddes, M.A., read a paper, in the course of which he said the congress was really a living voice of art, inasmuch as the papers had dealt not simply with questions of technique and materials, of art education, of increasing the quality and quantity of production—all internal questions—but had treated energetically external questions also. He argued that the claims and place of art had to be determined in no small measure upon purely scientific grounds, those of the supposed dismal science of political economy, and said the



task they had before them was to combine municipal and social life with that of their encouragement of the fine arts in a single movement—that of the new Renaissance, the revival of art and life. From the planning of cities to the magnificence of mural decoration and the modest claims of artisan dwellings, and furniture, and art for schools, these were henceforth the real problems of a reformed political economy, scientific and practical.

Mr. P. H. Rathbone remarked that it was because we had not been good political economists that we were now losing very rapidly our position as a manufacturing nation. It was not by cheapness but by the place we occupied in the artistic world that we could hope to keep our position in the future.

### THE MUSEUM SECTION OF THE ART CONGRESS.

MR. L. CUST presided in this section owing to the absence of Mr. Sidney Colvin. He spoke of an ideal museum, and proposed the creation of a Governmental department entirely set apart to attend to the art education of the people; he would have each of our great art institutions under the management of one man, who was recognised throughout the world as the greatest living authority on the subject over which he had control, and this manager should engage himself in the education of others to occupy similar positions; he would have special attention given in the museums of provincial towns to the collection of objects of local interest, having objects of national interest deposited in the national collection; he would have lectures every evening; he would have the museums open on Sundays, and lectures—with special reference to the wants and requirements of the working classes—given therein on Sunday evenings.

#### Art Museums.

A paper on "The Economical Formation of Art Museums for the People," contributed by Mr. George Wallis, F.S.A., of the South Kensington Museum, was read by Mr. Whitworth Wallis. It was pointed out that only museums with the funds of a Government or wealthy corporation at their back could secure important original objects of art when these were brought up for public competition. The question arose, "Is it absolutely necessary that every object in a museum should be original in order that it may be of educational value to the people?" Mr. Wallis's experience had led him to the conclusion that much might be done for the cultivation of a popular taste in the best and highest forms of art without the expenditure of large sums of money on important original works, and at the present time facilities for procuring reproductions of originals had been largely increased of late years, thanks to the increasing number of museums on the Continent, and by the system of international exchange organised by the Science and Art Department. The vulgar, degrading, and factitious admiration of an object because it had cost a large sum of money, and was said to be valued at a higher price, would be got rid of in such a collection of reproductions, and the æsthetic qualities of art as representative of nature and the genius of bygone ages would have a chance of being recognised and appreciated. Of course that was said on the assumption that the originals represented were themselves works of art, and worthy of being reproduced as examples by the best methods.

#### Elementary Schools and Art Galleries.

Mr. T. C. Horsfall read a paper in which he said that to gain knowledge and love of art, we must in early life see beautiful things; while we see them their beauty must be pointed out to us, and we should have our attention strongly directed to them by learning to draw. These conditions obviously could not be created for workpeople unless elementary schools were supplied with small collections of pictures, and with teachers themselves interested in art; unless school children were also taken sometimes to art galleries and to places where they could see something of the beauty of nature, and unless, further, drawing from beautiful objects be taught in all elementary schools. It was of great importance that children should gain knowledge of nature, of whose beauty and interest the majority of the inhabitants of large towns were quite ignorant.

#### Lessons from France.

Mr. Philip H. Rathbone in his paper insisted that it was necessary that Government should exert itself to enable the people to speak the language of their literature, and the time would come when art would be considered as necessary a branch of education as reading and writing. Paris had understood that, and the consequence was that, although France had passed through a most disastrous war which would probably have ruined London, Paris still claimed the position of leader of civilisation in the world. The course of study carried on at the art schools of Paris consisted of two kinds—those intended to educate painters, sculptors, and architects, and those intended for artisans employed in the decorative arts, masons,

pottery, iron and bronzeworkers, cabinetmakers, house-painters, paper-stainers, weavers, &c. Of the second class some were maintained by the Government and some by the municipality of Paris, but all were free. In Paris also the municipality spent very large sums annually in decorating their public buildings by historical or national pictures, and contrasting that with this country he instanced Liverpool, pointing out that not one penny of the cost of the permanent collection of pictures and statuary, and the building in which they were displayed, did they owe to the Council of Liverpool. The people of Liverpool and the artists had, however, done the work well, for they had pictures to the catalogue value of 22,000*l.* bought out of the profits of the exhibitions. Moreover, they had had hard work to prevent a portion of those being grabbed for other purposes, and had even been refused the  $\frac{1}{2}$ *d.* in the pound necessary to give any proportionate amount of efficiency to that institution, which represented a population of 600,000 inhabitants. In a letter which he had received from Mr. Mundella, he said:—"I am the only Minister who ever obtained a grant in aid of provincial museums, and when I demanded its restoration last week what aid did I get from Liverpool? Roscoe I can always count upon, but 'where are the nine?' Why do you not stir up your local M.P.'s against this degrading economy?" In conclusion, Mr. Rathbone gave a list of the necessary examples of the famous art works which would give a complete means of study of architecture and sculpture suitable for Liverpool.

### BIRMINGHAM ARCHITECTURAL ASSOCIATION.

A MEETING of this Association was held at Queen's College on the 4th inst. It was announced that special prizes were offered to the student members by Mr. Naden (president) and Mr. Doubleday (vice-president) for the best-measured drawings of old buildings, and by Mr. Newton for the best design for a house, the particulars of the competition for which would be issued to members at once. A paper written by Mr. Ponting, F.S.A., of Marlborough, was in his absence read by Mr. H. R. Lloyd. The writer gave a detailed account of Edington Church, Wilts, describing it as the first example of transition from the Decorated to the Perpendicular style, and claiming for its designer, Bishop Edington, the merit of originating the latter style. The paper was illustrated by a number of excellent drawings of the church, and was followed by a short discussion and a hearty vote of thanks to the writer.

### SOCIETY OF ENGINEERS.

THE thirty-fourth annual general meeting of the Society of Engineers was held on Monday. The chair was occupied by Mr. A. T. Walmisley, president. The following gentlemen were elected as the Council and officers for the ensuing year, viz.:—President, Mr. Jonathan R. Baillie; vice-presidents, Mr. Henry Adams, Mr. R. W. Peregrine Birch, and Mr. William Newby Colam; ordinary members of Council, Messrs. Chris. Anderson, James Henry Cunningham, George A. Goodwin, Robert Harris, James William Restler, William Schöneyder, William Andrew Valon, and Joseph William Wilson, jun.; as honorary secretary and treasurer, Mr. Alfred Williams; as honorary auditor, Mr. Alfred Lass (Messrs. Alfred Lass & Co.). The proceedings were terminated by a general vote of thanks to the Council and officers for 1888.

### ILLUSTRATIONS.

TWICKENHAM.

#### ARCHITECTURAL ILLUSTRATION SOCIETY. SECOND SERIES.

NO. 47.—THE CATHEDRAL, NIMES. [A. NEEDHAM WILSON.]

PROPOSED EXTENSION OF GREY STREET AND GRAINGER STREET, NEWCASTLE-ON-TYNE.

THIS design has been prepared for the promoters of the scheme for an extension of Grey and Grainger Streets to St. Thomas's Street, in the Haymarket. The two before-mentioned streets were constructed by the late Mr. RICHARD GRAINGER, of Newcastle, who took so prominent an interest in the architectural development of the city. This extension, of which the drawing shows a sketch view, was no doubt for some time previous to his death contemplated by Mr. GRAINGER. On the completion of this work it may be safely asserted that few towns or cities in the kingdom will present a finer array of buildings or noble streets than Newcastle-on-Tyne.





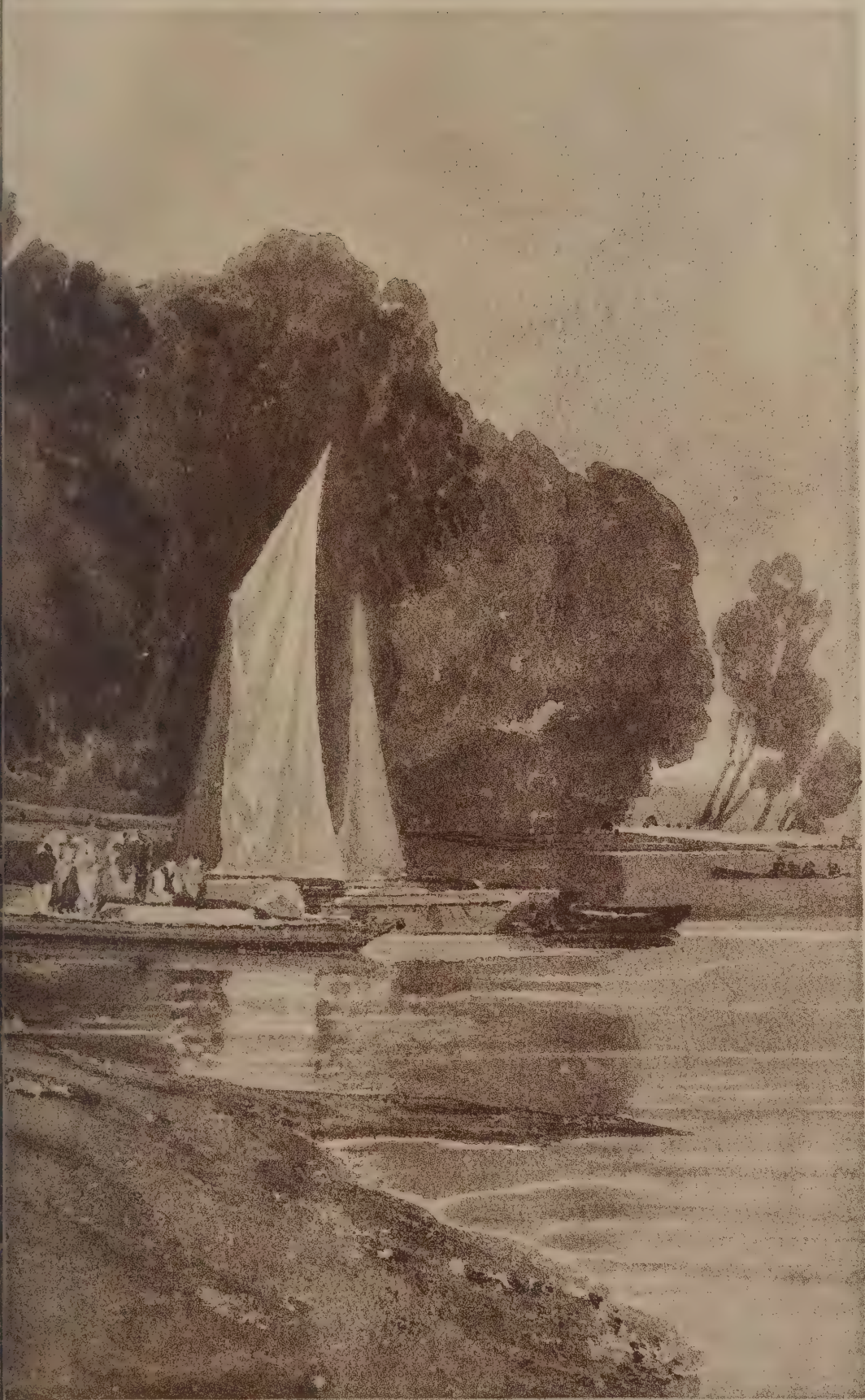




TWICK  
by JOHN  
From the Drawing bel



Decr 14<sup>th</sup> 1888.



"INK-PHOTO" SPRAGUE & CO. 22, MARTINS LANE, CANNON ST, LONDON, E.C.

NHAM.  
L. COTMAN.  
ing to James Reeve Esq











The Architect. Dec<sup>r</sup> 14<sup>th</sup> 1888.

# The Cathedral ~ Nîmes

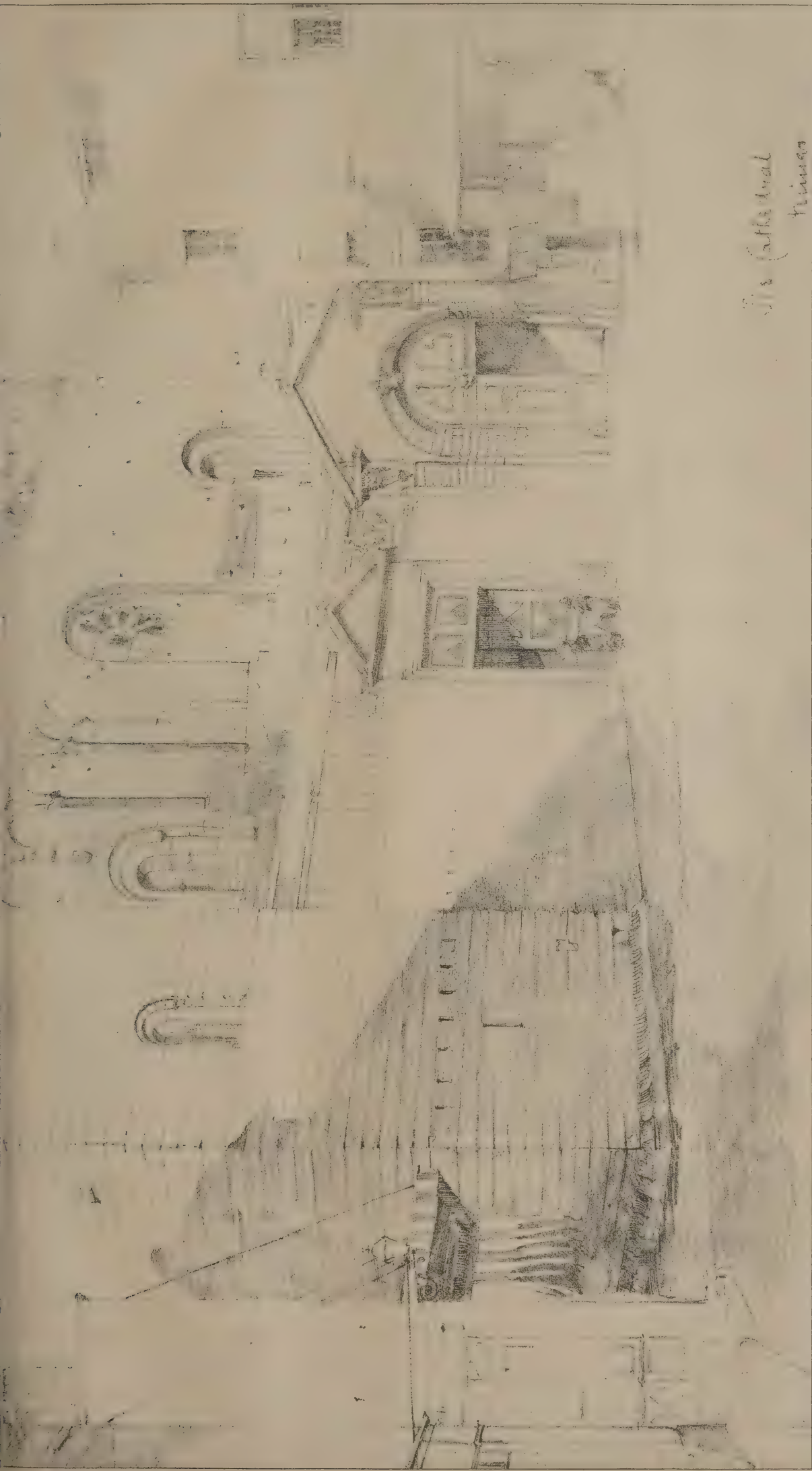
N<sup>o</sup> 11 View

Designed by A. Nodding

1888







*The Cathedral  
Nîmes*

THE PHOTO SPRAGUE BY THE PHOTOGRAPHIC CO. N.Y.

THE CATHEDRAL, NÎMES.  
From a Drawing by A. NEEDHAM WILSON

*See also Plate 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100*













PROPOSED EXTENSION OF GREY ST.  
HENRY MIL



Decr 14<sup>th</sup> 1888.



GRAINGER ST. NEWCASTLE-ON TYNE.

R. A. 1888







## NOTES AND COMMENTS.

THE courses in the Collège de France relating to art and archæology were commenced last week. M. MASPERO will treat of the archæology of Egypt, and M. OPPERT the archæology of Assyria. M. FOUCART takes the course on the antiquities and inscriptions of Greece; and a special course on the Acropolis of Athens will be given by M. HOMOLLE. M. CAGNAT's course will be devoted to subjects relating to the history of Rome. Lastly, M. EUGÈNE GUILLAUME, the sculptor, takes Italian painting at the beginning of the sixteenth century as the subject of his course. It is needless to say that the lectures in the Collège de France—and there are between twenty and thirty professors of the highest standing—are always gratuitous. The college was founded by FRANCIS I. in 1529, and some of the most renowned scholars and men of science are associated with its history.

THE late Professor PALEY was so well known as an editor of Greek and Roman classics, and as in this country we suppose a man can only do one sort of work, it was not surprising that the notices of his life made no mention of his architectural writings. His book on "Mouldings" has not been superseded, but he wrote much more about the art. Professor PALEY was one of the most ardent advocates of the Gothic revival, and he did good work in drawing attention by means of essays and tales to the neglected condition of English churches some forty years ago. His guide to Peterborough Cathedral is still found useful by visitors. Ancient literature was of course his chief task, and as a commentator and editor he upheld the old reputation of this country. Professor PALEY was a brother of Mr. PALEY the architect, who was a partner of EDMUND SHARPE.

FRENCHMEN are becoming alarmed about the danger which awaits the old church of St. Martin de' Monti in Rome. It is not much known to strangers, but it is one of the few churches embellished with landscape-paintings in fresco. The subjects are taken from the history of ELIJAH. Twenty-four landscapes were painted by GASPARD DUGHET, who assumed the name of POUSSIN, and the figures were put in by his famous brother-in-law, NICOLAS POUSSIN. The church has also an underground oratory and catacombs. A new street is in course of formation near the church; and as the civil engineers are not disposed to consider a church as sacred, the walls are so much shaken as to necessitate the suspension of services and the closure of the church. The plaster containing one of the frescoes has fallen in pieces, and the others are likely to follow if more precautions are not taken.

THE fire which broke out at Messrs. DOULTON's pottery in Lambeth on Tuesday has excited interest of an exceptional kind. It is felt that the damage is not to be measured by the loss in money. Messrs. DOULTON may be said to have created a new industry, for not only have they proved how much can be done in one branch of pottery, but they have also shown that the applications of art are not yet exhausted. They have created a school of designers, and fortunately they are not without imitators. In the fire this week many pieces of pottery were destroyed, but with the aid of the staff they can be replaced. The business of the firm is so extensive and so much prudence marks the arrangements, we may be sure that no inconvenience to the public can arise from the fire. The stock is always large. But good wishes for the speedy restoration of the works will be expressed throughout the country.

As the late Duchesse DE GALLIERA expended more money than any lady of our time upon building and construction, her death should not be allowed to pass unnoticed in this journal. The name of the Duchesse does not, moreover, appear for the first time in *The Architect*, as the fine series of illustrations of the "Cities of Italy" which we published in 1873 were from paintings by PAUL BAUDRY in the mansion of the Duchesse in the Rue de Varennes. The Duchesse was born in Genoa, and that city owes much to her liberality. A sum of 25,000,000 francs was

expended on the harbour, the mansion belonging to the Duc, with its contents, a gift valued at 7,000,000 francs, was made over to Genoa, and in addition two hospitals were constructed at a cost of 7,000,000 francs. In Paris the erection of the Musée Galliera cost 5,000,000 francs, and a still larger sum would have been expended but for an error in drafting a deed by which the Musée became the property of the city, when the donor's intention was to enrich the State. Two blocks of workmen's houses cost 2,000,000 francs; 11,000,000 francs were spent on the erection and endowment of the Hôpital de Clamart, and no less than 24,000,000 francs upon the erection and endowment of an orphanage at Fleury, and an asylum at Meudon. The Duc was known as a great railway contractor and speculator, and is said to have left a fortune to his widow that was valued at nine millions sterling. The greater part of that vast sum has been expended for benevolent purposes, and builders have reason to regret the loss of so munificent an enthusiast.

THE care which is now bestowed on the decoration of steam-vessels is exemplified fully in one of the latest additions to the Castle Mail Packet Company's fleet. The *Roslin Castle*, which is now on her way to the Cape after alterations, was decorated from the designs of Mr. G. DUNCAN, of London. In the principal saloon the prevailing tone is a soft bluish grey, intermixed with vellum tints and relieved with gold, blending harmoniously with the rich satinwood panelling. The iron girders which support the ceiling and upper deck have been treated with gold and the above-mentioned colours. Portraits of MILTON, HOGARTH, WREN, BEETHOVEN, and other celebrities, painted by an everlasting process on raw sycamore wood, have been introduced with happy effect round the lining of the skylight. The ladies' boudoir is sumptuously upholstered with green brocatelle, and is panelled with cedar and sycamore. The new ceiling in the principal smoking-room, with its octagonal panels, is exceedingly rich in colour. The walls of the spacious ventilating shaft are of a bluish grey, stencilled with a rich design in a similar, though lighter, colour in imitation of flowered silk. All the state-rooms have been handsomely enamelled and decorated.

THE five designers who are to take part in the second competition for the diploma of the Paris International Exhibition are MM. LOUIS BONNIER, architect; HENRI DANGER, of the Ecole de Rome; DANIEL DUPUIS, engraver; GEORGES DUVAL, architect; PIERRE VICTOR GALLAND, painter; and MICHEL LANÇON, sculptor. M. GALLAND's name is well known, but the other competitors have yet to gain renown. The first designs have given rise to much disappointment. What was most remarked in them was the general absence of any recognition of the purpose for which the diploma was intended. As was to be expected, the failure has given rise to attack against the official system of art education. The second designs are to be lodged in Paris before February 1, and if one is accepted the artist will receive 10,000 francs.

THE Sèvres vase which M. CARNOT offered as a prize in connection with the Black and White Exhibition of Paris has been awarded to M. LEVEILLÉ, the wood-engraver. The jury considered it should be the prize of an artist who had already received a recompense of a different kind. The gold medal of this year's exhibition was gained by M. KARL ROBERT, who, it appears, is the son of M. MATHIEU MEUSNIER, the sculptor.

THE Belgians have an expectation that their section of the Paris International will be superior to all but the French division. M. JANLET, who designed the façade of the Belgian building at the exhibition of 1878 is the architect. In order to produce exceptional effect, it is decided that all the cases for the exhibitors are to be uniform in style. The Belgian armourers are expected to make a fine display of weapons of all classes. About 1,600 feet of rails will be laid down for the exhibition of the rolling stock of railways. All the industries will be represented in the machinery hall. Belgium will have about 2,000 exhibitors.



## PAINTING AT THE ART CONGRESS.

THE subject of a paper by Mr. F. Bate was "The Tendencies of Modern Art." He advocated a more thorough and intimate relation between artists and workmen, for in the applied arts the artists who did not know the technical details of work were worse than useless, and the same might be said of the workman who had no knowledge of art. It was said that there were 12,000 professional artists in London alone, and yet the proprietor of an illustrated paper, who spent 500*l.* a week on illustrations, said that in spite of this fact he had to look to France and elsewhere for his artists' staff. With regard to art education, he asked what had the Royal Academy done in this direction? and asserted that the Royal Academy Schools did not take a high rank as a teaching institution in the world. Then, again, in the election of members, in the acceptance of works for exhibition, the Royal Academy had been unfair, illiberal, and narrow-minded.

Mr. Alma-Tadema said he was rather afraid the tendencies of the reader of the paper were against the Royal Academy. It could not be helped. The question of art education was a very difficult question, which one could hardly in a few moments discuss, but which one might give a few flying thoughts upon. They were forced to the conclusion that no education by machinery would be complete, because its value could only be judged after it had produced its results. Theoretically, principles in those matters could only prove their true value by the results they produced; therefore Englishmen found that the Royal Academy, which was established on the same principles as the academies of other countries, was not sufficient, and therefore the system of governmental art schools was introduced. Those schools had influenced the country greatly, and, as they had heard, those schools had not answered the purpose for which they were founded, because experience taught them that those admirably trained pupils were not practical enough; they did not know enough of the way in which their drawings ought to be applied. He knew that the Royal Academy was a poor body—they did not represent anything outside their own body, and had left a great many artists outside. But still the Academy had produced such artists as Sir John Millais and Mr. Frank Holl, both pupils and medallists of the Academy. He thought the Academy had still a little bit of love for art left in it; they of the Academy tried and did their best to teach their pupils, so that they need not go to France to learn to paint pictures of sand with a little bit of grass and a figure in the foreground. He thought that a country who could boast of a Reynolds, a Turner, a Constable, a Millais, a Holl, and many others who were all taught at home, need not fear for the future of its art.

Mr. Brett, A.R.A., said he had an acquaintance of fifty years of the Royal Academy, and the only education in art he had had was got from the Royal Academy, and he said they would have no art in England at all but for the Royal Academy.

## The Emancipation of the Picture.

Mr. Reginald Hallward read a paper on "The Emancipation of the Picture." He declared that the cause of the existing depression in the painter's art was not primary economic, but intellectual. The standard of excellence was not high enough, and the bulk of pictures indicated intellectual inferiority. He attributed great blame to the Royal Academy, the accepted representative body which but recently opened its doors still wider for the encouragement of the painter of pictures. The attitude of the Academy towards all this handicraft attempt, the product of the schools, had been one both of carelessness and misdirection, proved by its persistent encouragement of work in a false direction. To the Academy they must look for these reforms which would make its control wise and effective, and first of all in the matter of reform must come the curtailment of the number of pictures exhibited, and the raising of the standard of work by higher tests. Art must be allowed to develop in new quarters, and the Academy must limit the gross and unexampled encouragement of mediocrity in the painter's art.

## Art Education.

Mr. Holman Hunt read a paper on this subject. He said the system of instruction at the Royal Academy and also at the South Kensington schools failed to have the highest results because there was no bond of interest and affection between the student and the master. The most excellent system that ever existed in the world was that pursued by the old masters, who had their students in their own studios. It was often carelessly said that the French still preserved this principle of instruction, but this was a great mistake. The English teaching in the life and the painting schools given in monthly courses by the best masters was interesting, and a really unprejudiced and painstaking student might derive much instruction from them if the original intention were fully acted up to. But his impression was that the really desirable masters generally deputed a substitute glad of a guinea to act for them. With

regard to the present position of art in this country, he said the real cause of complaint was that our taste was not independent enough; it was frightened by the oracles of taste, and so became unsettled and lukewarm. It was not considered that in the long future England would be judged by the art it leaves. Some of the evils of the present day, such as the excess of students, were scarcely under their control, although he strenuously suggested an inquiry as to whether the giving of medals in art schools was not fraught with evil, as encouraging mediocrity. A lad on being thus rewarded for skill of a very elementary kind was easily persuaded to believe himself a genius. Mr. Holman Hunt referring again to the Royal Academy, and as an example of the encroachments of which this amiable body could be guilty, he pointed to an innovation lately made at Manchester and Liverpool. A work by an R.A. had inadvertently been rejected at an exhibition in one of these cities, and in order that this should never occur again, the Academy Council had made an arrangement by which a member of the Academy should henceforth be annually supplied to the provincial committees. This central system he stoutly protested against. The conclusion of the whole matter was that the Academy must be persuaded to adopt a system that would better represent the profession. In concluding, he referred to Sir F. Leighton's opening address, with which he quite agreed, except his laudation of the French nation, as opposed to our people, as having an exceptional sense of beauty. That the French had had great artists he admitted, and also that they were tasty and neat, that their women could put on a cap and their cooks serve up a dish with great daintiness. But he did not regard their decorative work as worthy, and their paintings were so often merely illustrations of a page in history, or dull and ugly old men playing cards or chess, without a spark of beauty. We must avoid too narrow an interpretation of the word beauty, but they must refuse to recognise brutal and sensual art.

## Pictorial and Decorative Art.

Mr. John Brett, A.R.A., read a paper, his object being to show that decoration meant merely artistic completion of a useful structure, and was not a separate art of itself. Fine art was generally supposed to comprise the pictorial, the plastic, and the architectural arts; but he did not think that classification altogether philosophical, inasmuch as architecture was primarily utilitarian, and clearly transgressed in some respects the definition of fine art. As regarded sculpture, in the best periods it had always been associated with architecture, and constituted the noblest form of decoration. It appeared, therefore, that unless they could find a better definition for the term "fine art," it was only applicable strictly to pictures. Good decoration depended upon the adaption of organic forms to a geometrical structure, but for this purpose the imitation of natural objects would not answer, for two reasons. The first was that beautiful natural objects were too difficult to reproduce, and therefore too expensive; the second that they required to be infected with the inorganic or crystalline motive, so as to make them harmonise with the geometrical contours and take them out of competition with reality, a competition in which their necessary failings would show a painful shortcoming. It was also desirable that the images should not be thrown together haphazard, but composed so as to show purpose and taste—that was to say, set in order with rhythmical sequence and cadence. The pictorial art, on the other hand, while admitting to a certain extent of that sort of discipline and constraint in the disposition of the images and areas of colour, put itself deliberately into competition with nature, and in its highest achievements quite successfully. The truth about the pictorial art was, he believed, that however earnestly the artist might wish to give a faithful resemblance of nature, some bias from his individual taste was inevitable. He emphatically stated that good decorative art was not any nearer the reach of the masses or the poor or moderately poor working people than was good fine art, for the cheap process of the factory could not produce it. A great decorative epoch was one in which all the workpeople engaged on a building or in the making of garments had free license to indulge their individual taste, and, as far as he could judge, that was incompatible with factory practice. The art-worker must still fight for his own hand. If he depended on the direction of the manufacturer, he thought he would soon become a manufacturer too, and the art would evaporate from his work.

Mr. Brett's paper did not give satisfaction to the section, especially the remarks in which the dignity of a fine art was no allowed to architecture.

Mr. James T. Watts protested against a tendency of the congress to underrate the dignity and influence of the pictorial arts in favour of the minor decorative arts. Without disparaging decorative art, let them always remember that pictorial art in addition to giving æsthetic delights of light and colour could and did excite definite emotion, and convey definite ideas no other arts could—notwithstanding Sir Frederick Leighton's apparent statement to the contrary. Hunt's *Light of the World*,



G. F. Watt's *Love and Life* and *The Worship of Mammon* exercised a wide and noble influence by exciting emotion and conveying ideas. He regretted to see artists themselves so readily abdicating their higher functions, and said that as "conduct was three-fourths of life," the pictorial arts, in ceasing to try to influence conduct, were surrendering their chief claim to serious consideration. Yet even when so limited, they remain the apex of decoration.

#### A Strict Method for the Study of the Figure.

A paper contributed by Mr. W. B. Richmond, A.R.A., was read by Mr. Clausen. The writer said it would be better to find out where the old art gained and the new art has lost than to fold their hands in despair. That an artist could be made by education none could admit, but that he could be hampered, chilled, discouraged, and retarded by want of intelligent direction in his studies, most would allow. A man who had no ideas should not dream of being an artist; and it followed, therefore, that it was most important to give a student as much as possible the opportunities to follow his own bent, that whatever there might be in him to say should be said in his own vernacular; much more than that there was not in the power of education to give. He asked were not their modern systems of drawing life studies, simply for the sake of doing them, a very faulty idea, and there could be no doubt that rapid studies of movement embracing many views of a moving object would be more stimulating to the intelligence than copying one surface of the same could be. If that was true, why in the name of all that was rational did they persist in pinning their art students down to one view of a model for weeks of stumping or stippling? The writer then referred to the "botega" or artist's workshops of the flourishing and living period of Italian art, and said that their picture-painting did not take excessive precedence over the "crafts" as, unfortunately, it did now in the social mind. Art of every kind was then welded and bound together by the love for the beautiful, and all art workers in worthy emulation desired the crown of success for their achievements. They, therefore, hailed with pleasure such a society as the Arts and Crafts, whose exhibition that autumn had given all true lovers of design not only pleasure but hope—hope that slowly but surely might come a better time, when they might once again, as of old, be ruled by the necessity of beauty in every article of common use.

Mr. Wardlaw Laing said that as an old student no one could more cordially agree with the remarks in Mr. Richmond's paper, for he had always believed in some such supplementary training to the Academy teaching as Mr. Richmond suggested.

Mr. Phil Morris, A.R.A., condemned the practice of working so long from the antique in the Academy training, and said that the students worked so long from the antique that they became nothing more than draughtsmen from the cast. He recommended art schools to teach drawing from the life in preference to the antique, for it was more stimulative to the mind. He thought that it was to realism they must look in the future to help art, for it was only when a realistic painter rose that they got the true vitality of art.

Mr. H. Morris said that beginners found a difficulty in making a tone, and mechanical means must be adopted in the first instance.

Mr. Gilbert, A.R.A., said that in art education all means were justified by the end. They might teach as much as they liked, but they would never make an artist.

#### Next Year's Congress.

At a meeting of the members of the central committee it was unanimously resolved to elect as President of next year's congress at Edinburgh, Sir William Fettes Douglas, president of the Royal Scotch Academy.

President Conway read over a list of the committee whom it was suggested should be elected to arrange for next year's congress, when a member of the committee declared his firm conviction that it would be fatal to the Association if appointments were made in this way, regardless of the feeling of the locality in which the congress was to be held.

Mr. John Dun said he was afraid when the congress was over they would be told that they had nothing to show for it. He would certainly like to see some practical outcome.

Mr. P. H. Rathbone said they should for one thing appoint a small committee to prepare for next year's congress a clear and succinct report concerning art schools of different places and countries.

A Meeting of the Tamworth Town Council was held on the 6th inst., when it was reported that Mr. Joyce, architect for the new municipal buildings, had been instructed to prepare bills of quantity in connection with the new buildings. It was objected to pay 2½ per cent. to the architect for getting out the quantities. One member said the general fee was 1½ per cent., and was paid by the builder. The report was finally adopted.

### ROYAL INSTITUTE OF BRITISH ARCHITECTS

THE third ordinary meeting of the Institute of Architects was held on Monday the 3rd inst., Mr. Thomas Worthington, vice-president, in the chair.

Mr. MACVICAR ANDERSON, hon. secretary, said that Mr. Lacy Ridge at the previous meeting asked if the Institute had discussed and sanctioned the regulations drawn up for guidance in regard of the restoration of ancient buildings, and the hints to workmen in regard of the same, and he had replied at the time that the Institute had not. Mr. Ridge now by letter asked him to read an extract from the report of the committee to the Council in 1865, the adoption of which report Mr. Ridge said constituted formal action on the part of the Institute. Mr. Anderson read the extract, and observed that in his opinion there was a wide distinction between a paragraph in a report showing what action the Council had taken, and the discussion of a subject formally brought before the Institute.

The Secretary pointed to a medal and diploma of honour sent by Sir H. Sandford on the part of the authorities in Adelaide, in recognition of the photographs sent to the Exhibition there.

#### The Examinations.

The SECRETARY said that the November examination for the Associateship began on Monday, November 26, and concluded on Saturday, the 1st instant, when 31 out of 38 candidates who presented themselves passed and became qualified for nomination in the usual way as Associates of the Institute, namely, Messrs. H. W. Burrows, R. Langton Cole, S. A. Ell, T. Phillips Figgis, John Gethin (Penarth), M. A. Green, H. Griffiths (Sutton, Surrey), J. W. Gunnis, John Hudson, E. W. Jennings (Swansea), F. L. Jones (Queensland), C. Oury King, S. Inskip Ladds, H. V. Lanchester, R. S. Lorimer (Edinburgh), J. A. Macara, W. A. Moule (Brentwood), J. E. Newberry, G. J. Oakeshott, A. S. Parker (Exeter), W. Pywell, T. P. Roberts (Bristol), A. E. Taylor, W. S. Taylor, H. H. Thomson (Leicester), H. Tooley, F. W. Troup, Paul Waterhouse, W. R. Wells, W. A. Williams (Mountfield, Sussex), R. Willock.

Time did not allow the consideration on Saturday of the Ashpitel prize, but the Board of Examiners were to meet shortly, and an early announcement of their award would be made to the Institute.

#### Scientific Masonry Prizes.

The Secretary announced that three members of the Council had offered prizes, to be entitled "Scientific Masonry Prizes," as follows:—A prize of 10 guineas, and a second prize of 5 guineas, to be awarded to any British architect or student of architecture who produces, to the satisfaction of the Council, the best work on the following subject, namely, a design for the vaulting of an entrance-hall to a public building. The work must be sent in to the secretaries before 2 P.M. on March 30 next. Only candidates whose drawings and reports have been considered satisfactory will be asked to produce a model of the structure.

#### St. Mary-le-Strand.

Mr. MACVICAR ANDERSON said he thought that all would agree with him that the removal of the church of St. Mary-le-Strand, which had stood too long in ruinous condition, would be nothing short of a national calamity. There were Goths who desired it should be removed on the score that it impeded the traffic, &c. The allegations made he had from time to time taken on himself to disprove. The narrowest part of a bottle was the neck, and the narrowest part of the Strand was not at the church but that part opposite Mr. W. H. Smith's, and the neighbouring premises. The proper way would be to do away with the rubbishy houses that occupy the north side of the street. The street view, with the church, from whatever point it might be seen, was one of the finest in London. Being asked to do so he had examined the church, and found there would be no difficulty in renovating it at a reasonable cost. A meeting, which would be open to the public, was to be held on Wednesday at King's College, the Bishop of London in the chair, and he thought there would be no difficulty in getting the public to subscribe. He would like, therefore, to be in a position to show that he had the sympathy of the Institute in expressing the same views at the meeting as he had expressed that evening.

This desire received the hearty approval of the audience.

Mr. FRANCIS HOOPER, Associate, and holder of the Godwin Bursary, read a paper of which the following is an abstract:—

#### Building Control in Paris.

Mr. Hooper said that no English visitor to Paris could but have been struck with the care displayed in the laying out of the streets of the city, the regularity of the building frontages, and the admirable sites secured for many of its public buildings. The rapidity also with which land, bordering on thoroughfares newly opened by municipal improvements, is covered with well-constructed and dignified buildings, indicates the confidence of purchasers that their property will not be depreciated



by any action of their neighbours or of the municipal authorities. Leases of land for building purposes by private individuals are practically unknown in France, so that no restrictions exist such as are contained in many English building leases to prevent erections which would cause injury to an adjoining lessee on the same estate. Owing, also, to the subdivision of the land, it is seldom possible for an owner of property to effect local improvements for the mutual benefit of an estate and the community. Legislation, therefore, in regard to building operations, seeks to secure to building owners such protection in their mutual relations as shall not be injurious to the public, and at the same time affords to the community facilities for united action when improvements are required in any locality, either of a sanitary character, or to meet the demands of increasing traffic.

The French Civil Code of 1804 precisely defines the rights of respective owners of party-walls; it specifies the conditions under which openings for the admission of light may be made on sufferance in walls abutting on the boundary line, such being fitted with wire grilles and sashes glazed with obscured glass; the sills of such openings on the ground storey must be not less than 8 feet 6 inches above the floor level, and on the upper storeys not less than 6 feet 2 inches. It is further provided that no window-openings from which a view can be obtained over adjoining property (other than the roadway, which is regarded as common to all) shall be formed in a wall within 6 feet 2 inches of the boundary, if such is parallel to it, or 1 foot 11 inches if at a right or obtuse angle. Should a prescriptive right be secured by uninterrupted enjoyment of a window during thirty years, the adjoining owner in building must observe a distance of 6 feet 2 inches from the face of the wall, but is not restricted as to the height of his building beyond conformity with local by-laws. Such are the servitudes on land imposed by the Code of France.

The Alignment Act, which dates from 1607, gives power to municipal authorities to amend the lines of street-frontage by the adoption of a plan of alignment which imposes a servitude on all buildings in old streets which are in advance of the alignment, and preventing any structural repairs to foundations or walls as would prolong their existence before the alignment is effected. This Act, though slow in operation, has been adopted in many of the provincial towns with great advantage. Compensation is paid for the land contributed to the thoroughfare, but not for the buildings upon it, as these may be occupied until rebuilding becomes necessary, and the amount (if no amicable settlement be made) is awarded by the jury of expropriation, which in Paris is summoned about every six months to settle all disputes which await it. Should it occur that so much of a plot of ground is contributed to the street that it is impossible to erect a healthy building on the residue, the authorities are compelled to purchase the whole, and negotiations are made with the adjoining owner for the acquisition of the surplus, and he may, in turn, appeal to the jury for a valuation upon which he is willing to acquire it. In the event of the failure of all negotiations, the administration may obtain power to acquire the property of the adjoining owner by means of expropriation, and so deal with the two sites together. In Paris the Alignment Act is in constant operation, but the necessity for more rapid improvements leads both public and private bodies to seek powers for the immediate acquisition of property by the Expropriation Act of May 3, 1841, for works of public utility. The procedure involves the preparation of plans, in accordance with certain rules, to fully demonstrate the intentions of the promoters. These plans are exhibited to the public for fifteen days, in provincial cities at the town hall, in Paris at the Mairie of the arrondissement.

The exhibition is announced by advertisement in local newspapers and by placards in the district, and an agent is appointed by the Prefect of the Département to attend on his behalf, for three days, to receive and report all verbal and written observations made to him by those interested relating to the necessity or efficiency of the scheme. Should the promoters act on any of the suggestions made in the report, the revised plan is again exhibited; but otherwise it is at once transmitted by the Prefect, with the report and his observations, to the Minister of the Interior, and becomes operative with the approval of the Chief of the State. The scheme having been thus approved, the plan is again exhibited for eight days, to show the property required for its execution, thus affording an opportunity to all persons interested to verify the representation and description of their property, and to put themselves into communication with the promoters for the settlement of their claims to compensation. In the event of the promoters failing to secure an amicable settlement of the claims, application is made to the High Court of Justice for the appointment of a jury to fix the awards. The Act of June 4, 1853, provides that this "jury of expropriation" shall consist of twelve persons, having the same qualifications as in criminal cases—that is, being upwards of thirty years of age, and entitled to the parliamentary vote.

The Court appoints a judge (*magistrat-directeur*) to preside,

and summons sixteen jurymen, with four supplementary persons, whose names are made known to the claimants, together with the offers of compensation. The promoters and the claimants have each the right to cancel two names from the list of jurymen summoned, after which the first remaining twelve constitute the jury, which remains intact until all claims relating to the scheme are settled. The jury examines documents and witnesses, and also visits the property, and its award is binding on both parties, unless appeal is made within fifteen days to the Cour de Cassation, or High Court of Appeal, the costs being taxed by the judge.

Having cited the Acts under which powers are obtained for effecting municipal improvements, it is necessary now to add that the Alignment Act requires the permission of the Prefect of the Département to the erection of any building bordering on the public highway. The whole of the streets of Paris are classed as belonging to the highway, or Grande-Voie, and in consequence plans of every proposed building must be submitted to the Prefect of the Seine, and such buildings must conform to the by-laws of the Département.

A special staff of the Prefecture of the Seine is entrusted with the custody of the plan of Paris, and records all authorised realignments, so that when applications for permission to build are submitted to the Prefect the necessary conditions are defined in granting the sanction.

Many of the provisions of the Paris building by-laws are dependent on the strict alignments already referred to, the conditions varying with the effective or intended width of the streets. The height of a front wall in a street 65 feet 6 inches in width may be 65 feet 6 inches; but in a street of 25 feet 6 inches may not exceed 49 feet. A building, however, at the corner of streets of unequal width, may return along the narrower street for a distance of three times its width. No wall adjoining a thoroughfare may exceed a height of 65 feet 6 inches, even though facing a boulevard or open square. The roof above the façade must be contained within the perimeter of a semicircle drawn from the face of the wall, its centre being level with the top of the wall, and its radius equal to half the effective width of the street, but in no case exceeding 27 feet 6 inches. The minimum height of a room erected at the ground level is 9 feet 2 inches, and of the basement and upper storeys 8 feet 6 inches. Further, the storeys may not exceed seven in number above the ground, including attics. The minimum area of courtyards and air-shafts is regulated by the height of the enclosing walls. The legal projections of cornices, string-courses, plinths, balconies, &c., over the public thoroughfare are dependent on the width of the street in which they occur, and are measured from the street line, so that where greater projection is desired for the perfecting of a design it is necessary to set back the building; hence the flatness so detrimental to the effect of many of the Paris façades.

The *commissaires-voyers* of Paris, whose duties correspond to those of the district surveyor, are twenty in number, and each has charge of one of the arrondissements into which the city is divided, with an office at the local mairie.

The erection of buildings for the public service in Paris is usually entrusted to architects whose designs have been selected as a result of open or limited competition. Such buildings may be classed in three categories: those which belong to the Municipality, to the Département of the Seine, and to the State. The appointment of architects for the two former is subject to the approval of the Prefect. The first category comprises the mairie, or offices of each arrondissement, the markets, day schools, public libraries, hospitals, mortuaries, &c. The control and maintenance of these buildings after completion are entrusted to ten architects, each having charge of two arrondissements of the city, and responsible to a superintending architect at the Prefecture of the Seine, and each has the title of *architecte de la ville*. The buildings belonging to the Département comprises the workhouses, reformatories, courts of justice, the residence of the Prefect, &c., and are under the control of two architects charged with their maintenance. The buildings of the State comprise the national palaces, museums, picture galleries, monuments, houses of parliament, public offices, &c., and are each severally in charge of an architect appointed by the Minister of Fine Arts, and are responsible to the Director of Works of Civil Buildings.

The Prefect of the Département of the Seine is advised on all important questions affecting the architecture of the city of Paris by the Conseil d'Architecture, or Standing Council of Architecture, which is attached to the Prefecture, nominated and presided over by the Prefect. It is composed of four of the senior architects in active service attached to the Prefecture, with five honorary architects who are on the retired list, having spent thirty years in the service or reached sixty years of age, together with independent architects, amongst whom are at the present time MM. Charles Garnier and Bailly, both members of the Institut de France. Meetings are held weekly, and the remuneration of the members is by a nominal fee on attendance (*jeton de présence*). On questions such as concern the



construction of railways, canals, drainage, &c., the Prefect of the Seine is advised by the Council of Engineers attached to the Prefecture, which is composed of experts, nominated and presided over as in the case of the Architectural Council.

The Ministers of State are advised on all important architectural questions, such as sites and plans for new public buildings and monuments, the laying out of new thoroughfares, and the improvement of old streets by the Conseil-général des bâtiments civils, or General Council for Building, which is a standing architectural council attached to the Ministry of the Fine Arts, and composed of the Director of Works of Civil Buildings, four inspectors-general of that service, and four distinguished architects nominated by the Minister. The director and inspectors are permanent members, whilst half of the temporary members retire annually, and are not eligible for reappointment as members until after an interval of two years. All are paid a fixed fee annually for their services, and the appointment as a member is one of the highest architectural distinctions. The present permanent members who are inspectors-general (the late M. Questel's place has not yet been refilled) are the following:—

M. Garnier, M. André, and M. Diet, all members of the Institut.

The temporary members for 1888 are the following:—M. Faure, M. Moyaux, M. Le Clerc, and M. Bernier. Acting on the advice of competent professional judgment, State officials are relieved of much personal responsibility, and the public enjoy the security which such advice affords for the wise administration and expenditure of funds.

Mr. WILLIAM WOODWARD said the paper came at an opportune moment, when London was in a state of transition in its management with the advent of the County Council. The paper endorsed a view held by many, that London architecture was spoiled by rights of light and air enforced by adjoining owners. If litigation arose, it was entirely the fault of architects themselves. Architects knew what rights pertained to neighbours, and it lay within their control to design the buildings so as not to interfere with neighbour's rights. The question of alignment was absolutely essential to the well-being of every city. Much that was to be regretted in carrying out improvements in London would have been avoided if the French regulations were in force here. As it was, the public remained in ignorance till it was too late to correct the evils. The desirable custom of exhibiting the plans was one adopted in Rome as well as in Paris. Mr. Woodward referred to the laying out of new streets, and instanced the new street from Holborn Town Hall to Islington, which should have been laid out in the first place wide enough to carry the traffic. Under an Act of George II. the street from Islington to Paddington had been formed, and there was a stipulation that any building which encroached over the line of frontage should be pulled down as a common nuisance. Within the last three months an application had been made to the Metropolitan Board of Works for leave to erect a structure projecting 35 feet beyond the line of frontage. The Board of Works forwarded the application to the Marylebone vestry, who would not consent, yet in face of the opposition of the local authority and of the Act of George II., the Board of Works had absolutely consented to the encroachment. The disfigurement of that magnificent avenue was then only a question of time. Public criticism would have prevented such a scandal. In any future legislation care should be taken not to hamper architects too much, or they would have the same dull monotony as in Paris. Speaking of the French system of designing public buildings, Mr. Woodward thought it might be useful here, for they could not always count on having a Mr. Taylor and a Mr. Tanner, whose works designed as departmental office would compare favourably with those of independent architects. He concluded by saying that the church of St. Mary-le-Strand was, with Mr. Anderson, in safe hands.

Mr. CHARLES FOWLER remarked that the Metropolitan Board in 1874 proposed an amendment to the Building Act containing provisions to limit the height of buildings. That was opposed, and witnesses brought forward—among them the late Mr. Barry—by the opponents, with the result that the Bill was thrown out. It was also a point with the Select Committee of the House of Commons, who did not think it fitting that the height of buildings should be limited. He agreed with Mr. Woodward that any subsequent legislation should be carefully framed so as not to interfere with architecture. The short Bill to limit height of buildings was crude and negligently prepared. There was no standard by which to determine limits of height. It would not pass, but it showed what was in the air, and the Institute should see that future legislation took the right course. To his mind the obtaining a right of light by prescription had always seemed the obtaining of something for nothing, an arrangement neither lawful or moral. It would be better to be without it altogether, or at least that the right should be modified.

Professor KERR said the feature that struck him most was that in the whole administration of architecture in Paris the

architects governed. In England the liberty of the subject was so sacred that we were jealous of its being interfered with in the most modest way. When the Metropolitan Board was established it followed this old system in all honesty. The members had come together with more honesty and intelligence than they had been credited with. But the Board did not refer architectural matters to architects. They did not allow Mr. Vulliamy architectural authority. That would have been contrary to the English method, though when they got into trouble they shifted the blame to architects. The misfortune in England was that architects were not referred to. In France architects were universally referred to. The splendour in France was no more costly than our ugliness here. Much would be effected for good if architects here were admitted to some small share of authority.

Mr. R. PHENÉ SPIERS, F.S.A., referred to the church of St. Julien des Pauvres, which was going to be pulled down, and the opportunity of drawing and measuring it before it should be too late.

Mr. T. BLASHILL said the County Council would, at any rate, have the opportunity of doing useful service. It was well to know what was done in other countries; but, even so, the conditions were different, and we could not be supposed to adopt other methods without consideration. The Institute of Architects, as Professor Kerr had said, did not come to conclusions. If it did so it would have more influence than any official body in London. No public body here could carry out public improvements in the reckless way private investors could. They always had the fear that they would be spending too much of the public money and increasing the rates and taxes. Mr. Blashill then suggested that critics should inform themselves of facts before committing themselves to criticism. The acquisition of a bit of land apparently involved no great expenditure. But let any one once learn the amount of compensation that owners asked for, and he would find out how costly it was. To go to arbitration generally made matters worse. As to width of streets, there was no street that was not found too narrow as soon as it was opened and traffic developed. Mr. Woodward was wrong in saying that the new street had to take the whole traffic of Gray's Inn Road. It took only half at most, as it was now divided between two streets. He did not say, though, that they were wide enough. Mr. Woodward also forgot that the Act of George II. had been repealed in 1855.

Mr. WOODWARD asked leave to state that he had said that in addition to traffic from Gray's Inn Road, the whole of the traffic of Shaftesbury Avenue and the new Clerkenwell Road had to be carried. The question whether the Act of George II. had been repealed or not was still before the lawyers. The gravest matter of all, that of permitting the encroachment, Mr. Blashill had passed over in silence.

Mr. LOVEGROVE and another Member made a few remarks, after which a vote of thanks to Mr. Hooper for his paper, on the initiative of Professor Kerr and Mr. Fowler, was passed by acclamation.

Mr. HOOPER having replied, the meeting was adjourned.

#### THE ROYAL SCOTTISH ACADEMY.

THE Associates of the Royal Scottish Academy lately sent the following memorial asking for a reform of the Academy:—

*Unto the President and Council and the General Assembly of the Academicians of the Royal Scottish Academy. The Petition of the undersigned Associates of the Royal Scottish Academy*

Humbly sheweth,—That the primary object of the institution of the Royal Scottish Academy is to promote the advancement of the fine arts in Scotland, and to afford facilities, by means of schools, for the prosecution of the studies of painting, sculpture, and architecture, and other branches of art connected with these studies.

That by the constitution and laws of the Royal Scottish Academy the Associates (while they have a deep and growing interest in its objects, as defined by its constitution, and have, in addition, this important interest in its funds, that they and their widows are entitled to participate in the benefits of its pension fund) have no voice in the government of the Academy, or in the election of its members.

That your petitioners desire to bring before the President and Council and General Assembly the advisability of widening the basis of the Academy, of enlarging its area of usefulness, and of attaching to it by a closer tie the large and increasing body of Scottish artists, who are at present without adequate prospect of being brought within its sphere of usefulness.

That your petitioners believe these artists might, with enormous advantage to the Academy itself, be in some way



associated therewith, and allowed to feel that they are adding to the strength of, and assisting to extend an institution which, in its true aims and objects, is worthy of the highest support.

That your petitioners are assured that any steps in this direction would necessarily encourage and foster what all would desire to see, namely, the establishment of a flourishing school of art, which would retain its hold upon students, who at present find it necessary to complete their studies elsewhere.

That your petitioners humbly venture to suggest that the objects above referred to would be best and most easily attained by such an amendment of the constitution as would involve:—

- (1) No limitation to the number of Associates, so that, in the event of several artists of distinguished merit being candidates, their admission should not be delayed; while, on the other hand, if no such person be upon the list for the time being, an election need not necessarily take place.
- (2) Giving Associates a vote in the election of Associates.
- (3) Rendering Associates eligible for teaching and other duties in the Academy's schools.
- (4) Giving effect to the existing law providing for the establishment of a school for the study of the antique.
- (5) The addition of two representative Associates to the Council of the Academy, and of one Associate to the Hanging Committee; and that the usual abstract of accounts, as issued to Academicians, should be likewise sent to each Associate.
- (6) Allowing the name of a candidate for Associateship to remain upon the list until he withdraw it.
- (7) Providing that no member of the Academy shall contribute more than five works of art to the annual Exhibition, and no outsider more than three; and
- (8) The precise definition in the laws of the Academy of the meaning of the term "Members."

May it therefore please the President and Council and the General Assembly of the Academicians to take the premises into consideration, and to take such steps as they may deem expedient, and as may be necessary, for giving effect to the petitioners' suggestions.

And your petitioners will ever pray, &c.

(Signed) WILLIAM HOLE.	J. DENOVAN ADAM.
G. W. JOHNSTONE.	JOHN MURRAY.
J. HAMILTON.	DAVID FARQUHARSON.
ROBT. M'GREGOR.	PATRICK W. ADAM.
ARTHUR MELVILLE.	J. H. LORIMER.
GEO. AIKMAN.	R. P. BELL.
W. G. STEVENSON.	DAVID G. STEELL.
J. CAMPBELL-NOBLE.	

The reply states that "The Academy is at present engaged in the consideration of the steps necessary to forming a new charter, and of the alterations in the terms of the present charter which it is desirable to embody in it."

### THE ROYAL ACADEMY SCHOOLS.

THE prizes gained by the students, both male and female at the Royal Academy Schools, were distributed on Monday night by Sir Frederick Leighton, P.R.A.

The President said he had not this year to ask them to listen to an address from him, but he would detain them for a few moments with some remarks on the general character of the competition. In the various classes there were various degrees of excellence. In some subjects they had not passed the average level of past years, and in one class of competition no prize had been awarded on account of the high standard which it was desired to maintain in that particular class. On the other hand, in some branches of study the results were excellent—as, for instance, in sculpture, in which the work done was fully up to the steady level of improvement which had been noticeable for years past. For the paintings from life a *proxime accessit* had been added, as the competition was very keen, and in the cartoon of a draped figure the work had been exceedingly good. In the designs for the decoration of a public building the average, which was a very high one, had been kept up. Before passing on to the announcement of the names of the successful students, he would repeat what he had said on former occasions to those who would go away empty-handed. He would bid them remember that the resolutions of the members were not hastily arrived at, and that it was after much labour and trouble and weighing of merits that the line was drawn which divided the successful from the unsuccessful. Of one thing he was sure, and that was that, with that generosity which always characterised the youth of England, they would heartily applaud the more fortunate among their fellow-students.

The following are the prizes awarded, with the names of those who gained them:—

Landscape painting.—Creswick Prize (30*l.*), John Henry Frederick Bacon. Painting of a figure from the life.—Silver

medal, 1st, Marcus Worsley Blackden; silver medal, 2nd, William T. Maud. Painting of a head from the life.—Silver medal, 1st, Stephen Briggs Carlill; silver medal, 2nd, Percy Short; *proxime accessit*, Ernest Appleby. Copy of an oil-painting.—Silver medal, 1st, Thomas Eyre Macklin; silver medal, 2nd, not awarded. Copy of a landscape.—Silver medal not awarded. Cartoon of a draped figure.—Silver medal and prize (25*l.*), Arthur George Walker. Design in monochrome for a figure picture.—Armitage Prizes, 1st (30*l.*) and bronze medal, Leonard Leslie Brooke; Armitage Prizes, 2nd (10*l.*), William T. Maud. Design for the decoration of a portion of a public building.—Prize (40*l.*), William Farran Littler. Drawing of a figure from the life.—Silver medal, 1st, Stephen Briggs Carlill; silver medal, 2nd, Harry Windsor Fry. Set of six drawings of a figure from the life.—1st prize (50*l.*), not awarded; 2nd prize (25*l.*), Stephen Briggs Carlill; 3rd prize (15*l.*), Sigismund C. H. Goetze; 4th prize (10*l.*), John Henry Frederick Bacon. Drawing of a head from the life.—Silver medal, 1st, Alice Maria Dicker; silver medal, 2nd, Ernest Spence. Drawing of a statue or group.—Silver medals, 1st and 2nd, no competition. Drawing of a statue or group.—Prize (10*l.*), Ella Brown. Prospective drawing in outline (open to painters and sculptors only).—Silver medal, no competition. Model of a design.—1st prize (30*l.*), Herbert Charles Nye; 2nd prize (10*l.*), Arthur George Walker.\* Set of three models of a figure from the life.—1st prize (50*l.*), Henry Charles Fehr; 2nd prize (20*l.*), John Wenlock Rollins. Model of a figure from the life.—Silver medal, 1st, Henry Charles Fehr; silver medal, 2nd, Charles John Allen. Restoration of a mutilated antique statue.—Silver medal, not awarded. Model of a statue or group.—Silver medal, 1st, Paul Raphael Montford; silver medal, 2nd,† Model of a statue or group. Prize (10*l.*), Anna Maria Gayton. Design in architecture.—Travelling studentship (60*l.*), Arthur Rutherford Jemmett. Set of architectural drawings.—Silver medal, 1st, Charles Spencer Haywood; silver medal, 2nd, not awarded. Set of architectural designs (upper school).—Prize (25*l.*), George William Nicolay. Set of drawings of an architectural design (lower school).—Prize (10*l.*), Francis Donkin Bedford. Prospective drawing in outline (open to architects only).—Silver medal, Amos Francis Faulkner.

The Landseer Scholarships in painting and sculpture, of 40*l.* a year each, tenable for two years, given for the best work done in the examination for passing into the second term of studentship, have been awarded—in painting, to Percy Short and Harold William Boutcher; in sculpture, to Thomas Richard Essex and William Henry Prosser.

The galleries containing the competition works were open to the public on Tuesday.

### LEEDS ARCHITECTURAL SOCIETY.

ON Monday evening a meeting of the Leeds and Yorkshire Architectural Society was held, Mr. H. Perkin in the chair. A paper on "Beauty in Colour and Form" was read by Mr. John Adam Heaton. He said that though now a Londoner, he was a native of Leeds, and appreciated the compliment paid him of being asked to bring the subject before the Society. With regard to beauty in colour, nature must be the text-book, though they must not suppose that the colouring of nature and of art could ever be thought of as identical. False colour and false form were mere exaggerations, distortions, excesses of good colour and good form. What was wanted, therefore, above all things was temperance. Nature was always temperate. He did not forget that she had produced malachite, the bell-gentian, the sunflower, but she had never dressed anything in seventeen yards of magenta silk with a pea-green bonnet. That had been left to mankind to do. Many tropical flowers were of great brilliancy, but it should be borne in mind how short a time the brilliancy lasted, and what a moderate area there was of this gorgeous colour measured against the greens and greys and browns of the surrounding vegetation. In the case of the gayest flowering plant ever seen, a careful examination would reveal the fact that what to the careless observer seemed a blaze of a certain tint was in reality a mass of subtle gradations. A gorgeous sunset lasted but a few minutes, and was generally small in area compared with the whole arc of the heavens; and it was so full of gradations that observers argued, after it was gone, whether it was most red or most yellow or most purple, orange, and grey. A student of colour soon found out that beauty of colour began with gradation—that the loveliness of graduated colour was so great that, relatively, level colour was not beautiful. But he also found that there was no such thing as level colour in nature—natural colour was always in a state of gradation. Nature teemed with grada-

\* Disqualified owing to having received the same prize before.

† Only one student entered for this competition.



tions; even when she played high she did so with a splendid moderation. He had been asked to sleep in a room where the four walls were distempered naked smalt blue. He declined, and would sooner have slept in the street. He had made careful studies of many beautiful coloured things—flowers, iridescence on pigeons' necks and shells, peacocks' feathers, fresh mackerel, and many other such things—and he never came upon a piece of brilliant colour where he was not bewildered and puzzled by the complex ways in which harmonious and even opposing colours interlaced and died into each other. Having learned a practical lesson from nature, we should fearlessly stick to it, giving away or burning everything at home—picture, wool-work, mat, wife's dress, drawing-room curtains—everything that did not obey the new-found rules, and in time we should come to appreciate the value of quiet, moderate, tertiary tints. Not a few people desired above all things that their surroundings should be in the highest taste, and who were nervously anxious and uneasy as to whether things would "go with" sundry other things. In gathering a posy one gathered flowers as a rule without any idea of what would "go with" each other, but simply the flowers that happened to be blooming and of the right dimensions for the proposed posy, and in ninety-nine times out of a hundred the flowers gathered "went with" each other delightfully. Why, then, should people be so nervous as to whether the proposed carpet would "go with" the proposed curtains. Clearly because the colour of one or both was bad—crude, violent, or without gradation—and because while the posy was well mingled with green and grey and neutral tints, the carpet and curtains were wholly or partially deficient in these. If one wanted to try whether this practically was so, let him buy or borrow a really fine old Persian carpet, which would probably contain blues and greens, reds and yellows; in fact, almost as many colours as the garden posy. He would find that the chances were enormously in favour of its looking well in any room in which he might throw it down, with an entire disregard of what might be already there. Let them take care that each colour in each article they bought was soft and graduated and free from crudity, and then they might set them all together and be happy. As gradation was the condition of beauty in colour, so curvature was the ground of all loveliness in form; but temperance, again, was the ruling power. A vote of thanks on the motion of Mr. W. H. Thorp, seconded by Mr. Cribb, was accorded to the lecturer.

### THE LINE OF FRONTAGE.

AMONG the Bills which were read a third time and passed in the House of Lords on the 6th inst., was one called "Public Health Acts Amendment (Buildings in Streets) Bill." The amendment deals with the much-debated question between urban authorities and property-owners as to the building line to be observed in the erection of property. Up to a recent period it was generally thought by the law advisers to the different urban authorities that the 156th section of the Public Health Act, 1875, applied to new as well as to old buildings, but in the case of *Williams v. the Wallasey Local Board*, heard in the Court of Queen's Bench, March 20, 1886, it was decided by Justices Mathew and A. L. Smith that the section as it was then framed did not apply to new buildings in course of erection on land never previously built on. In consequence of this decision builders could build their houses just as they pleased without any regard to the building line, and the urban authorities could not prevent them. The 156th section, which permitted this, was repealed last week, and in lieu thereof it has been enacted:—"That it shall not be lawful in any urban district, without the written consent of the urban authority, to erect or bring forward any house or building in any street, or any part of such house or building, beyond the front main wall of the house or building on either side thereof in the same street, nor to build any addition to any house or building beyond the front main wall of the house or building on either side of the same."



### The Recent Art Congress at Liverpool.

SIR,—The eloquent president, Sir Frederick Leighton, informed the listeners to his opening address that, although there is "a considerable and growing number of those in whom the sense and perception of beauty is astir and active; although vast sums from the public purse are annually devoted to the promotion of art; that schools of art multiply, almost swarm over the face of the land; that municipal bodies are not remiss on this score; that day by day efforts in this direction become

more marked and effectual; yet the sense of abstract beauty with the mass of our countrymen is dull, blunt, sluggish, and superficial; the æsthetic consciousness is not with them a living force, impelling them towards the beautiful or shocking them with the unsightly and the hideous."

Yet, Sir, is not this rather a rhetorical flourish than a logical and practical address? and will you pardon my boldness in venturing to raise the question, and to make a proposal founded thereupon?

It is admitted that there is much to be satisfied with that, as a nation, we pay a liberal tithe in the interest of art. History shows that the great art epochs were a work of time, that many generations of architects, sculptors, and painters succeeded one another before perfection was reached. We—and especially the artists—of this present year of grace, of this wonderful Victorian era, have certainly advantages that are without precedent. I boldly assert that, as Englishmen, we possess genius for the arts, for no country need despair that can show the works of a Reynolds, a Turner, a Constable, a Leighton, a Millais, a Poynter, and others too numerous to mention. An English school of painting of very high repute was established by Hogarth and Gainsborough. Can it be said that it has no worthy representatives at the present day, or that there is no appreciative public? Sir Frederick's confessions would go far to refute the charge.

I think, then, that what is really desired by our artists is a quickening of the pace towards an epoch—a modern epoch—of British art, and that they make a mistake in thinking that lecturing and discussing will bring about the widespread love of art for its own sake which in the past has always distinguished those brilliant periods when no edifice was considered complete without sculpture, mosaics, and frescoes, and the furniture of ordinary mansions was fit for a king's palace, and "there was nothing vulgar or hideous" even in a cottage. I beg, then, to offer the following plan for consideration.

Let an influential and well-selected deputation of men known for their love of art and of artists wait upon the Government to urge the necessity of a Council of Art being established for the following purposes amongst others:—  
1. The purchasing or otherwise distinguishing works of the highest art character annually produced. 2. The purchased works thus honoured to be placed with some public ceremony, in which the successful artists should be conspicuous, in a gallery to be built or set apart for them at South Kensington.

I venture to think that, if something of this kind could be done, enthusiasm in the community would be excited, critical knowledge would soon be improved, and that enlightened public feeling, which in past times created universal good taste, would at no distant time be established in this country; for we should possess constantly before our eyes lofty standards of excellence which all young artists would feel they must attain to. And in the meantime love of art in the general public, the "æsthetic consciousness" of the masses (for whom Sir Frederick pleads so eloquently) would be a daily growing result. At all events, it appears to have been under some such circumstances as these that art and artists flourished during the great epochs of art.—  
Yours faithfully,  
HENRY TRAVIS.

The Limes, South Streatham: Dec. 11.

### BUILDERS' BENEVOLENT INSTITUTION.

AN election of one pensioner on the funds of this Institution was held at Willis's Rooms, St. James's, on the 6th inst., Mr. T. G. Smith (vice-president) in the chair, in the unavoidable absence of the president, Mr. J. Howard Colls. There were three candidates for the one vacancy, viz. two men and one woman. The poll was open from two to five P.M. Shortly after the close of the poll, the scrutineers, Messrs. C. Russell and Thomas Stirling, announced the result of the polling to be as follows, viz.:—James Pickering, 19 Mantua Street, Clapham Junction, aged 62, builder (fifth application), 2,079 votes; Ann Winter, 47 Maygrove Road, Brondesbury, aged 63, widow of Benjamin Winter, builder (third application), 2,185 votes; and Henry Whimple, 12 Devonport Road, Shepherd's Bush, aged 71, builder and decorator (first application), 1,817 votes (including 30 votes in respect of former subscriptions). The successful candidate was therefore declared to be Ann Winter. Among the friends of the Institution (other than those already named) who took part in the proceedings were Messrs. Thomas Hall, R. Perkins, R. Richardson, F. Foxley, G. B. New, and J. T. Bolding. A vote of thanks to the Chairman closed the proceedings.

### CHURCH BUILDING AND RESTORATION.

St. Olave's, York.—The following report from Messrs. Demaine & Brierley was read at a late meeting of the parishioners:—In accordance with your instructions, we have pleasure in submitting for your consideration designs for im-



proving the nave and north aisle roofs of your church. As to the nave roof, we propose to take off the present lead and deal boarding, and to straighten and refix the rafters where necessary, to lay thereon oak boarding covered with felt, and to recast the old lead and relay it on deal battens and boarding. On the underside we suggest curved and moulded braces to the principals, finished with angels carrying emblems, a carved and moulded cornice against the wall, and carved pateræ on each of the intersections of the principals and purlins. The new work will be of dark oak, to match the old. The north aisle roof will be entirely new, of Stettin oak, and will consist of curved and moulded principals, intermediates, and purlins, and moulded rafters covered with oak boarding, and a carved and moulded cornice along the wall. The outer covering will be of strong lead, laid on deal battens and boarding. We estimate the cost of carrying out these works as follows:—Nave roof, 280*l.*; north aisle roof, 275*l.*; architects' commission, 30*l.*; contingencies, say 15*l.*; total, 600*l.* The work, when carried out, will greatly add to the beauty of the church. It was resolved, that subject to the sum of 500*l.* being promised by January 1, an order be given to the architects to proceed with the work.

**Ballynascreen.**—This church, which is in the diocese of Derry, was recently consecrated. The building of the church, which is now, with the exception of the tower, new throughout, was originally begun as but an improvement and remodelling of the old church. Hence, as it stands upon the lines of the old external walls, arises a somewhat unusual plan. The church now consists of a choir or chancel 35 feet long by 16 feet, with lateral aisles or transepts, and a short nave and south porch. The tower has been converted into a baptistery, and a lofty arch opened out on its western wall. To the south of the southern aisle is a lean-to aisle or ambulatory, which gives another entrance to the church. The vestry and its porch are placed in the north side. The chancel proper extends 10 feet eastward of the transept arches, and is entirely reserved for the offices of the Holy Communion, while the floor is extended westward as far as the central columns of the transepts and enclosed with a low stone curb, thus marking off the portion of the church set apart for the officiating ministers, according to the ancient arrangement of the *chorus cantorum* in the primitive church. The eastward windows, a triplet in the chancel, and a double in the south aisle, are filled with stained-glass by Messrs. Clayton & Bell, which are reproductions of windows in Christ Church, Dublin. The new church is heated by Grundy's system of hot fresh air. The church has been designed and carried out under the care of Mr. Thomas Drew, R.H.A., diocesan architect of Down, Connor, and Dromore. Mr. John McNally, of Cookstown, has been the contractor.

### GENERAL.

**Princess Christian** visited the Royal Female School of Art, Queen Square, on Monday, to open the new studio—erected under the supervision of Mr. Ernest Turner—and for which a sum of 300*l.* is sought from the supporters of the school.

**Lord Windsor** opened the winter session of the South Wales Art Society and Sketching Club on Saturday. It was announced that among the artists who had promised to contribute to the next Exhibition were Mr. Holman Hunt, Mr. Walter Crane, Mr. Onslow Ford, Mr. Arthur Gilbert, and Mr. Henry Moore.

**An Industrial Exhibition** is proposed to be held at Ipswich in 1890, at which prizes will be awarded.

**An Exhibition of Pictures** was opened at Kilmarnock on Tuesday, the number of works exhibited amounting to 867.

**Mr. Samuel Sanders**, of Trinity College, has offered to present six handsome stone urns or vases to be placed on the southern and eastern pediments of the Cambridge Senate House, in order to complete the original design of the architect.

**Mr. John Hutchison, R.S.A.**, has just finished in the clay a statue of the late Dr. Gregor, for erection in the town of Nairn. It is 8 feet high and will be cast in bronze. A realistic treatment is adopted for the figure.

**Mr. Muir**, one of the Glasgow city councillors, has purchased Mr. Pettie's picture, *Two Strings to Her Bow*, and presented it to the Municipal Art Gallery. It is the first gift from a member of the Council.

**Mr. Henri Lafort** has been elected for the third time as president of the Society of French Aquafortists.

**A Competition**, restricted to architects, with prizes of ten guineas and five guineas, is announced in the *Journal of Proceedings* of the Institute for the design of the vaulting over the entrance hall of a public building. Mr. Harvey, in order to prepare competitors for the above, announces that he will undertake to hold a new class at the Guilds Institute, South Kensington, on Tuesday evenings. The course will comprise

thirty lessons; fee, two and a half guineas. In order to enable arrangements to be made for beginning the lessons on January 1, intending pupils should send in their names at once to Mr. Lawrence Harvey, F.R.I.B.A., 10 Great Queen Street, Westminster.

**The Countess of Warwick** on Saturday distributed the prizes to the students of the School of Art and Warwick Art Class at Leamington.

**The Anglo-Australian Society of Artists** have elected the following members:—Sir J. E. Millais, Hon. R. W. Allan, R.W.S., W. Follen Bishop, F. Bourdillon, F. Bramley, E. F. Brewtnall, J. M. Bromley, Percy Craft, Ed. Harris, A. Hartley, E. Blair Leighton, W. S. Llewellyn, J. M. McIntosh, Frank Short, W. Christian Symons, Percy Thomas, Frank Walton, R.I., and Hugh Wilkinson.

**Mr. John Honeyman**, of Glasgow, has taken as a partner Mr. John Keppie, who was principal assistant to the late Mr. James Sellars. The business will be carried on under the title of John Honeyman & Keppie.

**Mr. William Dawes**, of Manchester, has been successful in the competition for the additions to the Buxton Hydropathic Establishment and Winter Residence.

**Mr. A. Addinell** delivered a lecture in the Art Museum, Nottingham, last Friday, upon "Athens and Athenian Art." He said that Greek art flourished under a democratic Government, when all worked for the benefit of the State. English art had flourished under a limited monarchy, where everybody worked for themselves. What was needed in England was less selfishness in regard to art.

**Alterations** have been made to the General Post Office, London, embracing the ventilation, the latest improved form of Messrs. Robert Boyle & Son's patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

**A Church** is to be built at Haydock, near St. Helens, towards the cost of which Mr. T. W. Legh, M.P., has promised a subscription of 2,000*l.* and a site.

**The Stained-glass Window** forming part of the Montrose memorial in St. Giles's, Edinburgh, has now been completed. It is entirely heraldic in design, and contains upwards of thirty coats-of-arms, representative of relatives and companions in arms of the great Marquis. The committee who have had the charge of the erection of the whole memorial have, in arranging the window, had the benefit of the advice of Sir Noel Paton, Mr. Burnett, Lyon King of Arms, and Mr. George Seton. The monument itself is designed by Dr. Rowand Anderson.

**A Free Library**, erected by the inhabitants as a memento of the Queen's Jubilee, has just been opened at Nantwich by Mr. Brunner, M.P.

**The Memorial-stone** of the new town-hall to be erected at Fulham was laid by the Rev. F. H. Fisher, the vicar and chairman of the vestry, on Monday.

**Mr. Stead**, of Bradford, has been appointed borough surveyor of Harrogate in place of Mr. E. W. Harry, appointed to Cambridge.

**The Foundation-stone** of a new eye and ear hospital which is being erected at Hereford, from the designs of Mr. E. Lingen Barker, has been laid.

**Mr. William Owen**, architect, has been placed by the Chancellor of the Duchy of Lancaster on the commission of the peace for the borough of Warrington.

**Mr. Charles Mason**, of Nottingham, has been appointed assistant borough surveyor at Leicester. There were 165 applicants.

**The Leeds Town Council** have decided to borrow 200,000*l.* for carrying out town improvements. The Council have also purchased the Coloured Cloth Hall at a cost of 66,000*l.*, and it is suggested that a new central post-office should be built on the site.

**A Cottage Hospital**, fully equipped, and containing six beds, has been presented to the borough of Carnarvon by Mr. John Jones, to commemorate his election for the third time to the Mayoralty.

**Mr. W. A. Eekersley** will read a paper on the "Oroya Railway in Peru" before the members of the Civil and Mechanical Engineers' Society, at the Westminster Palace Hotel on Wednesday next.

**Mr. W. E. Cox**, at a meeting of the Historic Society of Lancashire and Yorkshire on Thursday, read a paper entitled "Notes on some of the Antiquities of Garston, and an Attempt to recover the Plans and History of the early Church of St. Michael from its recently-discovered Remains."

**The City Lands Committee** of the Corporation have agreed, subject to the approval of the Home Secretary, to demolish Newgate Prison and the Central Criminal Court, and to erect upon the site a new Sessions' House, suitable to the modern requirements, as well as a fine row of shops.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, DECEMBER 14, 1888.

## THE ARCHITECT AND CONTRACT REPORTER.

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No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

### TENDERS ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

### NOTICE TO THE PUBLIC.

By the Post Office arrangements THE ARCHITECT can now be sent to any part of the United Kingdom by an affixed Halfpenny stamp; hitherto the postage has very frequently been twopence per copy. The Publishers will be happy to forward, for 20s. per annum, post paid, THE ARCHITECT, to residents in towns and neighbourhoods to which there is no easy access by railway. Terms for the half-year, 10s.

Our readers are invited to address us on subjects of interest to themselves or the public. We shall be always ready to insert letters asking for a solution of any suitable questions of a professional or practical nature, and to receive replies to such inquiries.

### COMPETITIONS OPEN.

SOUTHAMPTON.—Feb. 1.—Designs are invited by the Executors of the late Mrs. H. Bellenden Sayer for the Erection of a Drinking Fountain. Messrs. Sharp, Harrison, Turner & Turner, Solicitors, Southampton.

YORK.—Feb. 16.—Designs, &c., are invited for the Erection of Courts of Justice and Police and Fire Brigade Stations. Premiums of £100, £50, and £25. Mr. George McGuire, Town Clerk, Blake Street, York.

### CONTRACTS OPEN.

ABERDEEN.—Dec. 17.—For Water-closets, Urinals, &c., at Marischal College. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

BALTINGLASS.—Dec. 15.—For Building 10 Labourers Cottages. Mr. J. R. Dagg, Clerk to the Guardians, Baltinglass.

BLAINA.—Dec. 24.—For Building Wall near Pontygwellwch Bridge. Mr. G. Stevens, Surveyor, Blaina.

BRADFORD.—Dec. 14.—For Building Shops and Business Premises, Rawson Place. Messrs. Fairbank & Wall, Architects, Craven Bank Chambers, Bradford.

BRADFORD.—Dec. 17.—For Erection of Farm Buildings near Scholemoor Cemetery. Mr. J. H. Cox, Borough Surveyor, Town Hall, Bradford.

BRADFORD.—Dec. 15.—For Building Sawing Shed, Engine Bed, Warehouse, and Stabling. Mr. S. Robinson, Architect, 5 Exchange Buildings, Bradford.

BRIGHTON.—Dec. 31.—For Erection of Two Blocks of Infirmary Buildings and Enlargement of Infants' Ward at the Workhouse. Mr. B. H. Nunn, Architect, 129 Queen's Road, Brighton.

BURNLEY.—For Building Residence and Extensions at Olive Mount. Mr. C. Parsons, Architect, 9 Grimshawe Street, Burnley.

CARLISLE.—Dec. 14.—For Pulling-down and Rebuilding Premises, Scotch Street. Mr. George Dale Oliver, Architect, Bank Chambers, Carlisle.

CHEVINGTON.—Dec. 15.—For Additions, &c., to Board School, Red Row. Mr. William Webb, 23 Newgate Street, Morpeth.

CONGLETON.—Dec. 20.—For Widening Dane Bridge. Mr. Stanhope Bull, County Surveyor. Chester.

DARLINGTON.—Dec. 27.—For Iron Roof and Additions to Swimming Baths. The Borough Surveyor, Town Hall, Darlington.

DARTMOUTH.—Dec. 18.—For Construction of Pontoon and Approach Bridge, Waiting Rooms, Booking Office, &c. Mr. J. D. Higgins, Secretary, Paddington Station.

DARWEN.—Dec. 19.—For Reconstruction of Bridge, Sudell Road. Mr. J. H. Stafford, Secretary, Hunt's Bank, Manchester.

GREAT WESTERN RAILWAY.—Dec. 18.—For Construction of Passenger Station and Goods Shed at Culkerton. The Secretary, Paddington Station.

GOOLE.—Dec. 19.—For Building Engine Shed. Plans, &c. at the Engineer's Office, Hunt's Bank, Manchester.



GOOLE.—For Erection of Two Galvanised Corrugated Iron Roofs on Sheds. Mr. H. B. Thorpe, Surveyor, Goole.

HALIFAX.—Dec. 14.—For Extension of Foundry and Pattern Room. Mr. J. Farrer, Architect, 29 Northgate, Halifax.

HARROW.—Dec. 18.—For Building Mortuary, Stabling, Cottage, &c., Roxborough Corner. Mr. C. F. Hayward, Architect, 47 Museum Street, Bloomsbury.

HEADINGLEY.—Dec. 24.—For Building Twenty-six Scullery Houses. Mr. Joseph J. Morley, 6 Wormald Row, Leeds.

HOLBECK.—Dec. 19.—For Building Ten Houses. Messrs. Swale & Mitchell, Architects, 98 Albion Street, Leeds.

KESWICK.—Dec. 15.—For Additions, &c., to St. John's Church. Mr. William Marshall, Architect, 28 Bedford Square, London, W.C.

KILLEAGH.—For Alterations and Additions to Church, Mr. J. F. Fuller, Architect, 179 Great Brunswick Street, Dublin.

LEEDS.—Dec. 17.—For Building Extension of Clothing Factory. Messrs. Smith & Tweedale, Architects, 12 South Parade, Leeds.

LEEDS.—Dec. 19.\*—For Any or All of the Works in the Erection of Ten Houses at Holbeck. Quantities supplied. Messrs. Swale & Mitchell, 98 Albion Street, Leeds.

LEWISHAM.—Dec. 28.—For Works in connection with Colfe's Grammar School, for the Leathersellers' Company. Mr. E. Lyne Parsons, Architect, 236 High Street, Exeter.

LYDD.—Dec. 15.—For Building Residence for Mr. E. Finn. Messrs. Hall & Jennings, Architects, 4 St. Margaret Street, Canterbury.

MANCHESTER.—Dec. 17.—For Building Library and News-room, Moss Side. Mr. W. R. Acton, Surveyor to the Local Board, Moss Lane East, Moss Side, Manchester.

NEWCASTLE-ON-TYNE.—Dec. 18.—For Building Riding School, &c. The Royal Engineer Office, 13 Bellegrove Terrace, Newcastle-on-Tyne.

NORTH-EASTERN RAILWAY.—Dec. 19.—For Additions and Improvements, Nunburnholme Station, and Engine Stable,

Coke Stage, &c., Scarborough. Mr. W. Bell, Company's Architect, York.

NOTTINGHAM.—For Pulling Down Old Buildings and Erection of Four Warehouses, Fletcher Gate. Mr. John Howitt, Architect, King John's Chambers, Bridlesmith Gate, Nottingham.

READING.—Dec. 20.—For Building Stabling and other Works. Mr. Albert W. Parry, Borough Surveyor, Town Hall, Reading.

RODLEY.—For Building Three Houses, Stabling, &c. Mr. T. Winn, Architect, 5 Park Lane, Leeds.

SHEFFIELD.—Dec. 21.—For Extension of Canal Warehouse. The Engineer, 28 London Road, Manchester.

TAMWORTH.—Dec. 15.—For Building Assembly Room in Connection with the Municipal Buildings. Mr. N. Joyce, Architect, Stafford.

TRIM.—Dec. 17.—For Conversion of Gaol into School for Pauper Children. Mr. A. Scott, Architect, Navan.

WOOLWICH.—Dec. 20.—For Building Wing on the East of Infirmary at Plumstead. Mr. J. O. Cook, Architect, 1A Eleanor Road, Woolwich.

## TENDERS.

### ABERDEEN.

For Repairing Wooden Bridge over the Burn of Cannie, Invercannie, for the Aberdeen Town Council. Mr. BOULTON, Borough Surveyor.

J. McRobbie, Aberdeen . . . . £49 13 0

### BRADFORD.

For Building Shops and Warehouse, Leeds Road, Laisterdyke. Messrs. EMPSALL & CLARKSON, Architects, 55 Tyrrel Street, Bradford.

### Accepted Tenders.

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H. & A. Thomas, joiner.

J. Wood, plumber and glazier.

J. Wheeler, plasterer and concreter.

A. Hill, slater.

J. Smith, painter.

\* Names and addresses to be forwarded not later than date.

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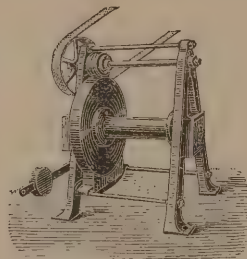
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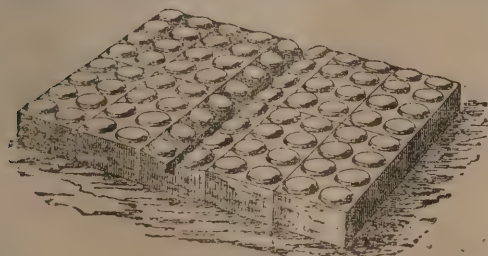
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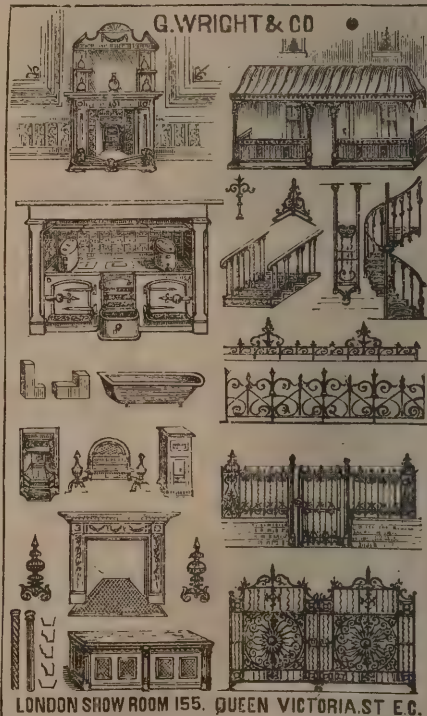
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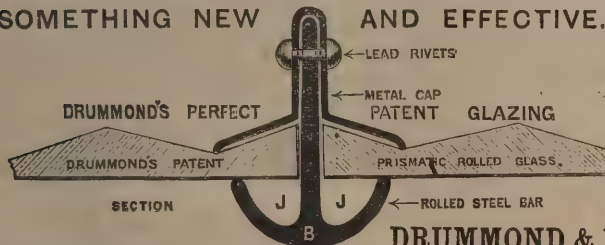
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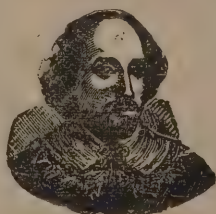
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## TRADE NOTES.

AT the last meeting of the Kilmarnock Town Council, plans for the Jubilee scheme for the erection of a bridge over the Irvine and a drive to Bellfield were considered, and that of Mr. Tait, Forth Bridge Works, was adopted, the premium of 10 guineas being awarded. The entire scheme is expected to cost about 2,500/, provided partly by rates and partly by public subscription.

THE new bridge between Glasgow and Hillhead, for which tenders are now being received, and which is to cross the Kelvin at Great Western Road, will be a handsome structure of granite, with iron arches. It will be 60 feet broad, or 20 feet wider than the present bridge. The work of reconstruction will be commenced in February next.

THE Oldbury Local Board have approved of a report of the Public Buildings Committee recommending the Board to purchase the freehold reversion in the land upon which the Public Hall stands, and the land adjoining, upon which it is proposed to erect the public buildings, containing 967 square yards, from the Oldbury charity trustees, at a cost of 400/. Also that Messrs. Wood & Kendrick, architects, of West Bromwich, should be requested to submit plans and estimates of the work for the proposed public buildings.

AT a meeting of the Evesham Rural Sanitary Authority on Monday, tenders for the supply of pipes for Wickhamford and Badsey Waterworks were opened, and that of Messrs. Firmstone Brothers, of Stourbridge, accepted, at the following prices:—3 in. pipes, 4/ 3s. 6d. per ton; 2 in., 4/ 3s. 9d. per ton; special castings (about 17 cwt.), 7/ 15s.

AT the monthly meeting of the Failsworth Local Board, plans of the proposed sewage works were submitted by Messrs. Lomax & Lomax, engineers, of Bolton, the estimated cost being 14,620/. Mr. C. J. Lomax, of the above firm, was appointed surveyor to the Board for a period of twelve months.

THE suggestions by the Local Government Board's architect of alterations in the plans of the proposed new cottage homes at Wednesfield have been adopted by the Wolverhampton Poor Law Guardians. This reduces the cost by 120/.

AT a meeting of the Ludlow Town Council a letter was read from Mr. Price, the contractor for the new Market Hall, asking the Council to allow him 50/ for Ruabon bricks for the facing of the new Market Hall, as he was unable to get the quantity

of pressed bricks locally, and he was anxious to push the building forward. If the Council allowed the 50/, he would still be at a loss of 35/ himself. It was decided that the Council ask the Market Hall Committee to grant the 50/., the money to come out of the Jubilee Fund.

AT Carlisle Mr. McKie, the city surveyor, has prepared a report for the consideration of the authorities and the citizens generally, upon the necessity for an extension of the main out-fall sewers and storm outlets of Carlisle, at an estimated cost of about 13,000/.

MESSRS. STEELE & WOOD, of Stoke-on-Trent, have just issued a sheet of designs, chromolithographed in numerous colours, of painted tiles for stoves, hearths, dados, pilasters, &c. Most of the sketches are well executed and very artistic.

THE ninth Architectural and Building Trades' Exhibition will be opened at the Royal Agricultural Hall, London, N., on Monday, April 1, 1889, under the management of Mr. Philip Shrapnel, of 20 Bucklersbury, London, E.C.

IT is stated that the Glasgow Corporation Street Improvement Trust has purchased the Gaelic Free Church, situated at the corner of Gordon and Hope Streets, at a cost of 31,000/., for the purposes of street improvements.

THE Honorary Freedom and Livery of the Worshipful Company of Turners of London has been conferred upon Mr. David Kirkaldy, M.Inst.C.E., "in recognition of his valuable services to Metallurgists, Turners, and all branches of Engineering, by his system of machinery and inventions for testing the strength and other properties of every variety of material used in the constructive arts."

WE are requested to state that Messrs. Keller Bros., of Hopton Wood Quarries, supplied the stone for the base of the Gordon Memorial.

A LINE of gas-piping has been completed at Pittsburg, Pa. The line is formed of 22,700 feet of cast-iron pipe and 400 feet of wrought-iron pipe, the inside diameter of the pipe being 36 inches. The cast-iron pipe weighs 485 lbs. per foot, and is 1 1/4 inches thick; the wrought-iron pipe is 3/4-inch thick, and weighs 190 lbs. per foot. The former has lead and asphaltum joints, with double escapes; the latter has an asbestos flange joint. All caulking is done from the inside of the pipe, so that the pressure of the gas will only serve to make the joint tighter. The pipe, when tested at the works, stood 300 lbs. pressure, and 80 lbs. pressure when laid.

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ELSTOW, near Bedford, well known as the birthplace of Bunyan, has just had its church restored under the care of Mr. T. J. Jackson, architect, and a handsome clock has been erected by Messrs. John Smith & Sons, Derby. The clock is fitted with all latest improvements. All the main wheels are of the best gun-metal, with their teeth cut from the solid, so as to be perfectly accurate and smooth. The main frame is arranged so that any separate part may be removed without interfering with the remainder, and steel wire ropes carry the weights. Messrs. Smith & Sons guarantee the clock to go with very great accuracy, and to form a standard of timekeeping for the place. The clocks at Wootton and Goldington, near Elstow, were also made by the same firm.

THE London Street Board School, Edinburgh, is warmed and ventilated throughout by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester and London.

A SUGGESTION for the construction of a deep-water dock at Workington is under consideration. The construction of a deep-water dock has also been proposed for Harrington. The Workington Town Council intend to try and induce the promoters of the scheme to co-operate with Workington.

#### REGISTRATION OF PLUMBERS.

AT a public meeting in connection with the registering of plumbers held in the Carlisle town-hall the Mayor presided, supported by Canon Ware, Mr. Crowder, Dr. Barnes, Dr. Lockie, Mr. Richard Forster, town clerk, Mr. L. H. Armour, secretary to the District Council for the North of England, and others.

Mr. Hepworth, C.E., secretary of the local Association affiliated with the District Council at Newcastle, read a letter from Mr. William Brown, Medical Officer of Health for Carlisle, who said:—"While doctors and pharmaceutical chemists are subjected to the most searching tests as to their fitness for their respective callings, plumbers, who, from the very nature of their work, are much more potent for harm, are allowed to practise their craft free from fear of exposure, without any tested qualification whatever. I maintain that a plumber ought to be not only instructed in the *technique* of his handicraft, but ought to have forcible mental

pictures presented to him, illustrating the disastrous consequences to which his incapacity or neglect may give rise. Such instruction would have a powerful influence in preventing the deplorable prevalence of wrong and imperfect workmanship, which, I believe, results more from want of special knowledge than indolence on the part of those who perform it."

The Mayor said that there was some want of technical education in the art of plumbing. We were all much in the hands of plumbers, and it might be taken as a sign of the interest in the trade, that there were so many doctors present. The object of the meeting, however, was to see if they could not pay rather less to the doctors and rather more to the plumbers. Plumbing was different from most other trades, and there was a responsibility, dignity and skill required in the art of plumbing which made it second to no trade in the country. The Prince of Wales, after a certain illness, declared that if he had not been Prince of Wales he would have liked to be a plumber. The Plumbers' Guild, one of the most ancient Guilds in London, intended to do all they could to help the plumbers of England and Scotland. He had been present at the recent banquet of the Guild when the master made a very interesting speech on plumbing and sanitation; but the real gist of the matter was that they had held examinations of plumbers all over England lately and only 30 per cent. had passed.

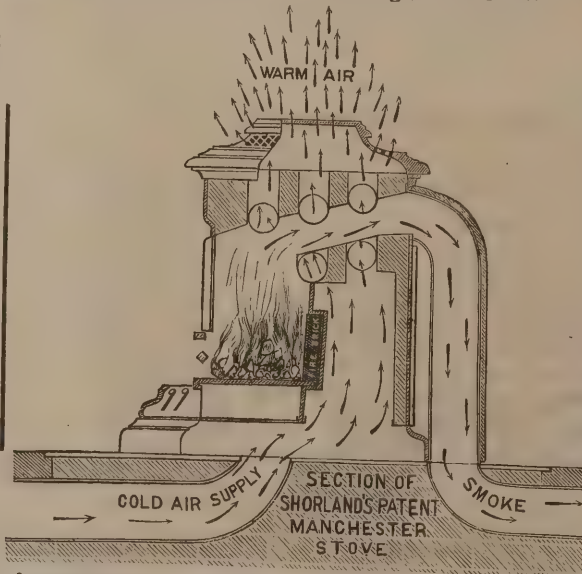
Mr. Armour, of Gateshead, alluding to the movement which the Guild had volunteered to support with its corporate funds, said that in early days plumber's work partook largely of a decorative character, but now it was more utilitarian. Sanitation had made wonderful strides, and the plumber of to-day should be a man who could not only bend lead but who knew how it should be put in when it was bent. He should have some knowledge of chemistry, of hydraulics, and a great many other things, and it was to induce men to acquire the necessary qualifications that registration had been established. For the younger members of the trade the establishment of technical classes would be encouraged. One of the objects of the meeting was to elect representatives to the district council. The number for Carlisle would be nine, of whom three would be elected by the public, three by the master plumbers, and three by the operatives.

Mr. Crowder said he had attended in London last year, and had then heard sufficient to convince him of the importance of the work in hand.

Mr. C. J. Ferguson, architect, said that many of the

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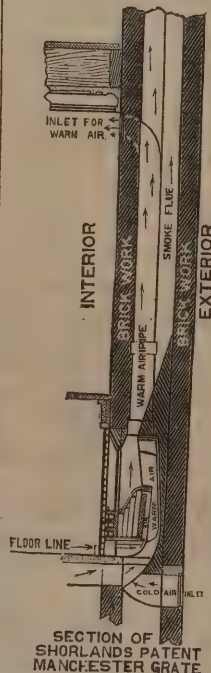
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plumbers in Carlisle were registered workmen and were as anxious as any one could be that there should be no work ill done. It was exceedingly desirable that the registration of competent men should become general.

Dr. Barnes said that one of a doctor's functions was to prevent disease, and in that he would be helped by the present movement. Plumber's work, being covered up, was often scamped; but he believed it was imperfectly done from ignorance rather than design.

Mr. Armour mentioned there were about 4,000 plumbers registered throughout the country, and that architects were beginning to stipulate that only registered plumbers should be employed. He added that candidates for examination, who passed with honours, gained the Freedom of the Plumbers' Company.

The meeting then appointed representatives, and the Mayor distributed certificates granted by the Plumbers' Company to the following operatives of the city:—James Routledge, John Blair, John Routledge, John Graham, and William Brown.

#### WINDOW-CLEANING ACCIDENTS PREVENTED.

MR. W. YOULTON has invented a simple and inexpensive form of sash-fittings which, when applied to ordinary sliding sashes, enable the windows to open inwards for the cleaning or painting of the outsides without necessarily removing any flowers from the sills. The patent "Accident-preventing" sliding sash-fittings may be fixed in a few hours by an average handy man with only very slight interference with the wood-work and to any size window. Their general adoption will obviate the lamentable and frequent fatal accidents attending outside cleaning. The cleaning difficulty is solved in a remarkably simple and practicable manner, without additional draughts or detrimental strains. We recommend our readers to test the merits of the invention for themselves. Messrs. Lloyd & Co., 37 Great James Street, Bedford Row, W.C., are the sole agents at present, but arrangements are pending for the supply of the fittings in complete window sets by all iron-mongers. Mr. E. R. Robson, architect to the Education Department, has highly approved of the invention, and has adopted it for the Queen Anne's Mansions extension, of which he is architect, and also for the application of the fittings to all the windows in the existing building.

#### MESSRS. W. SCUPHAM & SONS.

AMONG the industrial establishments in the North lately visited by us is that of Messrs. W. Scupham & Sons, of Leeds, which was recently referred to in *The Architect*. Messrs. Scupham & Sons are timber and mahogany merchants, manufacturers of all kinds of moulded and cabinet work. The firm has lately issued a new illustrated catalogue under date of November 1, 1888. First are illustrated several mirrors in best English gold frames, varied in character and detail. Next come overmantels, so much in favour now, on the shelves and ledges of which nick-nacks and curios can find place. These are followed by gold mantel-glasses in differently designed frames. The black and overmantel glasses are characterised by taste in the samples illustrated. Looking-glasses for toilet purposes, cheval glasses, &c., are given in much variety, and then come sundry little specialties in the way of hang-up glasses, ovals, lavatory, and bath-room glass. Moulded cornice poles, straight and angular, and such like fittings, are also introduced, with articles of furniture of everyday kind. The wood mortice door furniture, such as knobs for door handles, are made in oak, ebony, and partridge wood—these are Longbottom's patent adjustable door furniture, of which Messrs. Scupham & Sons are the sole makers for the North. They have been used by Her Majesty's Board of Works, and also secured the gold medal at the Royal Jubilee Exhibition held at Saltaire last year. The firm have again lately extended their works, absorbing an adjoining estate, containing over 1,000 square yards, on which are four rooms 92 feet in length. In addition to the above, they have opened a commodious wharf near Crown Point Bridge, with a frontage to the river of 180 feet. These are fitted up with new and specially designed machinery for the sawing and working of timber. Overhead is a travelling crane, running the entire length of the yard and partly over the water, for landing logs from the boats and conveying them to the different tiers. In Saxton Lane are the drying-sheds, and at a distance of a minute's walk is the manufactory in Mill Street. In the turning-room the lathes are seen at work, square turning being also carried on extensively. In the picture-frame department are lengths of mouldings in gilt, walnut and gilt, black and gilt, bronze, silver, oak, maple, rosewood, &c. In an adjoining room is the machinery for converting them into frames. There is a picture store-room, and in another large room are men engaged in the

## Wilson's Patent Dioptrical Pavement Lights.

WILSON & CO. beg to call the attention of Architects and others to the superiority of Wilson's Patent Dioptrical Lenses for pavement and floor lights. These Lenses are constructed on strictly scientific principles, and have been approved by some of the highest authorities on Light. They are made of the Best English White Flint Glass of high refractive power, and transmit more light than any other form of Lens yet introduced. The reflecting surface being spherical, the rays of light are distributed in every direction.

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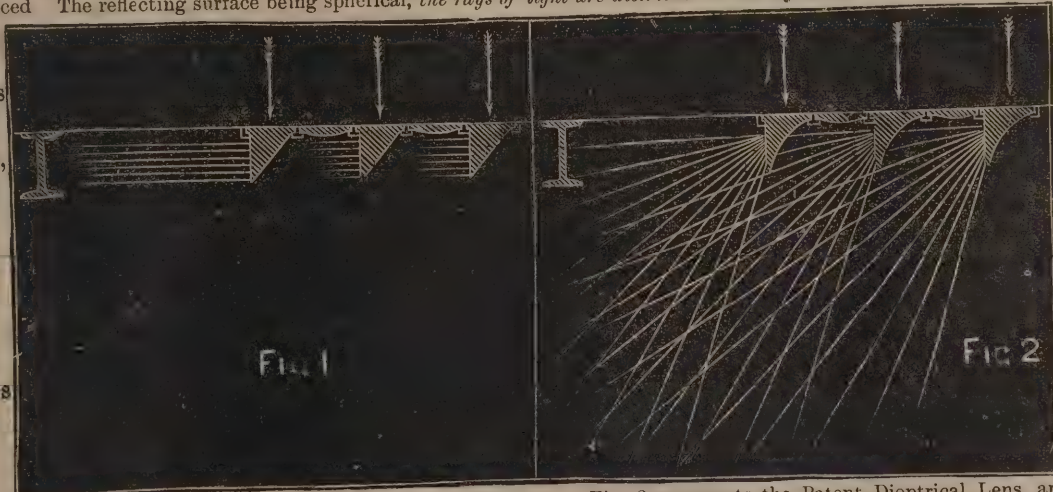


Fig. 1 shows the ordinary prism or semi-prism, by receiving the rays on a plane reflecting surface, throws them forward at one angle only, in parallel lines close to the ceiling.

Fig. 2 represents the Patent Dioptrical Lens, and shows by comparison how the rays of light, striking on the curved inner surface, are reflected forward through the face of the lens in every direction, filling the whole angle of 90°, thus illuminating the apartment from floor to ceiling and from wall to wall.

From the above diagram it will be seen wherein consists the advantages claimed for Wilson's Patent Lenses. The objection to the semi-prism is that it reflects the light, as shown in Fig. 1, at such an angle as to be of little use, and more especially if the line of the ceiling is below the line of the pavement; then the value of the semi-prism as a light projector is entirely lost.

It will be seen also, on reference to the above diagrams, in Fig. 1 that the first row of semi-prisms obstructs the rays of light from each succeeding row, whereas in Fig. 2 the bulk of the rays of light are projected at such angles as to pass unobstructed into the room.

The correctness of these illustrations can be practically demonstrated to any architect desirous of testing them.

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manufacture of toilet and mantel-glass frames. In the finishing-room the glass-cutters are at work, supplying the sizes required, the fitters putting them in the frames and adding the backs, after which they are passed on to the packers. In a workroom near by a number of women are busily engaged in polishing knobs, rings, spindles, cornice poles, &c.; others are finishing mouldings and different articles of furniture. A visit would hardly be complete without an inspection of the various stock and showrooms in the establishment. Mr. Scupham, senior, the founder of the business, is still the presiding genius of the establishment, besides being well known as a town councillor, and having taken great interest in all public affairs connected with the town for many years past.

#### AN ELECTRIC TRAVELLING CRANE.

THE application of electricity to the working of cranes has been increasing of late. Perhaps the first practical use of this agent for lifting purposes was the electric hoist of Dr. J. Hopkinson, exhibited at the Paris Electrical Exhibition of 1881. Since then it has been applied to hotel lifts and cranes, but not to any great extent. Quite recently, however, an electric crane of great power was described by Mr. W. Anderson at the Bath meeting of the British Association; and another large travelling crane, worked entirely by the electric current, has been introduced into the well-known timber-yard of Mr. Herrmann, at Limehouse. This crane has been adopted to avoid the insurance rates required for steam-cranes, which are obviously dangerous in a wood-yard. It has been designed by Messrs. R. E. Crompton & Co., of Chelmsford, and is found to do its duty very satisfactorily. Hydraulic power might have been used for the crane, but there was already an electric plant for lighting purposes on the premises, and hence electricity was adopted. The new crane runs on a tramway along the roof of the timber warehouse, and is used to raise the incoming logs of timber from the canal. An electric motor is attached to the frame of the crane, and geared with friction gearing of the Raworth type to a central shaft, which, by means of three levers and a foot-brake, performs the three operations of hoisting, slewing, and propelling the crane. The current is conveyed to the electric motor by two copper tubes, laid along the tramway, and taken off suitable contacts. In other respects the crane is of the ordinary build. The power is derived from an 18-unit Crompton

ton dynamo, which also supplies 300 incandescent lamps employed for lighting one of the factories. It gives a current having an electromotive force of 110 volts; and some 30 amperes are used to work the crane. It was specified that the crane should lift 15 cwt. as a *maximum* load, raise 10 cwt. at a speed of 80 feet per second, and slew at the same speed; but, as a matter of fact, it can lift 18 cwt., and in other respects the specification values have been improved upon.

#### CIRCUS BUILDING.

AN action has been decided in the Court of Session, Edinburgh, in which Mr. A. Stewart, builder, of Dundee, sought to recover 1,718*l.* 12*s.* 7*d.* from Mr. Newsome, the circus proprietor, as balance of an account for erection of a new circus in Edinburgh. From the evidence it appeared that Mr. Stewart was instructed in September or October last to build the circus, and it was represented to him that it was of great importance that it should be ready for occupation before the end of December or the New Year holiday season, and that he pressed on the building operations and had the circus so far completed as to get it licensed and ready for occupation within the desired time. The account for preparing plans, obtaining the authority of the Dean of Guild Court, and for erecting and furnishing the circus, amounted to 4,718*l.*; and he had received 2,000*l.* and a bond for 1,000*l.* over the property. The action was opposed on the ground that the work was performed under a contract by which it was a condition that the circus should be ready for occupation during the New Year holidays; that the price, including furnishings, was 2,700*l.*; that the 300*l.* over that sum which had been paid amply covered any additions or alterations; and, besides, that any addition or alterations were made on the builder's own responsibility and without instructions.

According to Mr. Newsome, his circus in Nicholson Street was burned down in September 1887, and Mr. Stewart, who was then employed by him to build a circus at Bradford, applied for the job of rebuilding the Edinburgh one. He agreed to give him the work of rebuilding it upon a plan similar to that of the Bradford one, and Mr. Stewart undertook to have the necessary plans prepared for the Dean of Guild Court, and to construct the building in accordance therewith, including the necessary fixtures and decorations, in time for the holiday season, for 2,000*l.* Plans were submitted to the Dean of Guild

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#### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIR.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. O. LOWE & SON, House Decorators, 33 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIR.—In reply to your inquiry, we, as one of the contractors for the painting Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly, S. O. LOWE & SON.

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Court on October 27, but they were not passed till November 17, and that on certain conditions which were agreed to by plaintiff on his own responsibility without consulting him; and during the progress of the work plaintiff never intimated any additions. Mr. Stewart intimated on November 8 that he had made three plans, so as to suit the Dean of Guild Court, the Surveyor and Firemaster, and adjoining proprietors, and that he would require 2,500*l.* To this Mr. Newsome replied that he would give 2,700*l.* if finished in time for the holidays; and this sum and more has been paid, and he does not admit any extras. In answer, Mr. Stewart denied a contract for 2,200*l.*, and said that the character of the building was entirely changed after the 2,200*l.* was referred to, and that the change was very much to increase the expense. Both the public authorities and neighbouring proprietors insisted on these changes, which involved among other things the substitution of iron for wood, and the providing of additional exits and other precautions for the cases of fire occurring. The defendant was aware of these matters at the time, and that it would not be possible to reconstruct the buildings without expending much more than 2,200*l.* Defendant, after the plans had been prepared, instructed plaintiff that he wished the building to be such that it might be used as a music hall as well as a circus, and this added largely to the cost; and it was quite understood by all parties that the cost of the work so altered would be much above 2,700*l.*, and that plaintiff was to receive much more.

Lord Fraser, in giving judgment, said the question was whether the plaintiff contracted to build a circus for the sum of 2,700*l.*, and if he did not do so what sum was due for building it. The main difficulty arose from the discordant evidence of two persons, who he believed honestly intended to tell the truth according to the best of their recollection. The pursuer and Mrs. Newsome were hopelessly at variance as to a conversation which they had at Bradford as to the conditions on which the circus was to be built. Evidently they had not understood each other. Their letters and telegrams showed that they both laboured under difficulties of grammar and spelling, and it was evident that they did not express themselves with that precision which the circumstances required. Mrs. Newsome wanted the circus built speedily and cheaply, and the plaintiff said he would do his utmost to oblige her, and this was translated by her to mean he would build the circus for 2,700*l.*, a sum that had been named under totally different conditions from those under which the circus was actually built. Mrs. Newsome was anxious to have the circus opened by the New

Year, and plaintiff was anxious to have it completed, and put much energy into it. Objections were taken in the Dean of Guild Court, and new plans had to be got. As the burgh engineer said, there had been a kind of panic owing to the Exeter disaster a short time before, and more was required than would otherwise have been necessary. The rejection of the plans of November 10, his lordship said, brought matters to a crisis. Plaintiff went to Bradford, and, according to his evidence, he told defendant that the building could not be built for 2,700*l.* or 3,000*l.*, and the defendant agreed to pay whatever sum was necessary to build the circus by the New Year. On the other hand, Mrs. Newsome said that no agreement was come to, and there was no conversation about the price. The Court must decide between these contradictory statements. The Lord-Ordinary could not hold that there was a contract to build the circus for a specific sum as it was ultimately built. The building, according to one witness, was the quickest job he ever saw done; and he had been 50 years in business. Pressed by Mrs. Newsome to enable her to earn 1,000*l.* during the New Year holidays, which she described as their harvest, the plaintiff hurried on his operations without making those prudent arrangements with sub-contractors which he would have made if he had been acting under a specific contract. Plaintiff, must, therefore, be paid for the work and labour done and the material supplied, and the only course was to see what was a reasonable sum. Plaintiff had been paid 3,000*l.*, and claimed in all 4,718*l.* 12*s.* 7*d.* Now, if the defendant paid that sum he would get value for the money; the circus had been leased for three years at a rent of 1,300*l.* a year, and that was an excellent return. The building being fireproof it could be insured at a reasonable rate. His Lordship quoted the evidence of Mr. Barton, a professional witness, who stated that plaintiff's prices were reasonable, and seemed to be very fair, taking into consideration the short time in which the work had to be done. The building was up to the price charged; and the result was that he must give decree for the sum sued for, with expenses.

ROYAL PRINCESS'S THEATRE, LONDON.—The Christmas bill of this theatre will include the production at daily matinees, except Saturday, of "Oliver Twist," in which drama Miss Grace Hawthorne will appear as Nancy Sykes. These matinees will commence on Monday, 24th inst. "Hands Across the Sea" continues in the evening bill.

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## CITY OF LONDON COLLEGE.

ON Thursday, the 6th inst., a visit of the Science Society of this college to the Millwall Docks was arranged by Mr. Henry Adams, M.Inst.C.E., who accompanied the members. Mr. F. E. Duckham, the engineer to the Dock Company, met the party at the railway station, and was most assiduous in showing and explaining the many interesting details with which the Dock abounds. Among the points noted were some economically built sheds with compound iron and wood roof trusses, and other very light galvanised roofs of 60 feet span. When first opened the Dock was fitted with fixed hydraulic cranes on the quay; these have been supplemented by portable hydraulic cranes, which are found much more convenient, and they have since been largely adopted elsewhere. The arrangement of the pipe mains was explained, and the method by which a breakage at any point could be shut off by means of stop-valves, so as to permit the machinery at other parts to continue working. Branches at intervals allow connection to be made with the portable cranes, and the telescopic pipes provided give a considerable range of movement. The grain machinery was next inspected, with the automatic weighing gear and self-emptying buckets, and Mr. Duckham's pneumatic apparatus for discharging mud from the dredger barges was seen in operation. Much interest was taken in the hydraulic engine-house and the various pumping apparatuses, which were fully explained to the visitors. To prevent damage to the engines an ingenious self-acting relief-valve is used, by which a large area is opened to allow the pressure-water to flow back into the tank when the accumulator reaches the top of its stroke, and the draught of water from the main is suddenly reduced. The graving dock was fortunately empty, so that its construction could be seen, together with the flat-sided caisson at its entrance, a large ship being on the blocks in course of scraping and painting; and the noted 75-ton shears, by Messrs. Day & Sumner, of Southampton, were observed with some interest, owing to that subject having been set for the home work of students in machine construction at the last May examination of the Science and Art Department. By the courtesy of Messrs. MacDougal, their extensive wood-fibre paper-making plant was next seen in operation, from the arrival of the spruce fir logs at one end to the packing of the bales of finished paper at the other. The whole of the processes were in full swing, but an intimation was given that the visit was considered to be "private and confidential."

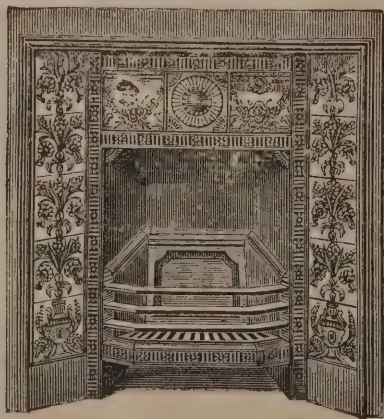
Before separating, Mr. Adams proposed a vote of thanks to Mr. Duckham for his kindness in allowing the members to visit the Docks, and especially for the trouble he had taken to explain everything likely to interest them. Also to Messrs. MacDougal, as the members who were unable to accompany the party certainly missed a treat in the unexpected addition of their works to the programme. Mr. Duckham, in replying, said he had not shown half there was to be seen, and he would be happy to meet the Science Society again to show them the remainder. This offer was fully appreciated, as the swing and drawbridges, dock gates, capstans, &c., could not be inspected, owing to darkness setting in. After partaking of Mr. Duckham's hospitality, the members returned to town, "sad" that winter days should be so short, but decidedly "wiser" than they set out.

## ENGLISH TRADE WITH NORWAY.

THE report of Acting Consul-General Hearn on the trade of Norway in 1887 states that the most noteworthy fact, from a British point of view, is the elevation of Great Britain to the first place in the value of the imports, a position which has hitherto been held by Germany. Although the surplus over the imports from Germany is only 23,000*l.*, or 4 per cent. of the total imports, still, in all previous years the balance has been very much the other way; and, at a time when the trade of Germany is being pushed to its utmost, and the competition with England is so great, it is satisfactory to find that the trade of Great Britain with Norway more than holds its own. At the same time, the imports from Great Britain increased by 50,000*l.*, or 1 per cent. of the total imports over 1886; while the imports from Germany decreased by 172,000*l.*, or 2 per cent. of the total. With regard to the exports, Great Britain took 31,000*l.* more than in 1886, which was, however, a decrease of 7 per cent. on the total exports; while Germany took 55,000*l.* more than in 1886, an increase of 5 per cent. on the total exports. The total trade with Great Britain increased, therefore, by 81,300*l.*, or 3 per cent. of the total commerce, and that of Germany decreased by 116,000*l.*, or 1.1 per cent. of the total foreign trade of Norway. The value of metals imported in 1887 reached 537,000*l.*, of which 276,000*l.* falls on raw and half-worked metals, and 261,000*l.* on worked-up metals. Among the former are included 182,000*l.* for pig-iron, steel, bar-iron, and iron plates, of which 34,363 tons were imported, which is

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rather more than the average of late years. The import of pig-iron was 12,791 tons, or much more than the average of the ten years 1876-1885, which was 9,996 tons. The amount of bar-iron imported has been steadily increasing, and exceeded in 1887 17,032 tons, against an average of 15,663 tons for 1881-1885. On the other hand, the 3,650 tons of iron-plates imported were considerably less than usual.

SPANISH EXHIBITION, 1889.

ALL matters have now been definitely settled for holding a Spanish Exhibition next year at Earl's Court, upon the site of the late Italian Exhibition, when the president will be the Duke of Wellington, Grandee of Spain, and the vice-president, Colonel G. T. North. The most elaborate preparations are being made, and some very important arrangements have been entered into by the authorities. The Industrial Section of the Exhibition will consist of a magnificent display of the various manufactures of Spain and her colonies, whereby the public will be enabled to form some idea of the latent resources of the Spanish peninsula. A special selection of paintings and sculpture by Spanish artists, and representative collections of articles from the chief centres of the Spanish industry, including laces, Cordova leather, Toledo steel, Damascene ware, &c., will be included. Many descriptions of products will also be on view, including the raw materials, food stuffs, minerals, &c.; and a great feature will be made of the costumes worn in the different provinces. Spanish streets, villages, and shops will be erected and peopled by the men and women from the different districts, in their picturesque dresses. The process of manufacturing cigars from the tobacco leaf up to the finished article will be made a strong feature of, and last, but not least, ample provision is being made for the Amusements Section, always keeping in view the nature of the Exhibition. There will be daily exhibitions of bull-fights, with one very strong point, viz., without the accompanying cruelty usually practised. A large number of bull-fighters and assistants have been engaged, and a herd of Andalusian bulls will be imported. It speaks volumes for the energy displayed by the promoters of this Exhibition that they have been able to arrange for the exhibition of these famed bulls, as we understand none have ever been allowed to be taken out of the country before.

It is needless to say that music will be thoroughly well

looked after, several bands being engaged, including Spanish regimental bands, the Estudiantina band of guitars, castagnets, &c., and a troupe of dancers will be provided, consisting of men and women in their native costumes. A regular series of evening concerts will also be given, and ten noted players of the attractive game "Pelota" have been specially engaged from the Basque provinces. There will also be members of the Civil Guards in their attractive dresses, barbers in Figaro dresses, bandits in their picturesque attire, and various other attractions. It is anticipated by the authorities that the Exhibition will be open to the public about the middle of April next.

SANITARY SOCIAL PROBLEMS IN GLASGOW.

A MEETING of the Philosophical Society of Glasgow was held on the 5th inst, when Mr. John Honeyman, president of the Sanitary and Social Economy section, delivered his opening address for the session. Some years ago, he said, a good deal of harm was done by the late Dr. Farr's want of discrimination in dealing with statistics, which he (Dr. Farr), held, proved that the rate of mortality depended on the density of population. This seemed to confirm the erroneous theory which lay at the root of our own city improvement scheme, and against which he (Mr. Honeyman), among others, protested at the time of its inception, namely, that the dispersion of the population over a wider area was the best means of securing the proper housing of the poor. This view was at once superficial and fallacious. It was superficial because it ignored the fact—recorded in the report of the Royal Commission on the Housing of the Working-classes—that the root of the evil was to be found in "the poverty of the poor." That was the depth below the surface which we must reach if we were in earnest; a depth so dark, so mysterious, so beset with difficulties as to bid the boldest pause. It was fallacious because it attributed to density of population a result due to concomitant but absolutely independent causes. There was, in fact, no necessary connection between density of population and a high death-rate. Dr. Russell brought them much nearer the truth when he showed them the connection between small houses and high death-rates, although, as Dr. Russell himself acknowledged, even this only brought them a step nearer the real causes of mortality in crowded districts—poverty, starvation, vice, disease, and foul air in overcrowded, badly-planned houses. Nothing was more certain to aggravate all the evils which they at present deplored

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than the erection of dwellings for the working classes by the Corporation of Glasgow, and it was astonishing to him that shrewd business men, as the majority of the Town Council are, failed to apprehend the futility, and the danger as well, of attempting to banish inexorable economic laws to Saturn or anywhere else. They were not to be got rid of at pleasure, and when violated exacted the penalty surely and remorselessly. He had not a word to say against the buildings erected by the Corporation in the Saltmarket. He agreed with Dr. Russell in thinking them excellent of their kind. But some town councillors seemed to think that by the erection of these buildings they had done the ignorant architects and builders of Glasgow a good turn by showing them how to get up dwellings for the poor. Now, that was an absurd mistake. There was no difficulty in designing or building dwellings quite equal to these in every respect, but the plain fact was that no sane builder would do anything so foolish, even if he were in the lucky position of being able to borrow money at  $3\frac{1}{2}$  per cent. It might suit the Corporation to erect these buildings so as to occupy and bring back population to some of their vacant ground, but to the community, apart from its slight interest in the "common good," these buildings were absolutely of no use either as models or in any other way. Let them consider them a little—first, negatively—as old divines used to say—and, secondly, positively. Firstly, they are not dwellings for the poor. The Corporation, with all Dr. Russell's facts before them regarding the wretched condition of ticketed houses, their faulty arrangements, and lamentable death-rate, might have been better excused had they attempted to show by their building operations some practical way of meeting this gigantic evil. A model block, showing how this could be done in a way sufficiently remunerative to tempt builders to imitate it would have been of immense value, and could not have been objected to if the Corporation pledged themselves not to erect another. This would be more apparent when they considered, secondly, the positive aspect of their conduct. When the first block was erected it was to be a model, but, as they had seen, it turned out to be a model which no sane builder would dream of imitating, because it would not pay him to do so. In the face of that fact, the Corporation resolved to imitate it themselves, with no excuse except that they could make it pay sufficiently to satisfy them. It was evident that they thus entered directly into competition with the builder, in circumstances which put anything like fair competition out of the question. Now, unfair competition inevitably led to monopoly, and he knew nothing

which in the long run would prove more injurious to the working classes than a building monopoly. The Corporation were bound to consider not merely the immediate financial results to them, but also the consequences which must follow their driving the ordinary builder from the field, in the shape of scarcity of house accommodation and increased rents; and they might depend upon it that a continuance of their present policy would surely lead to these results. At the annual meeting of the Kyrle Society the Lord Provost made some eminently sensible remarks on this subject, and also on one-room houses, which he cordially endorsed. If the Corporation really desired to benefit the working classes in this matter, their simple and only safe course was to give up building definitely, and to sell their vacant ground at prices which ordinary builders could afford to pay. But a much wider and more difficult economic question was suggested by the lamentable condition of the poor in all great cities, and in the country as well. He meant the great and interesting question of the better distribution of wealth. Except in so far as it contributed to this result, the better distribution of land was a matter of altogether secondary importance; but it seemed to appeal more directly to the popular fancy and interested demagogues, and certain sections of the press had therefore made the most of it. We really needed, and the need became pressing, something more radical still, something which would affect every class of society, from the highest to the lowest, and every variety of industry and commerce, in the way of regulating the distribution of wealth so that it would conduce to the greatest good of the greatest number. But it was well that we should ever remember that it was vain to expect that anything of this kind had the slightest chance of success if it either violated economic laws or in any degree discouraged individual enterprise. It could never be if either of these conditions were violated, and yet he ventured to express the opinion that the accomplishment of this great means of ameliorating the condition of the poorer classes was not impracticable. The more he thought of it the more he felt convinced that they must deal with poverty, the root of all grinding "sweating" slavery, not by diminishing the chances of the unhappy victims getting any employment at all, but by increasing those chances by the combined means of a greater diffusion of money and enlightened public opinion. There was nothing inconsistent in a keen Conservative favouring a Radical change in this respect; at all events, he regarded the claims of our terribly down-trodden poor as paramount, and his complaint against his Radical

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brethren in this case was, not that they went too far, but that they went astray, and belied their profession and their name by ignoring altogether fundamental principles. He need hardly point out that as they could not increase the wages of the poor by throwing difficulties in the way of their getting work, no more could they facilitate their better housing by providing them with dwellings which they could not afford to pay for. It was a strong conviction of this which had led him more than once to protest against the imposition of such restrictions on buildings as had tended to keep the land in Glasgow belonging to the Improvement Trust vacant, and hindered the erection of dwellings of the humblest class. They might be able to effect many improvements which cost nothing, and sanitary authorities in Glasgow and other large cities had done much commendable work in this way; but such interference must not be carried beyond the rigid limit he had indicated; it must not increase the cost of the dwelling, or we did our poor brethren far more harm than good. Under present social conditions, then, there were two things almost equally essential to the well-being of the poor—first, that they do not get better houses than they can afford to pay for at less than a remunerative rent; and, secondly, that nothing should be done by local authorities to diminish or hinder the supply of houses suitable to the circumstances of the poor, that is, so cheaply constructed that the poor can afford to pay remunerative rents for them. It seemed impossible to drive the economic fallacy out of some people's heads that they could burden landlords without burdening their tenants. He referred to a scheme adopted by Miss Octavia Hill, and said that if the Glasgow Kyrle Society adhered closely to that method they would succeed, but he feared they must aim at obtaining from their property more than 4 per cent. Miss Hill obtained 5 per cent. after paying all expenses, including the usual commission for factorage, and if that was possible in London there ought to be no difficulty about it here, and it would no doubt go far to insure the steady development of the greatly needed and most praiseworthy work. In conclusion, he referred to what had been called "the sewage problem," which had within the last few days been once more brought prominently before them by Mr. Young. Mr. Young's proposal was probably the best which had been suggested. It was in his opinion the best non-precipitation scheme, but he must not discuss it now. It did not come under their notice because they were the sanitary section, but entirely because they were the social economy section. It was, in short, purely an

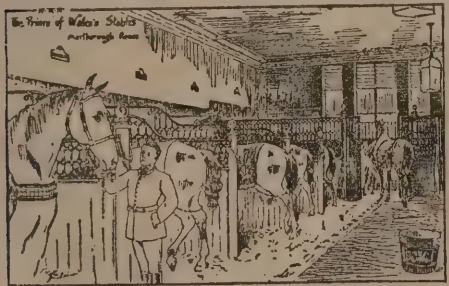
economic problem. It was thirty years since, in a paper read before the Architectural Society, he endeavoured to convince his fellow-citizens of this same fact, but during all these years proofs of the fact have been accumulating. Notwithstanding the enormous increase in the quantity of sewage thrown into the river, the death-rate of the city had gradually fallen from something like 35 per 1,000 to the very satisfactory rate of 17. In view of these facts, it appeared to him to be perfectly absurd to say that the general health of the community was affected by the condition of the river. Why, then, should the citizens be asked to pay a large sum of money for its purification? Only one satisfactory answer to this was possible, viz., that the operation would be remunerative—that we would thereby turn our sewage to profitable account instead of wasting it. But how did the matter actually stand? According to this very reasonable and economical scheme of Mr. Young, the ratepayers of Glasgow would be saddled with an annual deficit of upwards of 44,000*l.* And who were the ratepayers? He need not remind them how large a proportion of the rates in Glasgow came out of the pockets of the working-classes. It was they who would have to pay the greater part of this sum, for which they would get absolutely nothing in return. In contrast with that result, only imagine what 44,000*l.* per annum might do for us if we left "the sewage problem" unsolved. Five years of it would solve several other problems in which the working-classes were very much interested indeed. They would give us a respectable library, a museum, a school of art, a technical college, and another park—substantial and permanent advantages, in the enjoyment of which the five years of heavy taxation would soon be forgotten. The economist—and especially the social economist—must be satisfied that he got full value for what he spent, and when a proposal to spend so large a sum as 44,000*l.* per annum was made, there should be no difficulty in stating categorically the benefits which were thereby to be obtained. Health was not one of these—what was? It could surely be specified and appraised. He had searched for it in vain through all that had been said or written on this subject. They would all, he dared say, like to see at Stockwell Bridge the salmon running up in the pellucid stream as of old, and the fisherman playing his craft at Glasgow Green; but nine-tenths of the ratepayers never saw the Clyde; and even now it was not the domestic sewage which kept the salmon out, nor had we by any means done all that was possible to prevent pollution.

On the motion of the President, a cordial vote of thanks to Mr. Honeyman for his address was agreed to.

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cretonne, chintz, dimity, or any other suitable covering to correspond with the surrounding drapery of the room. The cosy corner from which our sketch is taken had all the visible wood-work painted and enamelled white, although they are made sometimes of hard wood and polished, such as mahogany, walnut, &c., or they can be ebonised, if desired, to correspond with the rest of furniture in the room. For large rooms, where the distance between the fireplace and the corner of the room is too great for one of these cosy corners to be fitted as shown in our illustration, they are made to stand in any suitable corner, and are fitted with two ornamental end standards instead of one, the additional one being fixed where the chimney breast is shown in sketch. The ornamental work above the back cushion is the Lincrusta work for which this firm is so celebrated, and is treated in the same manner as the woodwork—*i.e.* either enamelled or decorated to correspond with polished

placing them within the reach of any of our readers. We would strongly recommend any one to write for full particulars, or call at the Lincrusta showrooms, 19 Old Cavendish Street, Oxford Street, W., and see these novel and artistic pieces of furniture. Another advantage this article has is that people who have a country house as well as a town one, can, when moving from one to the other, pack up the cosy corner, and in as few minutes fit it up in the house into which they are moving.

## THE SALISBURY ESTATE IN THE STRAND.

THE mode of laying out the Salisbury Estate, off the Strand, which the Marquis of Salisbury was recently able to dispose of under the Settled Estates Act, has just been decided by the



new freeholders. The estate comprises the whole of Cecil Street and Salisbury Street, which will be entirely absorbed under the plans about to be carried out; also the low-lying land between the south ends of those streets and the gardens of the Thames Embankment. It appears that many rival schemes have been proposed for laying out the estate, but the idea of retaining the privacy of the property has found most favour. One of the schemes proposed the retaining of the streets and merely rebuilding the houses, but the one which has been adopted provides for dealing with the site as a cleared one. In carrying out the undertaking the general idea of the Adelphi and its substructures has been agreed upon as the principal feature of the scheme. A plateau level with the Strand, over the whole area of the site, will be first constructed, having beneath it, and forming the substructures of the buildings to be erected over, a storey about 35 feet high, entered on a level with the Embankment, and altogether distinct from the Strand level. The plateau over this is proposed to be laid out as a square, entered from the present Cecil and Salisbury Streets, and surrounded by the several buildings to be erected. This square will be altogether private, and closed by gates at the entrance from the Strand. At the southern end a theatre is to be erected, drawings for which are now before the Board of Works. There will also be an hotel, with entrances to it on both the Embankment levels, there being restaurant accommodation on the lower level of the hotel. Messrs. J. W. Hobbs & Co. are the purchasers of the freehold from the Marquis, and Messrs. Perry & Reid are the architects. They have already designed a palatial building of six storeys, which is to be erected on the plateau, having its frontage overlooking the river and the Embankment gardens.

## PATENTS.

*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]*

## APPLICATIONS FOR PATENTS.

17446. George Humphrey, for "Improvements in weather bars and thresholds for doorsteps." November 30, 1888.

17452. Frederick William Jones and Alfred Thomas, for "An improved blind-cord holder." November 30, 1888.

17457. Hildebrand Henry Oakes, for "Improved soap and sponge tray, to be used in connection with a bath." (Complete specification.) November 30, 1888.

17502. Samuel Fisher and William Edward Fisher, for "Telescoping or collapsing handle for doors, cupboards, safes, and windows." December 1, 1888.

17525. Burton Richard Phillipson, for "Improvements in the ventilation of drain and soil pipes." December 1, 1888.

17570. Jesse Carpenter, for "Improvements to sliding sash-windows." December 3, 1888.

17578. Samuel Augustine de Normanville, for "Improvements in taps, cocks, or valves." December 3, 1888.

17583. Julius Frederick Moore Pollock, for "Improvements in machinery for moulding and compressing blocks of coal-dust, clay, cement, or similar material, with or without agglomerates." December 3, 1888.

17609. John Brown, for "Improvements in apparatus employed in the manufacture of gas and for prevention of stoppages in pipes." December 3, 1888.

17612. Urban Armstrong Smith, for "The sewerage of districts, towns, and places," to be called "The Urban Smith siphon sewerage system." December 3, 1888.

17620. William Preston, Campbell Everden and Edward Taylor, for "Improvements in the means and modes of collecting the laths of venetian blinds." December 3, 1888.

17641. John Ogg, for "Improvements in cutting and dressing stone and other hard substances, and in apparatus therefor." December 4, 1888.

17654. Albert Green, for "A gulley for streets, or any purpose for which it can be used." December 4, 1888.

17730. Clarence William Crossley, for "Improvements in the arrangement of propellers or their equivalents, for use as fans, air-propellers, and similar apparatus, for moving air fluids and gases for ventilating and other purposes, and in the manner of revolving such apparatus." December 5, 1888.

17731. Joseph Edward Aykroyd, for "Improvements in, or appertaining to, the ash-pits of domestic fire-grates." December 5, 1888.

17739. Hermann Marx Cornelius, for "Improvements in lock or fastener." December 5, 1888.

17752. William Millar, for "Ventilating boarded floors where the outside ground or pavement is level with or above

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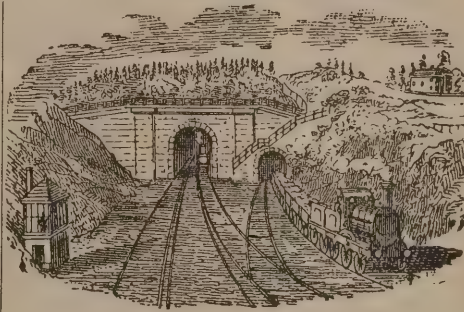
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the said floor, called 'Syphon floor ventilator.' December 5, 1888.

17796. William Roberts, for "Improved method of hanging window-sashes." December 6, 1888.

17816. Francis Joseph James Gibbons, for "An improvement in asylum mortice locks, applicable also to other kinds of locks for asylums and other purposes." December 6, 1888.

17817. Robert Batey, for "An improved window sash-fastener—self-acting." December 6, 1888.

17823. John Carter, for "Improvements in land and marine water-closets, by means of a valve or valves, and the mode of working the same." December 6, 1888.

17836. Charles Edgar Winton, for "An improved T-square for constructing equidistant and parallel lines." December 6, 1888.

17839. John Cole, for "An improved ventilating sash-fastener." December 6, 1888.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

3695. Richard Roberts, for "Improved chimney-pot." March 10, 1888.

13694. James William Broadey, for "Improvements in water-waste-preventing syphon cisterns." September 22, 1888.

14746. John William Youngson, for "Improvements in sash-fasteners." October 13, 1888.

15271. William Thomas Leach and Charles William Julius Notte, for "A combined rule, set-square and section liner, for draughtsmen and others using drawing instruments." October 24, 1888.

15586. Robert Bearpark Lyon, for "A machine for moulding bricks." October 30, 1888.

15610. John Rothwell, for "A new or improved apparatus for ventilating." October 30, 1888.

16973. Arnold William James Swindells and William Sydney Peel, for "Improvements in apparatus for raising, lowering, balancing, and holding in position carriage, railway carriage, and all other windows, shutters, and similar contrivances, without the aid of cords or chains and pulleys." November 22, 1888.

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#### COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office on the prescribed form of such opposition.

381. Henry Romain, for "A method of applying curtains, to prevent draughts, to doors in rooms and dwelling-houses and other buildings." January 10, 1888.

1442. William Baird, for "Improvements in means or apparatus for flushing water-closets and urinals." January 31.

1490. George James Williams, for "Improvements in the manufacture of grooved and other window brackets and their sockets." February 1, 1888.

1717. Pawley Clark, for "Improvements in fire-stoves for preventing down-draughts in chimneys." February 6, 1888.

2955. Archibald Henry Ford and Elias George Wright, for "An improved self-ventilating sewer pipe and system of sewer ventilation." February 28, 1888.

10447. William Parkes and Charles Wakeman, for "An improved sectioning set-square for drawing equidistant parallel lines in any direction of variable pitch." July 19, 1888.

#### PATENTS SEALED, DECEMBER 7, 1888.

10361. John Philipps, for "Improvements in the ventilation of sewers." July 25, 1887.

14755. John Lewthwaite, for "Method of constructing breakwaters, groins, moles, sea-walls, foundations for lighthouses, coast defences, and other like works." October 29, 1887.

15327. Max Am Ende and Alexander Buchanan, for "Improvements in iron and steel flooring for railway and other bridges." November 9, 1887.

15509. Richard Oakley, for "Improvements in apparatus for warming and ventilating buildings." November 12, 1887.

16867. Willey Greenwood, for "A fuel economiser for use in domestic fireplaces." December 8, 1887.

3708. Robert Bristowe Lee, for "Improvements in the manufacture of material for use in the construction of fireproof curtains for theatres, fireproof ceilings, walls, columns, partitions, panelling blocks, slabs, girders, doors, floors, roofing, safes, strong-rooms, and other analogous parts, structures and buildings intended to be fireproof." March 10, 1888.

9338. William Boutton, for "Improvements in the method of a machinery or apparatus for grinding or pulverising flint and other substances." June 26, 1888.

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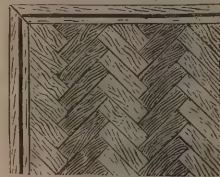
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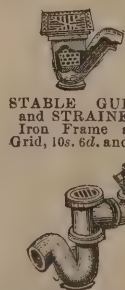
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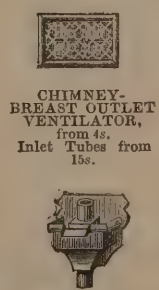
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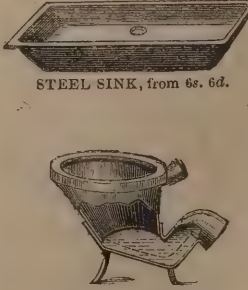
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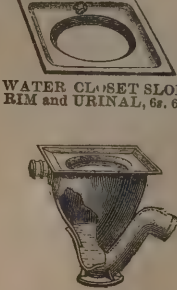
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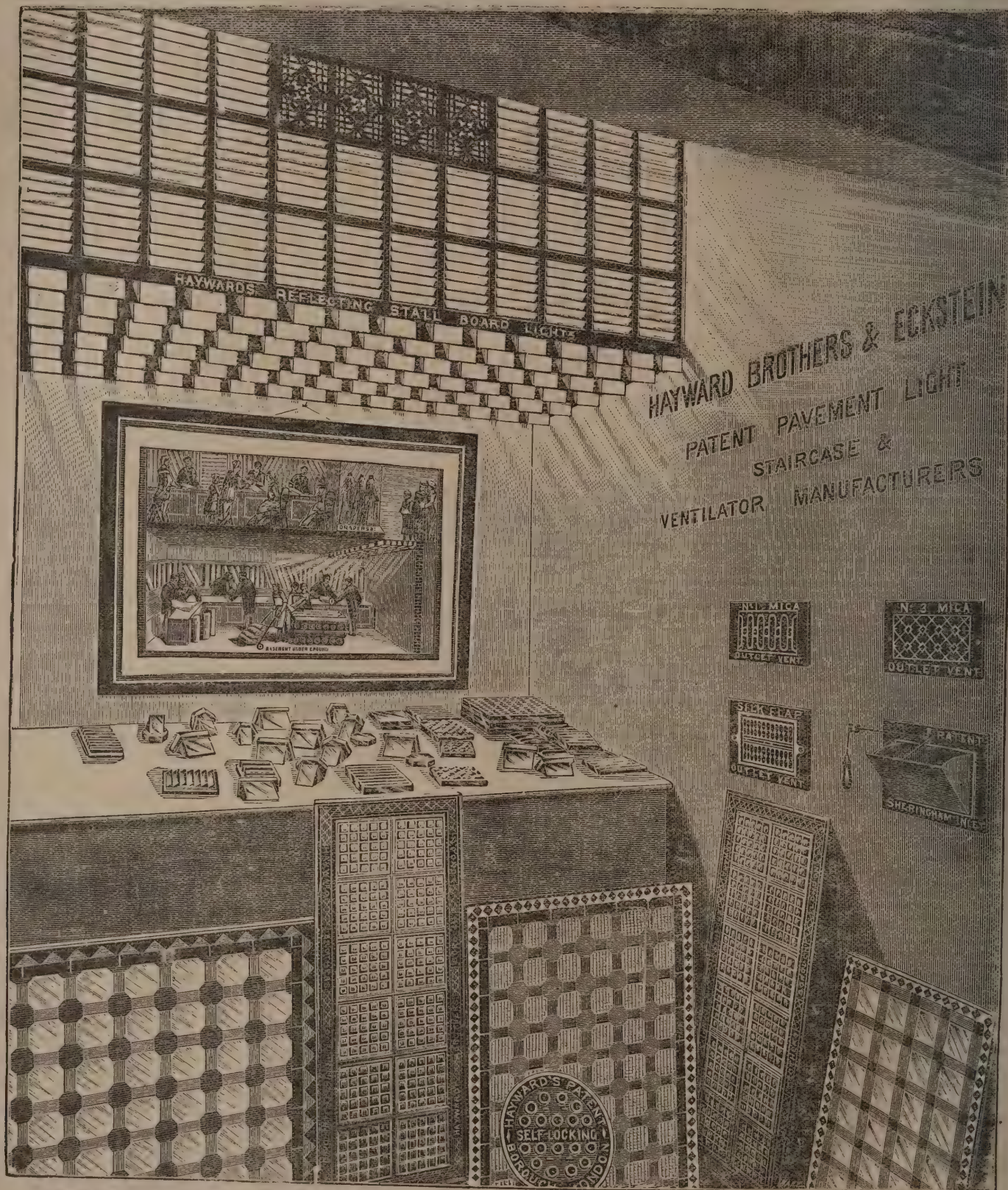


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 Friday, December 14, 1888.



# The Architect.

## THE WEEK

THE buildings on the Champ de Mars which are assigned to the section of the fine arts of the International are found to be inadequate for the number of works which will be exhibited. M. FORMIGÉ has prepared plans for additions, and no time must be lost about the works if the new galleries are to be ready for the pictures which are about to be sent to Paris.

IN selecting Messrs. SHANNON, PICKERING, and KENNINGTON as members, the Institute of Painters in Oil Colours have recognised three able artists. Unless he is spoiled by praise and patronage, Mr. SHANNON should be among our foremost portraitists. Mr. KENNINGTON has mainly painted as if art were a handmaiden to the Charity Organisation Society, but can hardly fail to find subjects which are better adapted for so much grace as he can impart. Mr. PICKERING may also be expected to justify the choice of his fellow-members.

THE late Mr. RICHARD REDGRAVE, R.A., could hardly be called one of the great masters, but his work during thirty years for the promotion of art training in England deserves to be remembered. When he helped FELIX SUMMERLY in making designs for all sorts of things he risked much, for the experiment was understood by no more than a few people, but he demonstrated that he knew something about what was then called "practical art." It was a recognition of that skill when he was asked to report upon Industrial Design, as it appeared in the contents of the Exhibition of 1851. When the Government took up the teaching of art on a large scale he was called in. There were few artists who would undertake co-operation with a dictator like HENRY COLE, but Mr. REDGRAVE worked harmoniously with him for a very long period. He was not a genial director of art schools, but he had the credit of impartiality, and the most distant school was treated by him in the same way as the Training School. He had fixed notions about the limits of art when applied to manufacture, but now they are not generally accepted as canons. As a figure-painter he preferred subjects like *The Governess*, but if he had kept to landscape, we fancy that his name as an artist would now stand higher.

THE election of the council of the Société Centrale des Architectes has taken place with the following result:—President—M. CHARLES GARNIER. Vice-Presidents—M. A. NORMAND, M. E. DE JOLY. Principal Secretary—M. EUG. MONNIER. Associate Secretary—M. ED. LOVIOT. Assistant Secretary—M. F. ROUX. Archiviste—M. G. RAULIN. Treasurer—M. SIMON GIRARD. Censors—M. BAILLY, M. DAUMET, M. ACH. HERMANT. Delegates to the Council—M. BARTHAUMEUX, M. P. WALLON, M. DESLIGNIÈRES, M. HÉRET, M. JULIEN BAYARD, M. GUADET, M. SÉDILLE, M. JACQUES HERMANT, M. BONNET, M. EUGÈNE SAINT-PÈRE. The forthcoming year is an important one, and a good choice has been made of architects who will be able to represent the profession before the crowds who will meet in Paris.

THE annual distribution of prizes in the West London School of Art took place last Friday, the 14th inst., at the school in Great Titchfield Street. Mr. G. A. THRUPP, the chairman of the committee, presided, and was supported by Mr. SEYMOUR LUCAS, A.R.A., and Mr. G. A. STOREY, A.R.A. Mr. SEYMOUR LUCAS, in distributing the prizes, commented on the exhibition of students' works which, on the whole, he considered much above the average quality of work done in such schools, and he gave the students some useful hints as to methods of treatment for future guidance. He also bore eloquent testimony to the capability of Mr. JOHN PARKER, the new head-master, as a teacher. Mr. STOREY read an interesting paper on "Meissonier," whose life and works he cited as an example of perfection in art attained by unremitting care and attention to every detail consistent with a true study of nature. The committee having recently secured the services of Mr. JOHN PARKER, R.W.S.,

as head-master, have made other changes in the teaching staff likely to materially develop the efficiency of the school in future. There are now separate life classes for male and female students, as well as a special class for the study of flower-painting from nature, under the direction of Miss LOUISA AUMONIER, whose work is well known to the frequenters of our principal galleries, while the class for design is most ably conducted by Mr. M. COULSON. The school is within five minutes' walk of Portland Road Station. The "Mence Smith" travelling studentship, value 50*l.* (given by a member of the Painters Stainers Company for "colour decoration," and open to all the Schools of Art in London), was gained by Mr. JAMES WEST, while Messrs. WM. WOOL-LAMS & Co.'s annual prize for the "best design for a wall-paper" was awarded to Miss AMY WOODALL.

THE winter session of the Munich Academy of Painting and Sculpture has commenced this week. There are 356 students in the classes. Bavaria is represented by 131, the remaining German states by 105, Austria and Hungary send 73, and the balance of 47 students may be credited to the rest of Europe and America. The students can be classified in another way. The life classes are attended by 121, the painting classes by 117, the sculpture classes by 56, and composition and engraving have 62 students. The Prince Regent has nominated several artists as honorary academicians. Among them are Mr. WHISTLER, M. DAGNAN-BOUVERET of Paris, Herr ANGELI, the Court portraitist, and Herr SEIDL, the architect.

THE scheme of the Commissioners of the Exhibition of 1851 for the erection of houses on the south side of the Albert Hall does not augur well for the Indian Section of the South Kensington Museum. The examples of Indian art are unworthily housed at present, but it is better to be in wooden sheds than suffer an eviction with no better prospect than damp cellars. Up to the present the authorities have not appreciated Indian art. To visit the museum in the India Office one had to undertake a climb to the top of the building, and a day's study in the Indian sheds is likely to be rewarded by a chill. More should have been done to enhance the interest of the objects by means of a suitable building. Owing to Mr. PURDON CLARKE'S zeal the defects of the wooden buildings were minimised, and we have not met an officer in a Government department who was more ready to impart his knowledge of the things around him. Thanks to him, people are thinking more about Indian art than formerly. It will be a disaster if a stop is put to the excellent work which, after years of neglect, is now being done in the Indian Section.

THE Scottish Court of Session has recognised the distinction between an action taken under common law by a workman against an employer for compensation for injury, and one taken under the Employers' Liability Act. The circumstances were novel. In 1885 a workman was injured by the collapse of scaffolding, and he sought 1,000*l.* damages from Messrs. MORRISON & MASON, the contractors. With the object of gaining a large sum the action was not taken under the Employers' Liability Act. The jury, however, awarded only 200*l.* and costs. The contractor appealed, but the verdict was not altered. The costs amounted to 510*l.* 8*s.* 1*d.* It was partly to avoid an expense of that kind that the Employers' Liability Act was passed, and we are surprised, considering the amount awarded, that a lower scale of charges was not recognised. Messrs. MORRISON & MASON were insured in the Scottish Employers' Liability and Accident Assurance Company. They applied to the company for payment of 710*l.* 8*s.* 1*d.* disbursed, but the company declined any liability as the action was not brought under the Employers' Liability Act, and the contractors had not been paying the extra premium which is demanded in order to provide for claims under the common law. In this case also judgment went against the contractors in the first instance, and it was confirmed on appeal. The case is instructive, for it shows what is sometimes forgotten, that the Employers' Liability Act does not do away with the old course for obtaining damages, which, indeed, offers advantages to men who are dilatory in making claims against an employer.



## PROVENCE AND THE RIVIERA.—II.\*

THE buildings in Mr. MACGIBBON'S book which represent the post-Classical period may be said to consist of churches and castles. There are few houses to be found which can be called ancient until we come to the chapters on San Remo, Monaco, and Taggia. But the importance in the eyes of the author of the above period is evident when we say that the greater part of the book and nine-tenths of the illustrations relate to Transition and Mediæval works.

As we remarked before, the love of what was Classic always lingered in the district of Provence. It is seen not only in churches which might be taken for late Roman, but in the treatment of details. The pointed arch was employed at an early date in the district, but Mr. MACGIBBON says "it was limited to the vaulting, the round arch being preferred for all the ornamental parts of the architecture, and it continued to be so employed till the thirteenth century." Taken as a whole, Roman work may be called severe in spite of the occasional exuberance of the ornament, and severity obtained a new lease of life through the influence of the Cistercians. St. BERNARD, who was one of the law-givers of the Order, was indifferent to everything which could give pleasure to any of the senses. He brought himself into such a condition that he would not permit his eyes or ears or tongue to perform the ordinary functions for which they were given to us. His panegyrist, FLECHIER, says that St. BERNARD only lived in spirit, that he saw things like a blind man, listened like one that was deaf, and took food as if he were deprived of taste. The only created things he seemed to care for were the beeches and oaks of the forest, which he called his preceptors and masters. To a man like St. BERNARD architecture became a danger, and if he lived in our time his favourite temple would be probably one of corrugated iron or pitched boards. It is not plain how men could believe that their souls were safe if they worshipped in a church with square piers, while round columns with capitals marked the broad way to destruction. Evidently that sort of feeling towards architecture was sufficiently strong to compel the abandonment of details which had grown familiar to the people of the South of France. But nature is not to be resisted for ever. The Cistercians themselves felt that allowance must be made for the weakness of humanity, and they also encouraged the imitation of the flowers of the field as a means towards the beautifying of churches. In course of time a new impulse was also given to the architecture by the rise of artists who could practise the art. On this subject Mr. MACGIBBON says:—

The monks, who had hitherto been the sole possessors of the requisite knowledge and practical skill, had, by their schools, and by the guilds of tradesmen which they had encouraged, sown the seeds which were now springing up in a form they had not looked for, and producing a crop of lay artists who were soon to leave their old masters behind. The monastery system of carrying on everything according to rule had long held architecture in bondage. Under the new impulse all conventional rules were abandoned, and the artists trusted to the inspiration of nature for their guidance. Hence it followed that, whether in planning, in construction, or in ornamentation, the forms so long reverently followed by the architects of the monasteries were speedily dropped by the lay artists of the town, and a new art sprang up with the most marvellous rapidity. To the new school of artists nothing which would naturally and logically suit their requirements came amiss. The round arch was the traditional form of the ecclesiastics, but, the lay architects of the North finding (as the builders of the South had long previously done) that the pointed arch was more flexible and amenable to their requirements, forthwith adopted it. This enabled them to overcome what had hitherto been the great difficulty with the round arch, viz. to erect intersecting vaults over spaces of any form, whether square or oblong, and at the same time to keep the apex of all the vaults at any desired height. The transverse arches and the wall arches being thus pointed soon led in the most natural manner to the window arches within the latter being also made in a pointed shape, so as to conform to the outline of the wall arch, and by an easy transition the pointed arch was soon adopted for all the wall openings as the most flexible and most in accordance with the spirit of the new style.

Everyone who turns over the pages in Mr. MACGIBBON'S book will be struck with the variety that appears among the churches. In Lyons and Vienne we see towers which are reminiscent of Italy. The church at Cruas seems trans-

planted from the Rhine district. St. Paul-trois Châteaux has pilasters, an arcade, and other details which "might be part of a Roman amphitheatre." The south porch of Ste Martha, Tarascon, has nook shafts with caps partly copied from the Corinthian and partly carved with Romanesque figures. The arch mouldings, too, "contain a curious mixture of Roman and Mediæval ornaments in the Classic egg combined with the Gothic dog-tooth enrichments." Cistercian severity is to be found in St. Trophime, Arles, but the ornate porch, with its frieze suggestive of the *Dies Ira*, its sculptured interspaces of the columns, and tympanum showing CHRIST with the Evangelistic symbols, is in a different style. Some see in it evidence of the reaction, and suppose it to have been erected at a later time than the nave, but Mr. MACGIBBON believes it to be "part of an older building which has been preserved in the reconstruction of the nave." In any case the difference between outside and inside is very remarkable. In a somewhat similar style is the triple porch of Saint Gilles, but it is a far finer example of the Provençal style. Les Saintes Maries presents an example of a church which could be used as a place of safety by the parishioners. Another is Saint Victor, Marseilles. The most remarkable example of a fortified church is, however, the cathedral of Béziers, a town which was left without inhabitants during one of the massacres in the crusades against the Albigenses. At Moronet is a Cistercian abbey church which seems to be little altered. In it "the piers of the nave are simply portions of a side wall set on square slabs as a base." St. Maximin possesses a church which, as a good specimen of Northern Gothic, seems out of place in the district; the west front, however, is incomplete. Trejus Cathedral is covered with round intersecting vaulting, with deep groins springing from massive square piers or interior buttresses. The octagonal baptistery, with columns of granite having white marble capitals, which are placed at the angles, is as interesting as the neighbouring church. At Trejus the cathedral, tower, cloisters, baptistery, and palace are all united, forming a fortified group. The apse is utilised. The interior is circular, but the exterior is only slightly rounded, "and is carried up to a considerable height as a tower of defence, and armed with an embattled parapet at the top, supported on bold corbels with machicolations between them." The cloisters have arcades of a much later construction; the coupled columns bear beautiful caps.

The little island of St. Honorat opposite Cannes is described by Mr. MACGIBBON as possessing "the most interesting series of buildings in the Riviera, combining, as it does, some features of the architecture of every period and style of Provençal art, whether ecclesiastical or civil." Among the buildings illustrated is the ancient Chapel Ste Trinité, which is plainly but solidly built, with a triapsal choir. Mr. MACGIBBON supposes it to be "a rude attempt to imitate the triapsal and domical forms originally used in the Early Christian architecture of the cemeteries at Rome, and afterwards more fully developed in the East." The doorway has a massive lintel that would do credit to a cyclopean structure. Further on, at Grasse, columns are seen in the cathedral which resemble Norman work. The vaulting has deep square groins springing from square caps. At Biot is a church which at one time must "have been interesting, for it belonged to the Templars in the thirteenth century, but it is modernised" into a commonplace Renaissance chapel. But to enumerate all the churches along the azure coast which Mr. MACGIBBON describes would need more space than can be afforded. One thing may be remarked, that there are no repetitions among the churches he selects; each has something characteristic, and the majority are interesting.

The castles compete with the churches in attracting the attention of the reader. In the same way as proximity to the Mediterranean favoured the introduction of new ideas in art, it facilitated also the attacks of pirates. It was necessary to be prepared for resistance. In no part of Europe are so many remains of fortified castles to be found, and what remains are picturesque. Some, as Avignon, are of great size, but the smallest would make a subject for an artist.

Mr. MACGIBBON has carefully studied the books of MERIMÉE, VIOLLET-LE-DUC, and LEUTHERIC, but he has been more self-reliant when describing the churches and fortresses. His book will be an invaluable companion for

\* *Architecture of Provence and the Riviera.* By David Macgibbon. Edinburgh: David Douglas.



visitors to the South of France and the Riviera, and it will also afford information concerning an important phase of architecture.

### SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

AT the meeting of the Sheffield Society which was held last week, Mr. H. W. Brewer read a paper on "The Smaller Mediæval Municipal Buildings of Central Germany," which was illustrated by a fine collection of unique pencil and water-colour drawings. Mr. Brewer explained the origin and marvellous development of municipal institutions in Germany and the Low Countries during the Middle Ages. They suited the character and genius of the people, and were especially vigorous in the free towns and those under the sway of the Prince Bishops. Municipal life and character flourished throughout the German Fatherland at that period to an extent unknown elsewhere, and in its free and bracing atmosphere architecture and all the arts and crafts flourished. The lecturer proceeded to describe in detail the interesting Rathhauses or municipal halls of Wurzburg, Munster, Hildesheim, Ratisbon, and Prague; and those of a smaller and less known type, such as Rothenburg and Dettlebach. Referring to an exquisite sketch of the latter, he pointed it out as an example of the ingenuity and inventiveness of the old architects, who generally turned difficulties to advantage. This building, so to speak, stood on no ground at all, being partly over a street and a river, and there were many such examples of the utilisation of difficult town sites which were invaluable to the architect of to-day. He alluded to the interesting Rathhouse of Ochsenfurth, where the council chamber has the original tables and furniture of carved pine wood, and a unique bronze pint or measure now in daily use, and dating from the fourteenth century. He pointed to sketches of these interesting fittings, and concluded by relating a humorous story about the abuse of municipal institutions in modern Germany, especially in the smaller towns and villages, where red tape and officialism are rife.

Mr. C. Hadfield, in moving a vote of thanks, remarked that the drawings had the graceful touch, feeling, and accuracy of a Prout, and evidenced that the labours and researches of the lecturer had been a labour of love. The important question of new municipal buildings in Sheffield was within measurable distance, and he had every confidence that the municipal life and character of their old town to-day would be able to produce happy results if only the work was undertaken in the common sense, practical, and artistic spirit that characterised the buildings of the old German burghers. Mr. Hemsoll seconded, and a hearty vote of thanks was awarded to Mr. Brewer for his interesting paper.

### EDINBURGH ARCHITECTURAL ASSOCIATION.

THE paper read at the meeting on the 13th inst. was by Mr. Archibald C. Elliott, D.Sc., assistant to the Professor of Engineering in the Edinburgh University, being "Recent Departures on Electrical Engineering." The subject of artificial lighting, he remarked, belonged to the utilitarian rather than to the artistic side of the architect's business, and in his vocabulary was one of a set of three—lighting, warming, and ventilating—none of which had, unfortunately, hitherto received from him all the attention which was justly its due. Restricting the scope of the paper to the recently developed systems of distribution at high pressure from main generating stations, Dr. Elliott hastily glanced at the history of the subject, which, he stated, might be said to commence with the lighting in 1884 of several stations on the Metropolitan Railway by the system of Messrs. Gaulard & Gibbs. Until then, engineers had thought that there was no help for it but to let from 50 to 75 per cent. of the prime cost of an installation be sunk in copper mains; but on the new system the electrical energy was transmitted through comparatively light mains at enormous pressure—from 1,000 to 10,000 volts—and, by means of "transformers," placed at convenient points, was delivered to householders at the quite harmless but useful pressure of 50 to 100 volts. Dr. Elliott then showed how, in the modern transformer, the usually intractable property of self-induction turned itself to good account, and was the means of rendering the apparatus almost perfectly self-regulating. The efficiency of a transformer was rather difficult to measure; and that in some degree accounted for the distrust with which it was at one time regarded. The theory had, however, all along pointed to a high efficiency; and it might now be said with safety that the efficiency of a good transformer at full load was considerably over 90 per cent. In order to show the great advance which had been made, he had calculated the cost of a distributing main for 5,000 lamps, extending, say, from some distance west of St. Mary's Cathedral to somewhere beyond

St. Andrew Square, to be, on the old parallel system, 14,000*l.*; on the three-wire system, 10,500*l.*; and on the new high-pressure transformer system, 4,200*l.*; and, in addition to the saving in cost, the transformer system, he pointed out, had the advantage of a much more constant pressure in the mains. Mr. Ferranti, the engineer to the London Electric Supply Corporation, whose company at present worked the Grosvenor Gallery installation, had decided to use in the new Deptford installation, which would be without exception the largest in the world, no less a pressure than 10,000 volts. The expansion would be carried out in two stages—first, from 10,000 to 2,400 volts, and then from 2,400 down to 100 volts in the consumers' mains. On the advice of Sir William Thomson, Mr. Ferranti was going to use for the 10,000 volts mains a conductor of two concentric hollow copper tubes separated by an insulating compound. The outer tube would be at the potential of the earth, so that although the main might be transmitting energy at the rate of 5,000 horse-power it might be touched with impunity. Mr. Heaviside had shown that the copper near the axis of a conductor carrying alternating current was, owing to self-induction, much less effective than the outer part; and it would be interesting to see how far this conclusion was borne out practically at Deptford. Through the kindness of Mr. Ferranti an actual 2,400 volt transformer and some other apparatus for the Deptford installation were exhibited to the meeting.

### HOUSE PROPERTY IN GLASGOW.

AN ordinary meeting of the Architectural Section of the Glasgow Philosophical Society was held on Monday night in the Rooms, 207 Bath Street, Mr. James Thomson, president, in the chair. Mr. James Chalmers, architect, read a paper on "Some Considerations Affecting Unremunerative Property in Glasgow." Whether a property was remunerative or unremunerative depended, Mr. Chalmers said, on the return or the rate of interest it yielded on the money invested. The City Improvement Trust, in order to save a certain loss, combined with the pleasure of providing a few houses for the poor, were willing to consider a small interest as an ample recompense for their expenditure. But a distinction must be made between business and philanthropy. Property was remunerative or otherwise according as it returned an adequate or inadequate interest. Mr. Honeyman thought 5 per cent. a fair interest on the housing of the poor, and others considered 4 per cent. sufficient, holding that plenty of capital would be forthcoming at that rate. In the case of Mr. Goschen's conversion scheme, we found investors taking 2½ per cent. on first-class security, but this was only practicable on the part of Mr. Goschen because there was such an amount of money in the country seeking an investment of some kind. The question came to be this. If 3¼ per cent. was considered a fair remuneration on such securities as railways and Corporation stock, what was a fair amount on property rent? Clearly the difference in risk. That varied very much, and he found that corresponding periods had somehow occurred after intervals of ten years. These were made up of about three years of depression, three years of steady trade, and three years of excited trade, the last of these bringing on the depression again and creating panic and collapse. As a matter of fact, property was often remunerative or otherwise very much in sympathy with the divisions of these trade or credit cycles, and what they had to do was to try and find out the causes of them. Those who had experienced the results of the inflated period which terminated in the collapse of the City of Glasgow Bank should not find that very difficult to do. When it was believed that property was the investment of the future, speculators rushed into building operations, with the result that the supply exceeded the demand, and the investment became an unremunerative one. That was the case at the time of the building mania, 12 or 15 years ago, the result of which was that the public had no confidence in property as an investment. If property were bought when at its cheapest, and the investor could afford to hold it, he was sure to gain; but if bought at its dearest he was sure to lose, unless he could hold until another inflated time came. Regarding the houses inhabited by the poor, Mr. Chalmers said that if they were not remunerative it was because these slums had changed hands at an inflated value, and the present holders must be taking extraordinary means to retain a sufficient interest on this value. He thought that after allowing for taxes, repairs, and depreciation, the risk in this class of property should be amply covered by a return of 4 per cent. Referring again to the tenements erected by the Improvement Trust in Saltmarket, he said it seemed to be admitted on all hands that they were not dwellings for the poor. The rent the poor could afford was 7*s.* 6*d.* to 10*s.* per month, and as the rent charged was more than that they were valueless to the poor. He thought property was taxed too highly, and that all real property, or actual income, should be taxed as well as property.



## TESSERÆ.

## Generalising in Art.

SIR C. L. EASTLAKE.

IN representations which depart altogether from nature, and belong to the regions of poetry, those details are suppressed which would betray the convention of the idea. In very abstract representations of nature, also, all circumstances which would diminish the grandeur of the impression are omitted. There is evidently, then, a necessity for generalising in every branch of art; there is always much to be omitted, and the omission of useless or pernicious detail only makes the whole, the ruling idea, more impressive and distinct. In the imitation, therefore, of nature the great question is, What is the general character of the impression received? and next, What are its chief causes? If these are duly ascertained, the opposite circumstances which counteract the impression are easily detected and suppressed, or only hinted at. It is not uncommon to find persons who have the truest feeling for the poetry of a scene (and even artists are among them) who in imitating the same scene on paper or canvas make such things prominent as destroy the very feeling they experience. This translation of a feeling into picturesque analogous representations is an art of itself. There can be no doubt that our memory of nature is composed entirely of general ideas, and art must be generalised to meet this idea of beauty. The mere copying of nature in detail is not only objectionable, because it does not correspond with our impression of her, but it immediately suggests the feeling of its inferiority to nature, and the more so the closer it is. Thus an imitation so close as to produce illusion to the eye would be precisely that which would be considered defective, because whatever remains unaccomplished—sound, motion, &c.—would be felt to be wanting.

## The Pantheon, Rome.

VIOLET-LE-DUC.

What, in the Pantheon at Rome, is it that produces the most lively impression? It is that immense vault which derives all its decoration from its very structure; it is that single opening for light, 26 feet in diameter, perforated in its summit, through which the zenith is seen, and which throws upon the pavement of porphyry and granite a large circle of light. It is there that the genius of the Roman appears in full strength. So great is the elevation of this orifice above the floor, that its enormous opening scarcely affects the internal temperature. The most violent storms scarcely send down a breath of air on the head of a person standing beneath its orbit; and when it rains, the drops are seen falling perpendicularly down upon the pavement of the Rotunda, on which they describe a circle of wet. The cylinder of raindrops, falling from that height through the space of the building, renders sensible the immensity of that space. It is in conceptions like this that the Roman is really grand, because they are the outcome of his own genius, and because for their execution he borrows from no one, nor asks the aid of any artist whose nature is foreign to his own.

## Nero and the Burning of Rome.

G. H. LEWES.

There is no assignable motive which can point suspicion at Nero, and he happened to be absent from Rome when the fire broke out. The silly credulity which for centuries has accepted this story, with its mythical embellishment of Nero in mad exultation at the success of his wantonness fiddling above the burning ruins, is a striking example of what will pass as history. Suetonius gravely relates that some one having quoted a Greek verse, the meaning of which is, "After my death I care not if the world perish in flames," Nero exclaimed, "Nay, let it perish while I live." "And," adds the historian, "he acted accordingly; for, pretending to take offence at the ugliness of the old buildings and the narrowness of the streets he set the city on fire, and this was done so openly that several consulars found tow and torches in the houses of his attendants, but were afraid to meddle with them. He knocked down the walls of the granaries, which were of stone, in order that the flames might spread. The fire he beheld from a tower on the top of the villa of Mæcenas, and being hugely diverted with the splendours of the flames, he sang the 'Destruction of Troy' in the dress worn by him on the stage." Yet the people patiently submitted to be ruined, and thus openly mocked, not even wreaking their vengeance on the attendants! Suetonius in a previous chapter has recorded of Nero that he ordered piazzas to be erected before all the houses, great and small, in order that in case of fire there might be a commanding position for extinguishing the flames; and these piazzas were constructed at his expense, so little did he disregard the interests of his subjects. Tacitus, a graver writer, tells the story with less manifest fiction. He says that the fire was by some attri-

buted to accident, and by others to the wickedness of Nero, adding, "Nero at that time was at Antium, and only returned to Rome on the day when the flames approached his own palace, which he had built to join the palace of Augustus with the garden of Mæcenas. This palace and all the buildings around it were burned. To console the people, wandering and houseless, he opened the Campus Martius, and the monuments of Agrippa, as well as his own gardens. Here sheds were hastily constructed to shelter the poorest. Furniture was fetched from Ostia, and the price of corn was considerably reduced." Thus the public acts of Nero are not only those of one innocent of the imputed crime, but are those of an emperor really concerned for the misfortunes of his people. It is quite possible that such acts may have been mere hypocritical attempts to disarm suspicion; and if the crime were proven, or even probable, such an interpretation might pass. But what evidence, what probability is there, to justify such an accusation? The vague rumours of an exasperated people. How these arise, and how supremely they dispense with evidence, need not be told. Have we not in our own time known the famine in Ireland boldly assigned to the wrath of Heaven because the words *Defensor Fidei* accidentally were omitted in a new issue of silver coin? and this accusation proceeding, not from ignorant and turbulent mobs, but from the ignorant and bigoted "religious world," as it unjustifiably calls itself. Jurymen accustomed to deliver verdicts in cases brought by fire insurance offices must know the kind of evidence which they demand, before they believe that a fraudulent tradesman has set fire to his own premises. I ask them if they can see anything of this kind in the accusation against Nero? Without demanding the completeness of circumstantial evidence which would coerce their verdict against a living man, I simply ask whether there is any evidence against Nero? All that historians have produced has been given in the foregoing narrative; its value may now be estimated.

## Admission of Air to Rooms.

D. GALTON.

Air should be introduced and removed at those parts of the room where it would not cause a sensible draught. Air flowing against the body at, or even somewhat above, the temperature of the air of a room, will cause an inconvenient draught, from the fact that, as it removes the moisture of the body it causes evaporation or a sensation of cold. Air should never, as a rule, be introduced at or close to the floor-level. The openings would be liable to be fouled with sweepings and dirt. The air, unless very much above the temperature of the air of the room, would produce a sensation of cold to the feet. It may be regarded as an axiom in ventilating and warming that the feet should be kept warm and the head be kept cool. The orifices at which air is admitted should be above the level of the heads of persons occupying the room; the current of inflowing air should be directed towards the ceiling, and should either be as much subdivided as possible by means of numerous orifices, or be admitted through conical openings, with the smaller openings towards the outer air and the larger openings towards the room, by which means the air of the entering current is very rapidly dispersed. Air admitted near the ceiling very soon ceases to exist as a distinct current, and will be found at a very short distance from the inlet to have mingled with the general mass of the air, and to have attained the temperature of the room, partly owing to the larger mass of air in the room with which the inflowing current mingles, partly to the action of gravity in cases where the inflowing air is colder than the air in the room.

## Endurance of Storey Posts.

E. M. SHAW.

The contents of a building have undoubtedly much to do with its safety or danger; but, in estimating the whole risk, the materials of which the building is constructed must never be put out of consideration. Every building cannot be erected with brick columns and groined arches; but there is a vast range between these and the miserable cast-iron posts too commonly to be seen, many of which have been put in without having been tested for strength even at the ordinary temperature of the atmosphere, much less at that of a fire. The following illustration may be given of a fact well known to all firemen of experience, but seldom proved to demonstration for those not specially interested. A fire occurred in a warehouse of enormous proportions, and raged with great fury for five hours, at the end of which time it was extinguished, and a very large proportion of the building and its contents saved. The warehouse was constructed of brick walls; it had wooden floors, supported on wooden beams, which in their turn were carried on wooden storey-posts about 12 inches thick; and, although serious damage was done, not one portion of the heavy woodwork was destroyed. After the fire the proprietors allowed the chief of the fire brigade to remove one of the storey posts, with a section of the beams and other parts surrounding it above and below. This post had been subjected to



the full action of the fire during the whole of its duration, as already mentioned, or, making full allowance for everything, including the delay of the fire attacking the particular spot on which it stood, and the time at which the cooling process commenced, certainly not less than four and a half hours. As large quantities of water had been used, and it was probable that everything had been saturated, the wood was carefully dried before a strong fire until not a trace of moisture remained in it. It was then set on end in an open yard, exactly as it had stood in the warehouse, with the pedestal underneath, the cap above, and the beam across the cap; more than a ton of shavings, light wood, and heavy wood were placed round it, and after the whole heap was saturated with petroleum a light was applied to it; and, after this, large quantities of petroleum and turpentine were pumped on it. At the end of two and a half hours the post, beam, and other parts were withdrawn from the fire, and within a few minutes from the time at which they were withdrawn they ceased to burn. A few feet were then sawn off horizontally, at that part which had suffered most from the flames, and afterwards the same piece was split longitudinally with steel wedges, in order to examine its condition. The post was of pitch pine, about the most inflammable wood known, and yet after exposure for seven hours to fires, the fury of which could not be exceeded except in blast furnaces, it contained within it a quantity of perfectly uninjured and apparently fresh wood, probably capable of supporting the whole weight which the original post was designed to carry. Immediately after the saw-cut, and again after the cleaving with steel wedges, the centre was carefully examined and found to be just perceptibly warm to the touch, but nothing more, thus proving that the fibre in which the strength lay was quite uninjured.

#### First Steps in Painting.

T. EAKINS.

The brush is a more powerful and rapid tool than the point or stump. Very often, practically, before the student has had time to get his broadest masses of light and shade with either of these, he has forgotten what he is after. Charcoal would do better, but it is clumsy and rubs too easily for student's work. Still the main thing that the brush secures is, the instant grasp of the grand construction of a figure. There are no lines in nature, as was found out before. Fortuny exhibited his detestation of them; there are only form and colour. The least important, the most changeable, the most difficult thing to catch about a figure is the outline. The student drawing the outline of that model with a point is confused and lost if the model moves a hair-breadth; already the whole outline has been changed, and you notice how often he has had to rub out and correct; meantime he will get discouraged and disgusted long before he has made any sort of portrait of the man. Moreover, the outline is not the man; the grand construction is. Once that is got, the details follow naturally. And as the tendency of the point or stump is, I think, to reverse this order, I prefer the brush. I do not at all share the old fear that the beauties of colour will intoxicate the pupil and cause him to neglect the form. I have never known anything of that kind to happen, unless a student fancied he had mastered drawing before he began to paint. The first things to attend to in painting the model are movement and the general colour. The figure must balance, appear solid, and of the right weight. The movement once understood, every detail of the action will be an integral part of the main continuous action, and every detail of colour auxiliary to the main system of light and shade. The student should learn to block up his figure rapidly, and then to give to any part of it the highest finish without injuring its unity. To these ends I have not the slightest hesitation in calling the brush, and an immediate use of it, the best possible means.

#### The Object and Aim of Art.

G. W. F. HEGEL.

It is the object and aim of art to bring within the circle of our senses, perceptions, and emotions everything which has existence in the mind of man. Art should realise in us the well-known saying, "Nihil humani a me alienum puto." Its appointed aim is to awake and give vitality to all slumbering feelings, affections, and passions; to fill and expand the heart, and to make man, whether developed or undeveloped, feel in every fibre of his being all that human nature can endure, experience, and bring forth in her innermost and most secret recesses; all that has power to move and arouse the heart of man in its profoundest depths, manifold capabilities, and various phases; to garner up for our enjoyment whatever, in the exercise of thought and imagination, the mind discovers of high and intrinsic merit, the grandeur of the lofty, the eternal and the true, and present it to our feeling and contemplation. In like manner, to make pain and sorrow, and even vice and wrong, become clear to us; to bring the heart into immediate acquaintance with the awful and terrible, as well as with the

joyous and pleasurable; and lastly, to lead the fancy to hover gently, dreamily on the wing of imagination, and entice her to revel in the seductive witchery of its voluptuous emotion and contemplation. Art should employ this manifold richness of its subject-matter to supply on the one hand the deficiencies of our actual experience of external life, and on the other hand to excite in us those passions which shall cause the actual events of life to move us more deeply, and awaken our susceptibility for receiving impressions of all kinds. For we do not here require absolute experience to excite these emotions, but only the appearance thereof, which art substitutes for sheer reality. The possibility of this illusion, by means of the representations of art, rests upon this, that every reality must pass through the representative medium before it can be cognised by the mind or acted on by the will, and therefore it is immaterial whether we are acted on by external immediate reality, or receive our impressions through other means, viz., pictures, signs, or forms which represent the qualities of this reality. Man can also picture to himself unreal things, as if they absolutely possessed reality. Therefore, whether we receive the impression of a situation, a relation, or the subject-matter of a life through the medium of external reality, or only through the representation of it, in both cases we are sufficiently affected to sorrow and rejoice, to be moved or agitated according to the nature of the subject, and in both cases we run through, in quick succession, the feelings and passions of anger, hate, pity, anxiety, terror, love, esteem, wonder, honour, and fame.

#### Towers and Spires.

J. DALLAWAY.

Old St. Paul's spire, of wood and lead, was 520 feet high; St. Stephen's, Vienna, 465; Strasburg, 456; Salisbury, 387; Norwich, 317; and Chichester, 290. The singularly beautiful spire of Louth, in Lincolnshire, was begun in 1502, and finished in ten years, by John Cole, architect, at the expense of 305*l* 7*s* 5*d*; it is 134 feet high, exclusively of the tower—total 282. Grantham, 144. The central spire of Lichfield is 258 feet high, and those of the façade 185 each; St. Michael's, Coventry, 300, which was built in imitation, and very probably by the same architect. The last-mentioned are all of stone. The spire of St. Andrew's, Worcester, which is extremely elegant, was built in the eighteenth century by Nath. Wilkinson, an uneducated mason. The height from the parapet of the tower is 155 feet 6 inches, the thickness of the walls of the spire is 20 inches, and under the capital and weathercock only 6½ inches. From a survey of Salisbury Cathedral it appears that the spire did not form a part of the original plan, but was added many years after its completion. The spire of Chichester Cathedral resembles it very nearly on a smaller scale, and was traditionally the work of the same architect. Of the twenty-two cathedrals in England, Salisbury, Chichester, Lichfield, and Norwich have most beautiful central spires; those of Oxford and Rochester are not worth noticing. The spire of old St. Paul's was finished 1221; Sarum, 1256; Chichester, 1270; Norwich, 1278; Lichfield, 1370; St. Michael's, Coventry, 1395. Magdalen Tower is 122 feet high, diameter 26. The cathedral at Gloucester, 224; Lincoln, 288; Canterbury, 235; Ely, 270; York, 234; Durham, 210; Worcester, 196; Wrexham, 132; Doncaster, 152; Derby, 174. Towers of Beverley, 198 each—the prototypes of those of Westminster; St. Stephen's Church, Bristol, 124; Taunton, Somersetshire, 153; all of which were built between 1400 and 1520. Towers of this age in Gloucestershire and the West of England are very frequent and beautiful. The tower built by Giotto in 1334 at Florence is 264 feet high, with a diameter of 46. The Falling Tower at Pisa is 188 feet high. The tower at Boston, in Lincolnshire, is finished by an octangular louvre, having in the whole an elevation of 282 feet. It was built about the year 1309, probably by the Flemings established there, and is said to resemble that of the great church at Antwerp. At Bruges I remarked a similar tower attached to the town-house, and another at Brussels. The central tower of the abbey of St. Oüen at Rouen, which is octangular and of the same date, is 240 feet high. The lantern tower at Ely is 170, and of a similar construction. Another at Peterborough is 136 feet from the floor. The tower of St. Nicholas in Newcastle-upon-Tyne is 194 feet high, and has a spire formed upon open arches, as a superstructure supposed to have been added in the reign of Henry VI. This idea was afterwards adopted by Sir Christopher Wren, in the tower of St. Dunstan in the East, London.

Mr. Whitworth Wallis, keeper of the Birmingham Municipal Art Gallery and Museum, on Tuesday delivered a lecture to the members of the Birmingham Architectural Association in the library of Queen's College on "Pompeian Art," being the third of a series which he has given before the members of the Architectural Association. The lecture, like those which had preceded it, was illustrated by limelight views.



## NOTES AND COMMENTS.

THE wisdom of the Belgian Chambers in voting a sum of money for the purchase of manuscripts from the PHILIPPS Collection in Cheltenham is now apparent. The country has by means of it come into possession of treasures which will be invaluable to posterity. Sir THOMAS PHILIPPS was one of those men who knew how to turn events to their advantage. Seeing that Belgium was a battlefield during the NAPOLEON epoch, he concluded that many people would in consequence be deprived of means, and would be ready to sacrifice things to obtain money. He was rich and influential. During forty years it was the business of his life to seek after manuscripts in convents that were poor or were about to be suppressed, and he was successful beyond the dreams of collectors. When Sir THOMAS died, his trustees, following the custom that is common, obtained power from the Courts to sell manuscripts to foreign states. Although Belgium was the most profitable field, he did not confine his researches to it, and his collection was enriched with Italian, French and English manuscripts, which will in due course find their way to the proper places. The Bibliothèque Royale, the archives office of Belgium, has secured manuscripts of which the country may be proud. Some are of historical interest, others are beautiful as examples of illumination and calligraphy. For instance, there are thirty-five volumes of the records of the Abbey of Cambron in the twelfth and thirteenth centuries. As the primitive binding of undressed hide is conserved, the volumes will have an additional charm in the eyes of bibliophiles. The records of the Abbey of St. Ghislain go back to the ninth century. The volumes from Villers contain, among other things, examples of fourteenth-century plain-chant. From the Abbey of Aulne, which was burnt by the French in 1794, no less than 110 volumes were saved by the peasants, and once more they find their way back to Belgium. One of them is "Euclid's Geometry," with a thirteenth-century commentary. But an enumeration of the manuscripts would occupy many pages. Some, like the diary of a gentleman in waiting, which is a history of the Spanish court between 1587 and 1599, with an abundance of pen sketches, should be reproduced. The charters and other documents relating to the cities and towns will be prized by a country where there is a passion for municipal history.

MR. WALTER EMDEN (who is a candidate for a seat on the County Council of the Metropolis) has offered to the Society of Architects three premiums of ten pounds each, which will be awarded for essays on constructional subjects, according to conditions which are to be arranged by the council of the Society. This year "Constructional Iron-work" is selected. The essays are to be sent to the Secretaries on or before February 28, 1889, and the prizeman is to read his composition on the following April 9. An essay is to contain 3,000 words, at least, and is not to exceed 6,000 words. It may be illustrated by five clearly drawn-up sketches.

TWELVE of the leading sculptors of France have agreed to take part in the competition for the memorial of CLAUDE GELÉE, or LORRAIN, the landscapist, which is to be erected in the public park of Nancy. A sum of 45,000 francs is fixed as the limit of the expense, and the work is to be handed over to the committee on April 1, 1890. The figures are to be in bronze and the pedestal is to be of stone or marble. The models, which are to be submitted before February 20, 1889, are to be one-fifth the contemplated size, and each competitor is to give a guarantee that the work will be completed for the stipulated amount. To the design placed second a premium of 1,500 francs will be awarded, and to the third one of 1,000 francs. The authors of the fourth, fifth and sixth designs will each receive 500 francs. All the premiated designs are to become the property of the committee, who will give them to the musées of the district.

M. PETITGRAND, one of the architects attached to the Historic Monuments Commission, and who has directed the restoration of the cathedrals of Puy and Séz, has been nominated as the successor of M. CORROYER in the charge of the works at Mont Saint-Michel. A letter to the Director

of the Beaux-Arts from M. CORROYER has appeared. He says he is less grieved by his dismissal than by the disloyalty which was shown to him in the defence made on his behalf before the Chamber. For fifteen years M. CORROYER has acted as architect at Mont Saint-Michel, and during that period he was compelled to struggle against the bishop, the monks, the municipality, and the engineers, all of whom were inspired by interests of their own, and in his contest he was loyally upheld hitherto by ministers and directors of the Department of Fine Arts. The book on Mont Saint-Michel which M. CORROYER brought out ten years ago was supported by the then Minister, and was crowned by the Institut. His independence created enemies, but the worst that could be brought against him was that he was a believer in religion. For that crime M. CORROYER has been turned adrift. He says proudly that his name is too closely associated with Mont Saint-Michel for any official act to erase it.

LOCAL Boards do well to insist on observance of by-laws, but they are not impeccable, and, as architects and builders well know, great inconvenience is often caused by their arbitrary decisions. A lesson has been taught to the Farnworth Local Board which we hope will have some effect in mending official conduct in other towns. A Mr. MULLINEAUX, or MOLYNEUX, was summoned before the Petty Sessions for a breach of the by-laws. On October 12 he deposited plans for a house and shop he proposed to erect. A week afterwards he received notice that his plans were rejected, but the Local Board did not condescend to give any reason for the withholding of approval. It was known that on two former occasions plans were lodged for the premises, but they were also unsuccessful. The building owner having three times failed, resolved to run the chance of having his buildings pulled down if they exhibited any deviation from the by-laws. It appears what the Board wanted was the forming of a street at the back of the premises. After hearing both sides the Justices decided that the local by-laws were observed in the construction, and they declined to grant a case for a superior court. It was held that a Local Board has no right to reject plans without pointing out the defects in them, and that a Board could not make it penal for a man doing something which he had a right to do. Elsewhere a different decision may be arrived at, but the Farnworth case deserves to be made a leading case.

It may not be known to all people who read articles about M. CLUSERET—the general of the Communists, whose election for Var has startled politicians in France and elsewhere—that he lives by the money obtained for his paintings. In the last Salon there were a couple of his paintings of scenes in Constantinople, in which city he appeared to have settled down as an artist after his condemnation to death in Paris for his services under the Commune. Few of the visitors to the galleries were able to recognise them as the work of the revolutionist who is a terror to the bourgeoisie. Latterly M. CLUSERET has taken to ceramic painting, and he was engaged in that kind of work when he was elected.

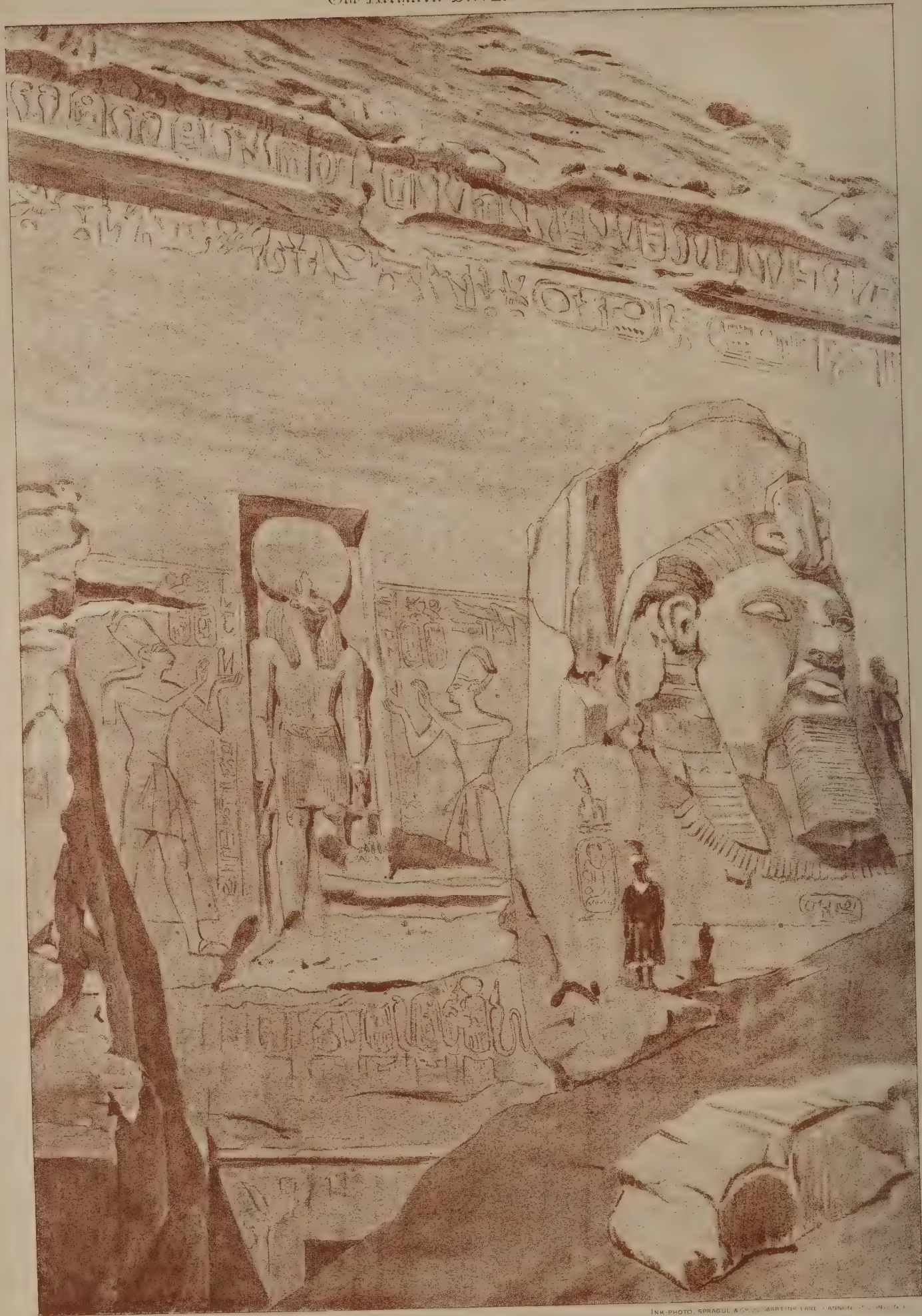
It is rather remarkable to find a work by a foreign artist on one of the walls of the Luxembourg Galleries. This honour has been accorded to M. ZORN, a Swedish artist, for his *Port d'Angleterre*, which figured in the last Salon and now finds a place among the works of modern French artists. Generally it was believed that the contents of the Luxembourg Gallery were to be entirely by Frenchmen.

By an Order in Council it is declared that the conditions of the Patent Act, 1883, under which an application for a patent is not to be invalidated by the exhibition of an invention at an international exhibition, are to apply to the Paris Universal Exhibition. Exhibitors are also to be relieved from the conditions of the Act, under which they were required to give notice to the Comptroller of Patents of their intention to exhibit the article afterwards sought to be patented. The regulations also apply to designs intended to be registered.









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TEMPLE OF ABOUSIMBEL.

Drawn by R. PHENE SPIERS.

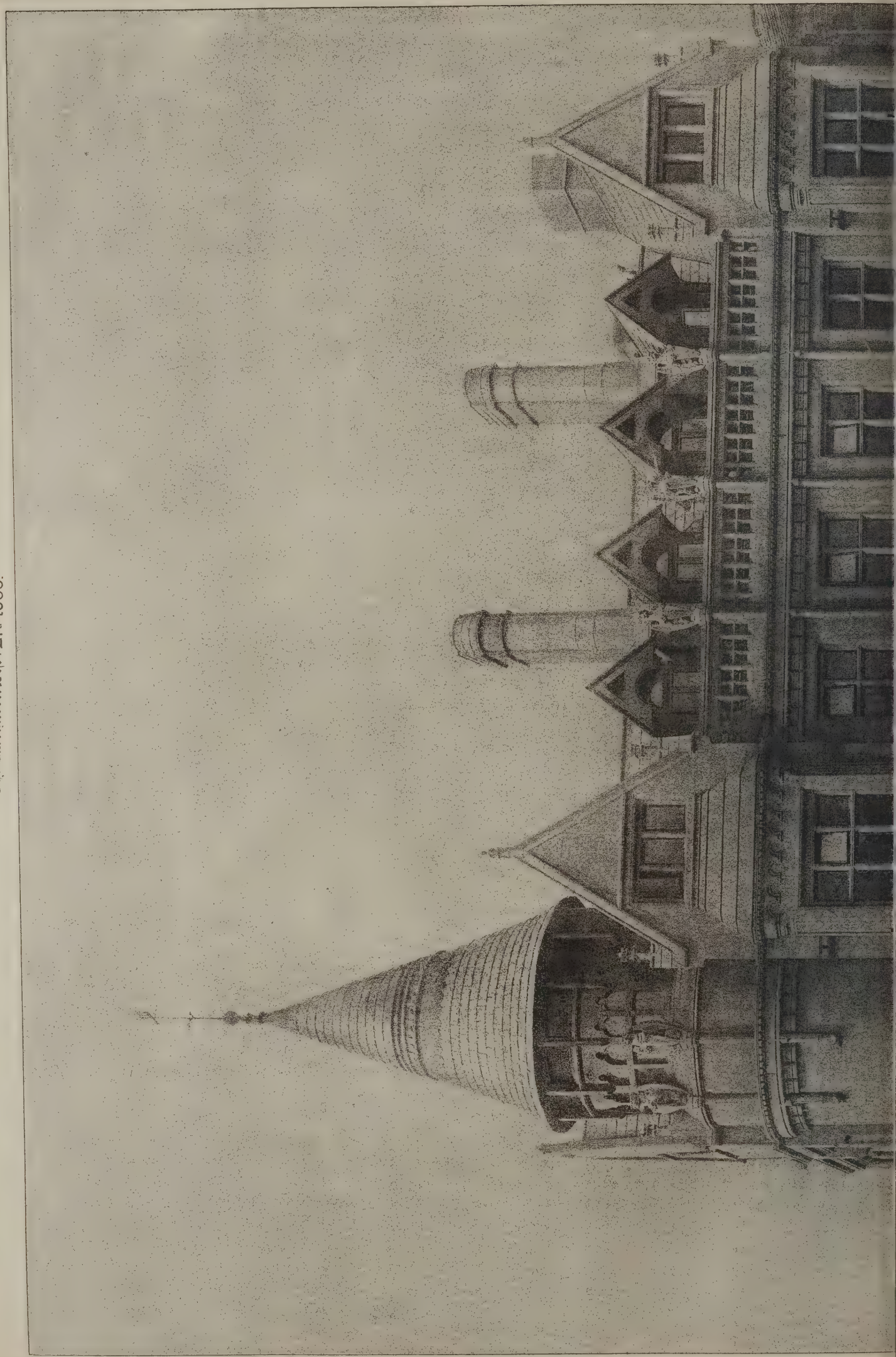
*The Temple of Abousimbel, Egypt. See page 100.*



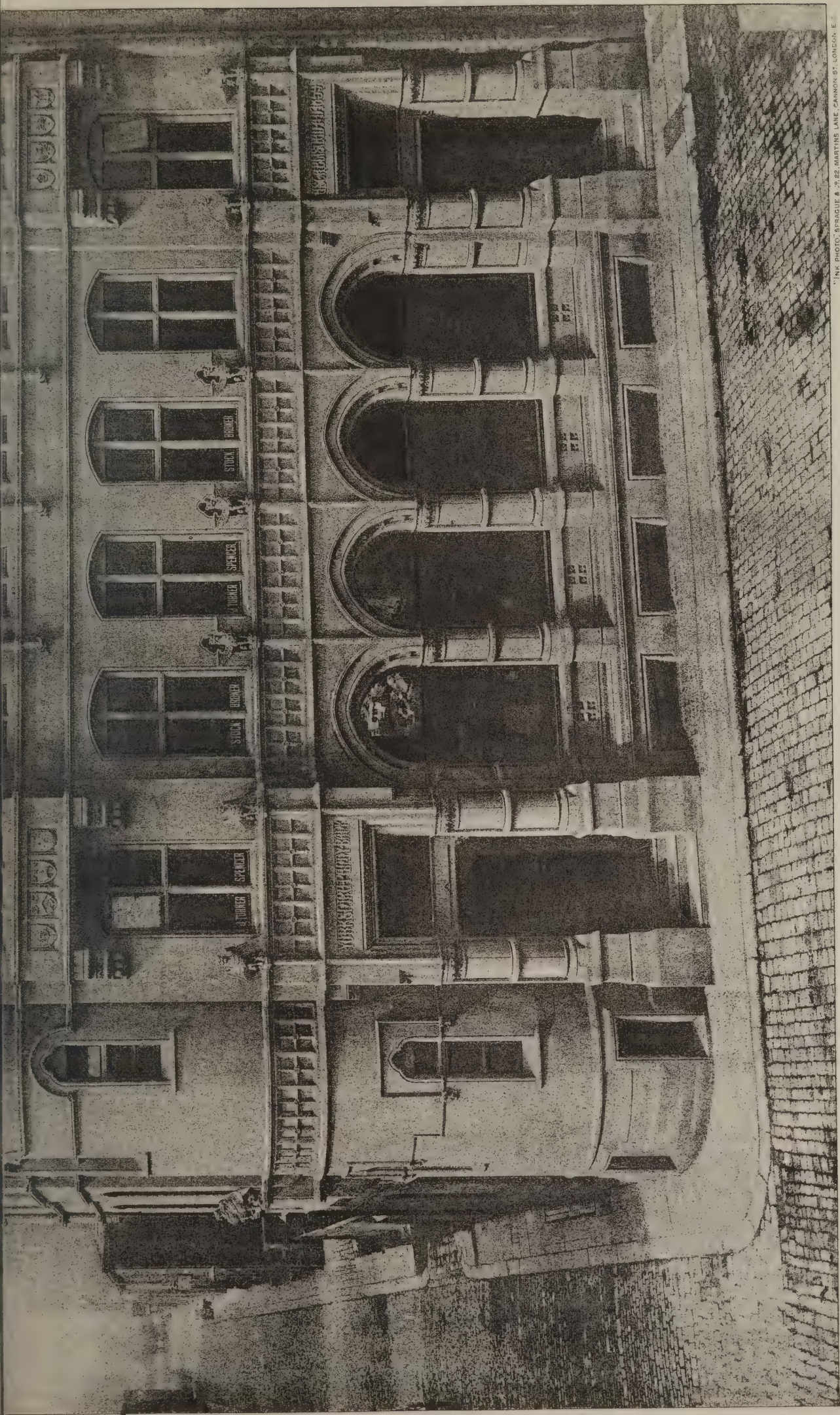




The Architect. Dec. 21<sup>st</sup> 1888.







"INA" PHOTO, SPRAGUE & S2, MARTINS LANE, CANNON ST. LONDON, E.

YORKSHIRE PENNY BANK, HALIFAX.

PERKIN & BULMER, Architects













GREAT COURT:

Drawn by P.



Dep. 21. 1888.



TEMPLE OF EDFOU.

PHENE SPIERS









TEMPLE OF EDFOU.  
Drawn by P. PHÉNÉ SPIERS.







## ILLUSTRATIONS.

YORKSHIRE PENNY BANK, HALIFAX.

THIS building is situated at the corner of Waterhouse Street and John Street, Halifax. On the ground floor is a large, well-lighted banking-room, with manager's-room, packing-room, and safe; retiring-rooms for clerks, and additional store-room on the basement. The banking-room is heated by hot-water pipes and lighted and ventilated by means of a sun-burner, additional light being obtained from Wenham lamps fixed on the clerks' desks and public counter. Warm fresh air is supplied by passing it over the pipes before entering the room. The building is faced with Halifax stone (Ringley), and covered with green Westmoreland slates. All the windows are fitted with wrought-iron casements fixed to the stone jambs, and glazed with plate-glass and clear glass in leads. The banking-room is fitted up with walnutwood counter and desks and panelled dado; the floor in front of the counter is of mosaic, and behind of polished wook blocks, and the ceiling is richly panelled with moulded ribs and cast ornaments of plaster. The staircase is of hard stone, with wrought-iron balustrade, and has a dado of unglazed tiles which extends round the corridors. This stair is continued to the top of the building, and receives additional light from the lantern which forms the turret at the angle of the building. The offices are arranged in pairs, the woodwork being mostly pitch-pine, finished with varnish. They are provided with open fireplaces, having polished wood chimneypieces and grates set in tiles, and are supplied with fresh air from a "patent ventilating lintel" over the doors, at times when it is not convenient to open the windows. Each set of offices is also fitted with speaking tubes from the entrance in John Street, with electric call-bells instead of the usual whistle. The building has been erected from the designs of Messrs. PERKIN & BULMER, architects, of Leeds. The bank fittings were specially designed by the architect; the mosaic floor and tiles are by Messrs. E. SMITH & Co., of Coalville; and the wood-block floors by the Wood-block Flooring Company, Hartlepool. Messrs. KAYE & SONS, Leeds and London, supplied the locks; the pavement lights are by Messrs. HEYWOOD & Co., London. Mr. CLIFF acted as clerk of works.

The cost of the entire scheme (not including site) will be about 5,000*l.*, and the work has been carried out by Messrs. J. CHARNOCK & SONS, Pellon Lane, Halifax, as the general contractors.

At the opening of the building it was stated that in 1864 the business of the branch was conducted in the basement of the Halifax Mechanics' Institution. In 1876 it had so grown that it was necessary to open the branch daily. At that time 53,000*l.* was due to depositors, but the amount has increased to 647,000*l.*, 600,000*l.* of which was calculated to belong to the artisan class.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.

NO. 43.—GREAT COURT, TEMPLE OF EDFOU. [R. PHENE SPIERS.]  
NO. 49.—TEMPLE OF ABOUSIMBEL. [R. PHENE SPIERS.]  
NO. 50.—TEMPLE OF EDFOU. [R. PHENE SPIERS.]

## THE ARCHITECTURAL ASSOCIATION.

THE fifth ordinary meeting of the Association took place on Friday evening, Mr. H. D. Appleton, president, in the chair.

The following gentlemen were elected members:—Messrs. A. Campbell, A. G. Wyand, D. M. Litster, J. K. Hunter, G. A. Luden, and A. W. Earle.

The PRESIDENT said a valuable studentship of 15*l.* was offered by Mr. Arthur Cates to enable a student to go to Paris to study the International Exhibition, both in regard of the construction of the buildings and the manufactures and architectural exhibits. The details, though not then finally settled, would, he hoped, be in their hands in a few days.

A hearty vote of thanks was spontaneously awarded to Mr. Cates.

Mr. WILLIAM DOUBLEDAY then read a paper on "Symbolism," which was well illustrated by drawings exhibited on the walls. On the conclusion of the paper a vote of thanks was passed to Mr. Doubleday.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AN ordinary meeting of the Institute of Architects was held on Monday evening, Mr. Alfred Waterhouse, R.A. president, in the chair.

The SECRETARY announced the decease of Mr. C. F. Hansom, of Clifton, Bristol, and of Mr. H. J. Paull, of Manchester.

Mr. MACVICAR ANDERSON, hon. secretary, announced the award of the Ashpitel Prize, as made by the Board of Examiners, to Mr. H. E. Stelfox, of Manchester. Mr. Paul Waterhouse, M.A., and Mr. H. W. Burrows, had run Mr. Stelfox so closely for the prize that the examiners had great difficulty in deciding who was highest in point of merit, and it had been determined to award these two gentlemen exceptional prizes of merit.

The PRESIDENT stated that the following gentlemen had ceased to be members:—Messrs. W. J. Audsley, C. F. Livezey, P. J. Byrne, J. L. King, E. L. Swatman, and J. J. Woodman.

A ballot then ensued, when the following were elected:—*As Fellows.*—Messrs. H. Lord, Manchester; H. Bridgford, Manchester; W. Horton, Manchester; J. Ely, Manchester; J. Littlewood, Associate, Manchester; W. H. Littlewood, Associate, Manchester; J. S. Crowther, Manchester; J. W. Trounson, Penzance; J. Maxwell, Manchester; W. C. Tuke, Manchester; T. E. Bridgen, Manchester; E. Schröder Prior, M.A.; O. C. Wylson, Associate; and W. T. Allen. *As Associates.*—Messrs. P. E. Barker, Rusholme; J. D. Mould, Manchester; and J. A. Berrington, Liverpool.

Mr. JOHN BELCHER read a paper, of which the following is an abstract, on

## Musical Requirements in Church Planning.

Mr. Belcher said that the development of ecclesiastical music of late years forced certain problems upon the attention of the architect, and that in church planning the position of voices and instruments had now to be considered. The first introduction of organs was in the seventh century, but they were generally used in conjunction with other instruments. Minstrels' galleries might still be found in small churches, the west end being the favoured position. During the period from Henry VIII. to Queen Elizabeth instrumental music was still adhered to, but the objections of the Puritans were such that in 1644 nearly every organ in use had been destroyed. From the Restoration, however, to the present day, organs were recognised as essential. It was only fifty years ago that 32-foot pipes were first used in England, although on the Continent the organ became very large at the end of the fifteenth century, reaching a climax in the seventeenth and eighteenth centuries. In most cases they were forced to migrate from the chancel to the west end, in some to the transept, and where neither position was available, they were relegated to the triforium of the nave. The choir being seated in the chancel, the position of the organ near them seemed essential, but other eventualities, such as additional bodies of singers and an orchestra, had to be remembered. In future church planning these requirements would have to be considered. The organ should be in a position not less or much less in height than the nave and transepts, the so-called "organ-chamber" being a mistake. The size of an organ should not be regulated by the size of the building, but by the number of "stops," the combination of which regulated the extent of the volume of sound. A good foundation tone was always necessary, to secure which speaking room had to be provided for 8-feet, 16-feet, and even 32-foot pipes on the pedal organ. These dimensions had to be considered in providing sufficient space. The top of a chancel-screen or rood-loft was hardly a suitable position for an organ of any size, as, although it possessed attractions from an artistic point of view, it was prejudicial to the organ tone. Organists and organ-builders generally considered that in fairly large churches the organ should be raised about 12 feet above the ground, and a divided organ could not be recommended. Proper and easy access to every part for repairs and tuning should be provided, and attention given to the position and space for the "feeders." An equable temperature was also important. The organ-case might be treated as an enclosure, in the way usually adopted by the Italians, having no special relation to its contents, wholly or in part concealed; or in the general, and the author thought appropriate, way of using some of the pipes themselves as decorative features in a framework enclosing the other parts of the organ. The use of iron in the construction of an organ-case he protested against, while wood was a material in sympathy with the organ, and the most consistent for the construction of its case. Sound travelled so slowly, that any division of choir, organ, or orchestra was destructive of precision, and they should therefore be compactly arranged, and as far as possible on the same plane. Mr. Belcher then described a sketch of a plan by himself to illustrate his meaning. The organ was placed in a special transept, east of the great transept, equal in height to the rest of the church, and forming the western end of the morning



chapel; it was virtually open on three sides, but was slightly sheltered; outside the main wall, and between the buttresses, a staircase with a wide landing served as a tuning-place for an orchestra before entering the gallery; this gallery, projecting into the chancel, gave space for an orchestra, which might be extended eastwards if required. The floor of the organ was 12 feet from the ground, the music gallery was lower, and as the floor of the chancel was raised by steps, all the performers were brought into close relation with each other and the organ. The usual north transept afforded an excellent position for grouping large bodies of voices adjoining the organ and orchestra, and easily under the control of a conductor at the western angle of the gallery. A corresponding gallery on the opposite side of the chancel would provide for female singers at ordinary services.

The PRESIDENT invited a discussion of the paper, which, he said, was both interesting and suggestive. The only fault he could find with the paper was it had been so short.

Mr. STATHAM proposed a vote of thanks to Mr. Belcher for the exceedingly practical paper. As to its brevity, also, it might serve as a model for other papers. He was much pleased to have heard the subject dealt with from so useful a point of view by an architect of Mr. Belcher's ability. One thing he hoped they would feel, namely, that the organ chamber was doomed. It was a cruel thing to place an organ there, for it was utterly lost in such a position. The difficulty was that various complications arose from the requirements, first of ritual, secondly of singers, and thirdly from the question of money. He did not profess to know much about ritual requirements, but he knew that many a modern clergyman would look black at a proposition to place the organ at the end of the chancel or behind the altar. But from a musical point of view that was the best position. The organ should have a central position that the sound should go well down the church; it should be near the voices, and the voices in front of the chancel, so that the position behind the altar, if unorthodox as to ritual, was musically orthodox, for it combined the fullest musical effects with the very practical matter of supporting the voices. Next best was the old position in the west end. There a fine organ was always built, but an organ far too large to accompany the choir. The organist had in it what he wanted, namely, an instrument to show off his fugues on. One way out of this difficulty was by use of the long movement which electricity had put in our power, but he thought the real solution would be to have a small choir organ near the choir, as well as the large organ at the west end for grand musical effects. He differed with Mr. Belcher that it was disadvantageous to the organist to be at a distance from the choir. But where money was not limited there could be a small choir-organ, and a large one for grand occasions and for accompanying congregational singing. He did not think the position on the rood screen in cathedrals was at all a bad one, though it was something strange to hear that the position was considered good for artistic effects, when they remembered the complaint of the architectural effect at St. Paul's being spoilt by the "box of whistles." If the organ thus placed sounded harsh, that he thought would be the fault of the organ. The position was a capital one; but this position was abandoned when organs became very large, and then the organ—as at Worcester Cathedral—was stuck about in all corners of a building. In such a case he would place the manual pipes on the screen, and the pedal pipes lower down. In the design of organ cases he thought an effect of harmonious contrast might be made with the large pipes, which were mostly of wood, and generally kept in the background, and the metal pipes. In the St. George's Hall organ the wooden pipes were disposed in a semicircular arrangement at the back.

Mr. WM. WHITE, F.S.A., seconded the vote of thanks. He said he did not remember that the subject had ever before been discussed at the Institute, though it was one of the most practical of questions in regard of church arrangements with which architects had to deal. He agreed with Mr. Statham's suggestion for two organs for large churches, though they would hardly be required in a small building. In the case of two organs, the position of the choir-organ was open to question on several accounts; but the position over the chancel screen was a very good position, if kept sufficiently low and subdued so as not to interfere with the general effect. The organ must not be too large for the building, or it would be an obstruction to the chancel. Mr. Statham had referred to western organs in Roman churches. It was not a question as to Roman and English churches, but as to the manner in which the church services were conducted. In English churches, the first consideration was that of congregational uses and not the æsthetic portions of the service—parts of the service that might and ought to be purely æsthetic, and that were to be listened to but not joined in by the congregation. In this case a western organ was essential unless an orchestra were substituted for it. Much had been lost in English churches by a too great abandonment of singing, which was superseded by the organ. That had its origin in the dull, dreamy tunes of the old

performers in the western galleries. When a change came in the services, a change necessarily followed in the character of the accompaniment; but instead of substituting an orchestra at the western end, the radical plan of sweeping away the western organ altogether was adopted. It was impossible either to look for or to expect æsthetic services in the large bulk of country or village churches. There were not the voices nor the means to provide them, and consequently the services must be almost exclusively congregational, and the organ must lead and support the choir in front without drowning it. The evil was that an organist was not content without an organ for æsthetic purposes, and he had little regard for drowning the choir. Organ-builders would strive after large instruments, and organists supported them in that regard. Not one organist out of ten but cared more for the organ than for the choir. As to placing the organist's seat under the canopy, organists preferred to have the seat there. The organist preferred to be somewhat sheltered from the great volume of sound that would come to him if seated to the front, and he could thus better judge if the performance of the choir and congregation and the instrument were in proper touch. In dealing with the organ-case, his (Mr. White's) first requirement was to know from the organ-builder and organist the arrangement and position of the pipes that they decided as the most fitting for the construction of the particular instrument, and, informed on these points, he endeavoured to clothe the work in architectural form. The aim should be to harmonise the requirements and construction of the organ as determined by the particular necessities, so that they should fit in with the purposes of the building.

Mr. C. FORSTER HAYWARD, F.S.A., said that organs were often overdone in English churches. Not only were choirs drowned, but the organ was too large for the building; and he knew of many places where this arose from having too much money. In the last case he had to deal with it would have been much better if there had been 200% or 300% less to spend on it. The organ was placed exactly in the position on one of the plans shown by Mr. Belcher as an example of what to avoid, and the pipes were so near the roof that if the full power was used something would occur; some said the roof would come down. The organ was blown by hydraulic power accompanied by a continual squeaking, a disagreeable accompaniment that apparently could not be got over. He wished the use of instrumental music besides that of the organ were more common in English churches. As to organ-cases, the finest, he believed, was one put up of late years by Mr. Burges—and none of the pipes were to be seen—in the speech-room of Harrow School. The arrangement of western organ and choir organ was carried out at Amiens Cathedral with a most beautiful effect.

Mr. M. B. ADAMS referred to Mr. Street's treatment of the organ at St. Mary's Church, Paddington, and at St. Augustine's Church, Kilburn. He (Mr. Adams) was not in favour of florid music, or anything approaching a concert in churches.

Mr. RALPH NEVILL, F.S.A., said one of the most important points brought forward was that relative to placing the organ at the east end, behind the altar. As Mr. Statham said, it would be a capital place for sound. Many parsons would hold up their hands with horror at the proposal, but there were many also on the look-out for novelties who would be pleased with it. Builders, too, would only be too glad to get out of having to put in an east window. There was no necessity to show the pipes of the organ. The front of the instrument could be designed as a reredos, and thus give an appropriate and ornamental ending to the church. The apsidal form could by this expedient be well utilised. The altar must be, as they had been shown, in the chord of the apse, and not placed against the wall, and then the inner and outer effects of the apse would be fully gained. In placing an organ a certain amount of compression was required to give full effect to the volume of sound from the instrument. It was advantageous to have the organ at a little distance away from the choir, as it gave the choir a better chance of being heard. As to the position on the screen, it depended where the congregation was placed. In cathedrals there were occasionally two congregations, one in the nave and the other in the choir; and in an ordinary way it might be a good plan to have the organ between the two. The western position was, after all, the best place. The greatest success he knew of was at the pro-Cathedral, Kensington. The organ was a splendid instrument, and there were first-class singers. The effect of the organ's tones rolling away through the building overhead was such as he had never before heard. No organist, he thought, could by the use of electricity get quite the grip necessary to produce the proper effects.

Mr. E. J. TARVER said that organs were placed on the north side of churches because the temperature in that position was more equable. At the church of the Miracoli, Brescia, a most ornamental feature had been effected by placing the organ boldly in the western end.



Mr. G. AITCHISON, A.R.A., said the only organ-case of any merit that he knew of was at Siena.

The President then put the vote to the meeting, and it was carried by acclamation. Mr. Belcher replied, and the proceedings terminated.

### MANCHESTER ARCHITECTURAL ASSOCIATION.

AT the fourth ordinary meeting held on Tuesday at the Diocesan Buildings, Mr. A. H. Davies Colley, the president, in the chair, a discussion was opened by Mr. H. B. Bare upon "Architects and Handicraftsmen." The foundation of a chair of architecture and the allied arts, such as sculpture and decorative painting, was suggested as very desirable at Owens College, Manchester, and other colleges of the Victoria University. The professor would direct a course of mental and manual artwork for those who afterwards might adopt any of the special branches of artistic professions or handicrafts. The result would be a sounder and wider education in art, and a greater sympathy between all professions and all handicrafts, which must before long improve art of every kind. Messrs. Hodgson, Mould, Stelfox, Mee, and the chairman took part in an animated discussion which followed.

### CAVE ARCHITECTURE.

A MEETING of the Archaeological Section of the Birmingham and Midland Institute was held at the Institute on Wednesday, when Major-General A. Phelps read a paper on "The Cave Architecture of Western India." Mr. Howard S. Pearson presided, and, in introducing the lecturer, said that he was sure they would all listen with pleasure to the lecture, the subject of which was of great archaeological interest. The lecturer having briefly referred to the cave-temples of the Island of Elephanta, so named after the great elephant carved in stone which had formerly stood there, said that the oldest caves were the work of the Buddhists, who had been forced to flee into the jungle and other hiding-places on account of their religion. These caves, which had sprung from single cells, were all carved out of the solid rock. They had in all probability been picked out with hammer and chisel, as chisel-marks were to be seen on portions of the rock. There were over a thousand such caves in India. Limelight views of some of these caves were exhibited, as well as several views of Hindoo temples also carved out of the solid rock. One of the temples shown was, so the lecturer stated, 150 feet in height and 270 feet in depth. A vote of thanks was passed to Major-General Phelps.

### THE GLOUCESTER CATHEDRAL REREDOS.

A SPECIAL meeting of the Provincial Grand Lodge of Gloucestershire Freemasons was held at the Masonic Hall, Cheltenham, on Tuesday, Sir M. E. Hicks Beach, Bart., M.P., Provincial Grand Master, presiding, to consider resolutions of the committee appointed at the last meeting on the subject of the decoration of the reredos in Gloucester Cathedral. The reredos was erected fifteen years ago by the Freemasons of the province, at a cost of £1,300, the work being executed by Redfern from designs by the late Sir Gilbert Scott. It is a white stone structure, divided into three principal compartments, in which are groups of figures representing the Nativity, the Entombment, and the Ascension of Our Saviour; figures of Moses, St. Peter, St. Paul, and David occupy the minor niches at the sides of these compartments; and under the canopies formed by the tabernaclework above are nine figures of angels, bearing the emblems of Our Lord's Passion. The cathedral authorities being desirous of decorating the interior of the niches of the reredos in order to throw the figures more into relief, and also of gilding the details of the tabernaclework, a communication on the subject was laid before the meeting of Provincial Grand Lodge at Stow-on-the-Wold in May last, and a committee was appointed to ascertain the views of the brethren of the province, and to take such action in the matter, by sanctioning the work or otherwise, as might seem to them desirable. The committee authorised as an experiment the decorating tentatively of a section of the reredos in the way proposed; and this having been done, and the work inspected, the committee approved of its effect, but decided to ask the Provincial Grand Master to relieve it of further responsibility by again referring the question to Provincial Grand Lodge. The proposal to accede to the request made for the decoration thus came forward for discussion at the meeting on Tuesday, supported by the approval of the committee, and endorsed by the unanimous vote of the Royal Gloucestershire Lodge of Gloucester, which promised twenty-five guineas towards the

cost of the work. Mr. Nelson Foster proposed that the decoration of the reredos be carried out in accordance with the plan approved by the committee at a cost not exceeding 300*l.*, and Mr. J. Walker seconded the proposition. An amendment was proposed by Mr. Gwinnett practically negating it, and this was seconded by Mr. Moore. The Provincial Grand Master expressed his opinion in favour of the decoration, and Mr. J. Winterbotham his against it. On a vote being taken, the amendment was rejected by a considerable majority, and the original resolution carried.

### TECHNICAL EDUCATION.

ON Wednesday Sir Lyon Playfair distributed the prizes to the students of the schools in connection with the City and Guilds of London Institute, and in addressing the assembly observed that when the Guilds were founded in the twelfth century they had a double purpose—first, to protect skilled labour against the encroachment of the feudal laws, the second purpose being more nearly related to that which they were now performing—to restore and develop lost arts and sciences, and to act as teachers to pupils. The word "guild" was a modern innovation. In their ancient charters the guild was called *universitas*—a word which at that time meant a teaching corporation, and it was applied as closely to a university of smiths, or tailors, or carpenters, with the same object and with the same right to use it, as to the Universities of Oxford and Cambridge. The whole idea was founded upon teaching. The apprentice was bound to learn and the master was bound to teach, and a better technical education for the period he could not conceive. The effect of the introduction of machinery was to make the guilds alter their functions altogether, and the relation of master and apprentice was by the same cause changed into the position of capitalist and workman. Machinery brought about a great subdivision of labour, by which the workman was relegated to one small corner of his industry, and did not know the whole mystery of his craft, as he did in the old days. Until recently, the City and Guilds Institute and other promoters of technical education arose, he had no means of dignifying his labour by understanding the whole field of the industry in which he was engaged. The ignorant workman woke one morning and found that a new machine had been invented which dispensed with his labour. He had learnt to do nothing else, and he was added to the large army of the unemployed, not having had the education to adapt himself to the dislocations of labour which were happening every day. The City and Guilds Institute had been formed to give men the opportunity of acquiring knowledge which would enable them to adapt themselves to the new order of things when such dislocations occurred. The competition of the world was becoming a competition of intellect, and if in any one branch we fell below that of a foreign country we should be beaten. The success of nations in the future would depend on the trained intelligence—or, in other words, the technical education—of their working men. The guilds had recognised the necessity of adapting themselves to the industrial progress of the world, and had shown their readiness to promote the industries which they were founded to promote. He considered that the country owed a great debt of gratitude to the City and Guilds Institute, which had set a noble example to the whole kingdom.

### GREEK STATUETTES.

FIFTY terra-cotta statuettes, which were found in the Greek cemetery of Myrina, on the north coast of Asia Minor, about thirty miles from Smyrna, have been lent to the Birmingham Art Gallery by Mr. George Dennis, the Consul-General at Smyrna. They range, says the *Birmingham Post*, from 3 inches to 10 inches in height. The majority of them were probably executed about B.C. 200; but there are some of a later period. It is, however, very difficult to assign a positive date to these terra-cottas. It is customary to attribute those which display the best art, without archaic features, to the earliest dates; those of coarser style, with less attention to detail, to the later period. It is rarely the case that terra-cottas found on the coast of Asia Minor have archaic features, which seems to indicate that the use of these figures as sepulchral furniture was not common in Asia Minor—at any rate in *Æolis*—at a very early period; indeed, their distinguishing features mark them as belonging to the decadence of Greek art, though most of the specimens show exquisite form and some are of exceptional beauty. The feeling, however, for plastic art, which the Greeks possessed in such a high degree, has here given place to a sense of the picturesque, and the sculptors have taken the figures from everyday life—walking, dancing, draperies flying in the wind, with little of that repose which stamps the finest period of Hellenic art. It will be noted



what dexterity of execution and what cleverness of construction these little figures possess. The arms of some are movable, some are evidently mere playthings, yet they are so admirable as to furnish artists and archaeologists with much ground for study. These little terra-cottas were evidently made in a mould, and the artist would remodel or retouch with the modelling tool the various details which could not be brought to perfection or sharpness by any mechanical process. Many of them, like the celebrated Tanagra statuettes, have been coloured; some of the tints still retain their original freshness. In order to colour them they were dropped in a bath of whitewash, and then tinted a pale pink, red, blue, and yellow, and where the colour has disappeared the original coat of whitewash may now be seen. On the shoulders of some of the figures are inscriptions, two or three letters marked in the clay whilst soft, which probably represented the name of the potter.

One of the most interesting figures is that of a woman dancing, gracefully poised on one foot, in the attitude of turning round; she wears a Doric chiton or tunic, which leaves, of course, the right leg bare. The figure is full of expression and vigour of movement, and the flow of the drapery is dexterously rendered. Another, of great beauty, is the figure of a woman leaning against a pedestal, with right hand on hip, whilst the left holds up the mantle or cloak. The head is encircled by a stephane or head ornament worn by a goddess, so well done as to indicate a fine period of art. Some of the figures of Eros, crowned with garlands of fruit and flowers, are excellent, and show a remarkable sense of movement. A figure of a youth, placed on the uppermost shelf, and wearing a short tunic and a chaplet of wool and flowers, is the best. The figure of a winged Victory, with the right arm extended, holding a wreath and wearing a Doric chiton, may be assigned to a late period; the modelling is defective and "scamped." A figure of interest to the archaeologist, and possibly to the dramatist, is that of an actor wearing his mask. Few statuettes of this kind have been found, though at Berlin are three or four admirable examples of the kind from Tanagra. The actor wears a long mantle and a chaplet of flowers and wool; the mask, with a broad grin, and the flowing beard are finely modelled, and the purpose of illusion is fully achieved. Next to this is an exquisite seated figure—only 4 inches high—of a girl wrapped in a cloak, and leaning against a Hermes. This little figure, of great refinement, closely resembles the Tanagra works, as, indeed, do most of those fully clothed. Together with this figure of the seated girl should be noted the poetical little figure of Eros, muffled, and with extended wings. It may be hoped that this interesting collection will be secured as a permanent addition to the gallery.

#### AN IRISH CHURCH.

THE following remarkable statement is by the rector of Ovoca:—

I have noticed for the last three years that there was a considerable amount of damp in the walls and tower of Ovoca Church, and on drawing attention to the fact I was told that there must be something wrong at the roof of the tower, and possibly at the down-spouts, but nothing more than could be easily rectified, or if not this, that the new mortar was merely drying out; and so, waiting a favourable opportunity to have the matter investigated, and not knowing but the latter might be the case, and having very much to do of parochial work in a new parish, I put off the inspection till I could have the damage properly attended to, as we were soon to have our schoolroom repaired. In the meantime, particularly during wet weather, we saw that there must be something radically wrong, or there could not be so much damp visible; and at the visitation before the last I thought right to mention this, when we determined to have a professional inspection of the church.

The consecration dates from 1870—only eighteen years ago—and so the church is practically new, and it is this new appearance which has deceived many as to its true condition. The building cost, I believe, 3,300*l.*, and the church is one of the handsomest in Ireland.

In the spring of this year I had an inspection made by two practical builders, but during last winter I knew enough to satisfy me that the case was much worse than any one thought, for the ceiling of the vestry-room had in part fallen, disclosing the rotten rafters overhead.

The inspection justified our worst suspicions, and we found all the woodwork in the vestry-room, which is under the tower, perfectly rotten. My health, unfortunately, with constant work, could not carry me through the summer; so, much against my wish, I had to postpone this important matter and recruit at the seaside. On my return in September, when I had workmen at the church doing some improvements, I examined with them the roof, and we found that two of the principals had begun to rot. I then asked Mr. Fuller to come

and make a report, which I enclose. The result was worse than before. The tower has four storeys. Of these the floors of three are quite rotten, and before long there will not be a sound plank in the whole tower. The damp, which has already reached the roof, will spread, and I am assured that in less than a good lifetime from the present the church—built only eighteen years—will be simply a ruin if the present state of things is allowed to continue.

To avert this I think it is my plain duty to call attention as publicly as I can to the facts. The cause of the damage is as follows:—When the church was built it was not allowed time to settle, as every building requires, but the pointing was done in cement while the scaffolding was being taken down. The church walls then settled, and the pointing of course broke. The rain beating against the walls enters the cracks and destroys all before it.

If the whole outside of the tower and church is pointed anew, the walls will be safe for the future, but this will cost over 300*l.* As it is, the parish has suffered so many losses, the mines are idle, many people have left, and those who are here, while very willing to help, have not the means to do all this most necessary work. If we erect a scaffolding it is about as much as we can do. The church was built when all the mines were going, and every one was well off, but now things are altered greatly.

If the work is not done one of the finest churches in Ireland will fall into ruin.

[Copy of the Architect's Report.]

I have inspected Castlemacadam Church, as requested by the rector. Much injury is being done by the want of proper staunching of masonry. The two gables at the west end are suffering seriously from damp, which is of course affecting the adjoining roof timbers. Damp also shows at the south-east angle near the chancel arch, and the timber which is in contact with the wet masonry is beginning to decay. The vestry is in a deplorable state. The floor has sunk, which shows that the plates under joists—if not the joists also—have rotted. The joists of the ceiling, particularly on east side, are rotten, and the wall plaster is either off or falling off. On an upper stage of the tower one of the main beams on which the floor is carried is seriously decayed. This state of things should not be allowed to continue. Steps should be taken this spring to cure the defects.

J. F. FULLER, F.S.A., Architect.

#### KIRKSTALL ABBEY.

AT the conclusion of the sale of the Cardigan Estates, the auctioneer, Mr. Chinnock, said he had an intimation to make which he was sure would give the company great pleasure, and that was that Kirkstall Abbey had been sold privately, and though he was not at liberty to mention the name of the purchaser, he could tell them that it had fallen into very good hands. He did not know what to say about the Leeds Corporation, except that they should be a little bit quicker, and adapt themselves more to the times. They had lost a splendid chance. The gentleman who had bought the Abbey, Mr. Chinnock added, was acting on behalf of several gentlemen of the town. It subsequently transpired, says the *Leeds Mercury*, that a contract had been drawn up between some gentlemen and the vendors for the sale of the Abbey and the Abbey House at the reserve price. Mr. Edmund Wilson was informed of the fact by telegram, and he immediately, on his own responsibility, purchased the two estates for 13,500*l.* Mr. Wilson was compelled to take this step on the spur of the moment, without consultation with any one else interested. Otherwise the Abbey would have passed into other hands. It will be remembered that the reserve price put on the Abbey the other day was 10,000*l.*, and on the Abbey House 3,500*l.*, so that the vendors have succeeded in getting the full amount. We are not in a position to state what will be done with the properties, but the public will be delighted to learn that the venerable ruins of Kirkstall have fallen into the hands of Leeds gentlemen in whose care they will not be allowed to suffer.

#### GREEK EXCAVATIONS.

THE Winckelmann anniversary was celebrated on Friday night (writes the Athens correspondent of the *Standard*) at the German Archaeological Institute in that city, when Dr. Dörpfeld, the principal, delivered an important address to a brilliant audience on the results of recent excavations in Greece as bearing on the history and development of ancient art. Dr. Dörpfeld, who, with Dr. Schliemann, has made a special study of the discoveries at Mycenæ, Tiryns, and Orchomenos, proceeded to enumerate the relics of prehistoric palaces and other edifices recently brought to light in the territories inhabited by



the ancient Greeks. On examination and comparison with other ancient monuments, these remains showed an unmistakable resemblance to ancient Asiatic architecture, while at the same time they were not dissimilar to the Hellenic temples of later periods. Dr. Dörpfeld holds that the ancient Greeks borrowed their different styles from Egypt and from several of the ancient peoples of Asia. The builders of the Mycenaean period were, he believed, Phoenicians. The remains of the edifices at Mycenæ and Tiryns bore a wonderful resemblance to the Jewish Temple at Jerusalem.



#### Longton Cottage Hospital Competition.

SIR,—Will you afford us space for protest against another unsatisfactory competition? The above-named was limited by special invitation to some seven or eight local architects, amongst whom we had the misfortune to be included. At the outset we obtained a conditional promise that an assessor should be appointed, or we should not have entered the competition. In due course the secretary apprised us officially of the assessor's appointment, and in reply we wrote expressing satisfaction that the trustees had adopted this course. Later (November 28), he informed us:—"The trustees have now decided upon two sets of drawings to select from, viz., Mr. Ford's and Mr. Taylor's." (He added, "It only remains to say that your plans are at your disposal, and may be removed by you whenever it suits your convenience.") Now from inquiries that have since been made the following facts have been ascertained:—(1) The assessor never saw any of the designs sent in, except those of the two favoured competitors already named, the plans of the other invited competitors being virtually suppressed. (2) The two favoured competitors had access to view the whole of the designs before the assessor entered upon his duties. On the other hand, the unfavoured competitors (such as ourselves, Mr. Lynam, and all the rest), some of whom had asked for, or been promised, that privilege, were never allowed to see the designs at all. Comment appears needless.—We are, yours truly, W. SUGDEN & SON, Leek: December 18, 1888.

#### Cash on Delivery.

SIR,—An instance has recently come before me of a consignment being sent from the Continent by this Company's Harwich route with a considerable disbursement, or "Paid on," and, although the consignee knew nothing of the case, he accepted it, paying the charges. When the package was opened, the contents were found to be of little value, and had never been ordered. The consignee thereupon applied to my Company to refund the disbursement and the charges, but, according to the Continental law, acceptance of goods, and payment of the charges, forfeits any claim against the sender. The proper course would have been for the consignee to refuse acceptance until he had satisfied himself that it was a bona-fide transaction. I shall be glad if you will insert this letter in your paper as a caution to the public against accepting goods on which there are heavy "paid on's" or other charges, and which they do not expect, as this season of the year is particularly favourable to such transactions, on account of the numbers of presents that are being received.—I am, Sir, your obedient servant, F. GOODAY.

Continental Traffic Manager, Great Eastern Railway  
Liverpool Street: December 15.

#### SCHOOL BUILDINGS.

**Stratford.**—New Sunday-schools in connection with the Congregational church have been opened. The schools are built at the rear of the church, with which and the adjacent lecture-room they are connected by means of corridors. Accommodation is provided for about 350 scholars. The buildings have been most substantially constructed of brick, with stone dressings, by Mr. Stanton, of Evesham, from the designs of Mr. T. T. Allen, architect, of Stratford, the total cost being between 600*l.* and 700*l.*

**Shrewsbury.**—The Congregational Sunday-schools have been reopened after extension from the plans of Mr. A. B. Deakin, Shrewsbury. The new buildings, which are built of red brick, with stone dressings and moulded Ruabon brick string-courses, consist of the extension of the schoolroom 10 feet wide, making the size of the room 50 feet by 40 feet, the enlargement of the classrooms over the schoolroom, and the erection of a new wing on the ground-floor, containing infants' schoolroom, library, china closet, lavatory, and other con-

veniences, entrance-hall with stone staircase, and six new classrooms over. A house with all necessary conveniences has also been built for the accommodation of the caretaker. The building is heated with hot water by Mr. Jackson, of Newcastle, and ventilated by Kershaw's pneumatic ventilators and fresh-air inlets. The work has been carried out under the superintendence of the architect, by Mr. Thomas Morris, builder, St. Austin's Friars, and both these gentlemen have carried out their duties in a thoroughly efficient manner. The large schoolroom is lighted by five of the patent Wenham lamps, and the whole of the gasfittings have been rearranged by the Shrewsbury Gaslight Company. The painting was done by Mr. Stanley, Shrewsbury, and the glazing by Messrs. Ravenscroft & Mansell.

#### NEW BUILDINGS.

**Bank of England Branch, Fleet Street.**—The new building near the Law Courts, erected on the site of the Cock Tavern and adjoining buildings, was opened on Monday. The style is Italian. The building has a frontage to Fleet Street of 80 feet and an area of 4,000 square feet. It contains three lofty storeys, besides a deep basement floor, and is surmounted at the south-east and south-west angles by prominent towers, rising to a height of 70 feet. In sinking for the foundations the London clay was reached at a depth of from 18 feet to 20 feet below the street level. The basement walls are formed of blocks of dark Aberdeen and Cornish granite, between 3 feet and 4 feet in thickness, rising to a height of several feet above the ground line. The two elevations are faced with Portland stone, and decorated by the introduction of Shap and Peterhead polished granite columns. The principal entrance to the bank is under an archway and porch at the west end, about 9 feet in width, the entrance being fitted with ornamental iron gates, in the centre of which is the inscription "Bank of England." The banking-house, with the adjoining offices, occupies the whole of the ground floor, being 70 feet in length and 40 feet in width. The floor of the public part is laid in mosaics by Messrs. Burke & Co. The upper floors will be occupied as the manager's residence. The strong-rooms are in the basement, and are entirely enclosed within walls built of Staffordshire blue brick, consisting of several courses, each course being intersected and bound by strong hoop-iron. Messrs. Hobbs, Hart & Co. have supplied the safes and iron doors and grilles. The building will be lighted by electricity as well as gas. The premises has been erected from the designs of Mr. A. W. Blomfield, M.A., A.R.A., architect, Messrs. Dove Bros. being the contractors. The cost of the site was about 35,000*l.*, the foundations and basement cost 17,000*l.*, and the superstructure nearly 45,000*l.*

**Alloa.**—The town-hall and library presented to the town of Alloa by Mr. Thomson Paton, of Norwood, has been opened. The buildings are Gothic in style. They are built of sandstone, and present externally an imposing appearance, forming an important addition to the architectural features of the town. Mr. Alfred Waterhouse, R.A., is the architect, and under his direction a structure has been erected which, while it is picturesque so far as its exterior is concerned, is commodious and attractive inside. The style of architecture is a broad treatment of domestic Gothic. The building consists of two portions, one four storeys in height, and covering nearly the whole width of the site towards Church Street; and the other two storeys in height, extending backwards at right angles from the front portion. The library, reading, and recreation and classrooms are to the front, while the town-hall occupies the whole back portion. The central block of the front part projects beyond the general building line. The upper part is broken off with pilasters, and the centre terminates with an ornamental gable top. The main entrance is through a large semi-circular headed doorway in the centre of the front. It gives access to a handsome hall that rises right through the building to the roof. The main staircase leading to the various floors ascends at an easy gradient, and is lighted from the well. At the height of the second floor there are polished Peterhead granite columns. The walls of the vestibule and entrance hall throughout are covered with glazed Burmantofts faience in subdued artistic colours. There are large semi-circular arches at each side of the commencement of the staircase, and elliptical arches of various sizes are worked into the design at various parts of the staircase. Light for the hall is derived from the roof through a glass ceiling painted in conventional designs. The first flight of steps leads up to the mezzanine or entresol floor, from which the reading and billiard-rooms are entered. They are both spacious apartments, capably lighted from large windows which extend almost from floor to ceiling, and form one of the chief features in the front of the building. Oak galleries extend round three sides of each room at a height of 10 feet from the floor, and are lined with bookcases, while in the reading-room there are other cases containing books for reference placed round the lower portion of the apartment. Each room measures



32 feet by 19 feet. The librarian's-room is situated on the first floor, in a position from which easy access can be had to the galleries. The science and art classrooms occupy the other floors of the front building. The town-hall is a very handsome oblong apartment with covered roof, which has been so well arranged that from every seat in it a good view can be had of the platform. A large organ has been fitted up in it, and the walls and ceiling, the latter of which has been divided into compartments with heavy Gothic mouldings, have been decorated from designs prepared by the architect.

**Ditchingham.**—On Tuesday last a new mission-house was opened at Ditchingham, Norfolk. It consists of one room, 50 feet by 24 feet, easily divisible by a movable partition. Attached to the room is a small residence for two sisters in charge, and a small oratory. The roof of mission-room is of pitch-pine, and has trusses with cut queen-posts and wave boards. It is brick built, part half-timbered, and rough cast, and has cost 1,050*l*. This makes the eighth building erected by the All Hallows community since their settlement in this parish in 1859, when they built the House of Mercy. Since that time they have built two orphanages, a country hospital, and a priest's house. Since the year 1876 the Community House (a residence for the community), Holy Cross House (a memorial wing to the late Rev. W. E. Scudamore), and this mission-house have been erected, from designs and under the superintendence of Mr. Augustus Frere, F.R.I.B.A., London, the whole work having been ably carried out by Mr. Robert Morriss, builder, Ditchingham.

**Birmingham.**—At the expense of Mr. J. C. Holder some important additions have been made to the structure of the hospital (one of the oldest in the country, having been erected about the year 1780), with a view to improve the lavatory arrangements of several of the wards. The work consists of lavatory annexes to two of the pavilions containing the wards. The new building may be described as square towers with the angles taken off, forming on plan an irregular octagon, each being four storeys high, connected with the block to which it belongs by intercepting lobbies to secure independent ventilation. In each floor of the towers is a bath-room, lavatory, water-closet, and a wash-up sink, each with its separate enclosure for privacy. The floors are covered with sheet-lead. The walls have a high dado of white tiles, the upper part being cemented. Hot and cold water are supplied throughout, and the whole of the hydraulic and draining arrangements are in accordance with the best sanitary knowledge of the present day. In addition to the above gift, Mr. Holder has also defrayed the cost of ventilating the main drains, a work urgently required. The works have been executed in the best and most substantial manner by Mr. James Moffat from the designs of Messrs. Yeoville Thomason & Whitwell, architects, of Cannon Street, Birmingham.

**Saltash.**—The Cottage Hospital and Convalescent Home of St. Barnabas, built by the munificent generosity of Mrs. Ley, of Claremont, Saltash, was opened on Tuesday, December 11. The building occupies an elevated site in Upper Port View Road, commanding extensive views of the Hamoaze and neighbourhood. It is built of red brick, tile hung, with half-timbered oakwork. A conspicuous feature is the circular end of the chapel on the east side. Internally no expense has been spared to make the arrangements as perfect as possible. The whole of the east end of the building is occupied by a chapel. It is apsidal in form, and the interior is of red Berkshire brick, relieved by stone dressings and labels, the archery over the windows being of rubbed gauged brickwork. The roof is barrel-vaulted. The chapel is lighted by seven tracery-headed windows, three of which are filled with coloured glass. Seating accommodation will be provided for 24 persons. At one end of the chapel is a small gallery on a level with the upper landing, from which it is separated by a glazed screen. It is intended for the use of patients in the upper wards who may be too weak to walk down stairs. On the north side is an arched recess for the harmonium. In the opposite wall are two sliding lights, which, when open, will enable the inmates of the male wards to hear the singing in the chapel. Near the organ recess has been hung the dedication picture, depicting St. Barnabas, painted by Mr. E. Fellowes Prynne. When completed there will be a division between the sanctuary and the nave, and the panels on the walls will be decorated. On the basement are a heating chamber, kitchens, scullery, ice-house, laundry, and mortuary. As the ground slopes to the south, the basement rooms are not underground and gloomy, but well lighted and cheerful. Special attention has been bestowed on the sanitary arrangements, which are made as perfect as possible. Each ward has its own lavatory and other conveniences, and there are no drains running under the building, all the pipes being carried away on the outside and ventilated. The whole building is heated by hot-water pipes, supplied by Bennett Bros., Liverpool, and the wards are fitted with Messrs. Malcolm, Tester & Co.'s pneumatic bells. There is also a lift communicating with the upper landing. A good supply of water is

obtained from a well on the premises. The work has been substantially carried out by Mr. R. W. Rowse, builder, of Mutley, from the designs of Mr. George Fellowes Prynne, architect, of London and Plymouth. Inclusive of the site, the cost has been about 4,500*l*.

**Birmingham.**—The ceremonial opening of the new work-house infirmary is fixed to take place on January 9 next. The infirmary is one of the largest in the world. The guardians determined that they would erect a plain substantial building, without unnecessary ornamentation, but that it should be fitted up in the best possible known way to insure its efficiency for the work it would be called upon to do. With this end in view they appointed a deputation of four of their number, namely, Mr. E. J. Stout, Dr. Barratt, Mr. Price, and Mr. Jerrett, who, with the architect, Mr. Ward, were instructed to visit any institution in the kingdom they thought advisable, and to "gather up," as it were, all the good things they could find in the way of appliances, fittings, machinery, &c. They accordingly visited a large number of public institutions in England and Scotland, and availed themselves largely of the opportunities given to them for this purpose. The result has been that an infirmary has been erected which, the guardians believe, is one of the most perfect in the kingdom. The cost will be about 85,000*l*. exclusive of the land, which was already the property of the guardians. Some portion of the old infirmary will be joined to the new building, and accommodation will be obtained for 1,700 beds, allowing 1,100 cubic feet of space for each bed, and 2,400 feet per bed at the infectious block.

### CHURCH BUILDING AND RESTORATION.

**Strathpeffer, N.B.**—A new church for the use of the members of the Established Church and the large number of visitors who annually visit the parish is to be erected at Strathpeffer. Plans have been prepared by Mr. Jones, architect, of a building capable of accommodating 600 persons, and these have been adopted by the Presbytery. The church, which is to be erected on a site in front of Kinnetas House, will cost 2,500*l*. or upwards. Grants have been promised from the Baird Trust, the Highland Committee, the Home Mission Scheme, and friends of the church. The erection of the church will, it is expected, be commenced early in the new year.

### GENERAL.

**Mr. Milo Griffith** was the designer of the silver shield presented by the people of South Wales to the Prince and Princess of Wales in commemoration of their silver wedding.

**The War Office** authorities have purchased several acres of ground situated between Epping and Ongar, as a site for the erection of military barracks. The spot selected is on high land, only a short distance from the Ongar branch of the great Eastern Railway. The barracks will provide accommodation for five thousand men, and the work of erection will commence immediately after Christmas.

**A Bridge** is to be constructed across the river Danube in connection with the Fetesci-Cernavoda Railway. The plans have obtained the sanction of the Roumanian Minister of Public Works.

**The Architect** employed to repair Seville Cathedral reports that the condition of one if not more of the pillars justifies serious alarm for the safety of a large portion of the edifice. Energetic measures are being adopted to shore up the faulty pillars.

**A Theatre** is about to be erected on the site of the old Gaiety Theatre, Douglas, Isle of Man, for Mr. James H. Elphinstone, from the designs of Mr. John Taylor, architect, of Longton, Staffs.

**A New Lecture Hall** has been erected at Sunderland, and special attention has been paid to the ventilation, which is carried out on Messrs. Boyle's system, the extraction of the vitiated air being effected by the latest improved form of the patent self-acting air-pump ventilator, and fresh air admitted through their improved air inlets.

**A Preliminary Plan** for the erection of a public hall and hotel at Montrose has been laid before the Town Council. The cost of the buildings is roughly estimated to be between 12,000*l*. and 15,000*l*.

**The Parish Church of Wistaston, Cheshire**, has been redecorated and the sanctuary provided with a new reredos, sedilia, wainscotting, and mosaic floor. Mr. John Brooke designed the work.

**A Site** for the proposed cottage hospital at Forres has been acquired. The subscription fund at presents amounts to nearly 2,500*l*.

**The Blake Memorial**, a stained-glass window placed in the north aisle of St. Margaret's Church, Westminster, was unveiled on Tuesday.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, DECEMBER 21, 1888.

## THE ARCHITECT AND CONTRACT REPORTER.

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No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

### COMPETITIONS OPEN.

SCARBOROUGH.—March 1.—Designs and Estimates are invited for Laying-out Portion of the Corporation Landed Estate called Weapონness Valley. Premiums of 150l. and 50l. respectively offered. Mr. Joseph Petch, Borough Surveyor, Town Hall, Scarborough.

SOUTHAMPTON.—Feb. 1.—The Executors of the late Mrs. Harriett Bellenden Sayer invite Designs for Drinking Fountain to be erected at Southampton. Premium of 20 guineas. Messrs. Sharp, Harrison, Turner & Turner, Solicitors, Southampton.

ST. THOMAS.—Jan. 2.—Plans and Elevations are invited for the Erection of Board Schools. Mr. J. Champion, Clerk to the School Board, St. Thomas, near Exeter.

YORK.—Feb. 16.—Designs, &c., are invited for the Erection of Courts of Justice and Police and Fire Brigade Stations. Premiums of £100, £50, and £25. Mr. George McGuire, Town Clerk, Blake Street, York.

### CONTRACTS OPEN.

ABERTILLERY.—Jan. 5.—For Sinking 14-feet Pit for the Tillery Coal Company. Colliery Offices, Abertillery.

AUDENSHAW.—For Building Cotton Wadding Mill and Chimney. Mr. J. H. Burton, Architect, Warrington Street, Ashton-under-Lyne.

BARNOLDSWICK.—Dec. 29.—For Building Weaving Shed for the Calf Hall Shed Company, Limited. Mr. W. H. Atkinson, Smith's Chambers, Colne.

BELFAST.—Dec. 21.—For Reconstruction of Shop and Premises, Donegall Place. Mr. James J. Phillips, Architect, 21 Arthur Street, Belfast.

BLAENAVON.—Jan. 1.—For Single-lift Gasholder (50 feet by 18 feet) with Cast-iron Columns, Wrought-iron Lattice, Girders, &c. Mr. C. White, Manager, Gas and Waterworks Office, Blaenavon.

BLAINA.—Dec. 24.—For Building Wall near Pontygwellwch Bridge. Mr. G. Stevens, Surveyor, Blaina.

BRIGHTON.—Dec. 31.—For Erection of Two Blocks of Infirmary Buildings and Enlargement of Infants' Ward at the Workhouse. Mr. B. H. Nunn, Architect, 129 Queen's Road, Brighton.

CADOXTON.—Dec. 21.—For Laying-out Paths, Erection of Entrance Gates at new Cemetery. Mr. S. W. Richards, Architect, 10 Church Street, Cardiff.

CARMARTHEN.—Dec. 24.\*—For Building Church of St. John. Messrs. Middleton, Prothero & Phillott, Architects, 1 Bedford Buildings, Cheltenham.

DARLINGTON.—Dec. 27.—For Iron Roof and Additions to Swimming Baths. The Borough Surveyor, Town Hall, Darlington.

DARWEN.—Jan. 31.—For Three Purifiers, with Pillars and Girders. Mr. P. Duxbury, Gas Engineer, Charles Street, Darwen.

DURHAM.—Dec. 28.—For Works of Heating (Low Pressure System) at Workhouse, Crossgate. Mr. W. Crozier, jun., Shire Hall, Durham.

FALKIRK.—Dec. 27.—For Construction of Works of Water Supply. Mr. R. Copeland, C.E., 146 West Regent Street, Glasgow.

FAREHAM.—Dec. 21.—For Additional Pumps and Gearing to Waterworks Engines. Mr. Leonard Warner, Clerk to the Local Board, Fareham.

FARNHAM.—Jan. 8.—For 3-inch Cast-iron Socket Water Pipes and Castings (490 yards), coated with Dr. A. Smith's Patent Varnish. Mr. W. Wells, 112 West Street, Farnham.

FINSBURY PARK.—Jan. 8.—For Recessing Gates and Piers Blackstock Road Entrance. The Architect, Metropolitan Board of Works, Spring Gardens, S.W.

FLEETWOOD.—Dec. 31.—For Additions to Board Schools, Blakiston Street. Mr. T. Garnett, Architect, Pharos Street, Fleetwood.

GLASGOW.—Dec. 24.—For Two Sets of Four Purifiers, Tradeston Gasworks. Mr. Wm. Foulis, C.E., 42 Virginia Street, Glasgow.

GLASGOW.—Dec. 31.—For Temporary Bridge over the Kelvin, Removing Old and Erecting New Bridge of Iron and Steel, with Stone Abutments, &c. Messrs. Miller & Bell, C.E., 204 St. Vincent Street, Glasgow.

GUILDFORD.—Jan. 12.—For Construction of Swimming and other Baths. Mr. H. Peak, Borough Surveyor, Guildford.

HAWARDEN.—Jan. 1.—For Construction of Railway Bridges and Earthworks. Mr. F. G. Whitwham, 8 Draper's Gardens, Throgmorton Avenue, E.C. Plans at the Engineer's Office, Old Vicarage, Wrexham.

\* Names and addresses to be forwarded not later than date.



HEADINGLEY.—Dec. 24.—For Building Twenty-six Scullery Houses. Mr. Joseph J. Morley, 6 Wormald Row, Leeds.

IPSWICH.—Jan. 1.—For Building Parcel Sorting Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

KENDAL.—Jan. 2.—For Building Terrace of Seven Houses. Mr. Gerrard Huck, Architect, 16 Lowther Street, Kendal.

KENDAL.—Dec. 22.—For Building large Warehouse and Four Model Dwellings in Two Semi-detached Blocks. Mr. Stephen Shaw, Architect, Kendal.

KING'S LYNN.—Jan. 2.—For Building Fever Hospital, Horsley's Chase. Mr. E. J. Silcock, Borough Surveyor, King's Lynn.

LEEDS.—Dec. 22.—For Building Business Premises. Mr. Walter A. Hobson, Architect, 82 Albion Street, Leeds.

LEWISHAM.—Dec. 28.—For Works in connection with Colfe's Grammar School, for the Leathersellers' Company. Mr. E. Lyne Parsons, Architect, 236 High Street, Exeter.

MORLEY.—Dec. 29.—For Building Mission Chapel for St. Mary's Congregational Society. Mr. T. A. Buttery, Architect, Queen Street, Morley.

PADSTOW.—Dec. 28.—For Restoration of Chancel of Parish Church. Messrs. R. Langford & Son, North Quay, Padstow.

PENRITH.—Jan. 12.—For Execution of Works of Water Supply for Three Villages. Mr. Watson, Engineer, St. Andrew's Place, Penrith.

ROTHERHAM.—Dec. 28.—For Works in the Erection of Public Market Hall. Mr. Archibald Mill, 19 East Parade, Leeds, or the Borough Surveyor, Rotherham.

SHEFFIELD.—Dec. 21.—For Extension of Canal Warehouse. The Engineer, 28 London Road, Manchester.

SHEFFIELD.—Jan. 7.—For Resheeting Two-lift Gasholder, and Enlarging same. Mr. Fletcher W. Stevenson, Engineer, Gas Offices, Commercial Street, Sheffield.

SHIPLEY.—Dec. 31.—For Construction of Abattoir. Mr. Samuel Jackson, Architect, 33 Kirkgate, Bradford.

SIDMOUTH.—Dec. 27.—For Building Two Shops and Premises for Messrs. Pepperell & Macer. Messrs. Kerley & Ellis, Architects, Exmouth and Old Fore Street, Sidmouth.

STORRINGTON.—Dec. 31.—For Steam-Cooking Apparatus for 100 persons for the Thakeham Union. Mr. W. T. Sandford, Clerk to the Guardians, Storrington, Sussex.

WEST BROMWICH.—Dec. 24.—For Cornish Boiler with Fittings complete, at the Workhouse. Mr. H. J. T. Piercy 53 Broad Street, Birmingham.

## TENDERS.

### AUDENSHAW.

For Sewering, Paving, Kerbing, and Flagging Martin Street, Bridge Street, Mount Pleasant Street No. 1, and Mount Pleasant Street No. 2, Audenshaw. Mr. J. H. BURTON, Surveyor, Warrington Street, Ashton-under-Lyne.  
WORTHINGTON & POWNALL, Manchester (accepted per schedule of prices).

### BEDFORD.

For Erecting New Tower and Copper House, and Alterations to Old Buildings, at the Horne Lane Brewery, for Mr. C. Wells. Mr. ARTHUR KINDER, Architect, Suffolk House, Lawrence Pountney Hill, E.C. Quantities by Mr. Alexander H. Kinder, 34 Clements Lane, E.C.  
T. Spencer, Bedford . . . . . £1,379 0 0  
W. Haynes, Bedford . . . . . 1,351 0 0  
Warton & Walker, Bedford . . . . . 1,326 0 0  
Freshwater & Sons, Bedford . . . . . 1,315 0 0  
S. FOSTER, Bedford (accepted) . . . . . 1,315 0 0

### BUILTH.

For Building Semi-detached Villas, Builth. Mr. S. H. COWPER-COLES, Architect, Builth.  
H. Owen, Builth . . . . . £760 0 0  
J. M. Jones, Builth . . . . . 720 10 0  
MEREDITH, Newbridge-on-Wye (accepted) . . . . . 708 0 0

### CALVERLEY.

For Building Five Through Houses and Boundary Walls, Ravenscliffe Road, Calverley. Messrs. JOWETT KENDALL & J. HARPER BAKES, Architects, Idle.

### Accepted Tenders.

J. Thornton, Idle, mason.  
W. Baker, Idle, joiner.  
S. Scott, Idle, plumber and painter.  
Hollings & Mitchell, Idle, plumber and painter.  
T. & A. Thornton, Eccleshill, slater.

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## CARLISLE.

For Erection of Temporary Butter Market, Carlisle.

R. H. &amp; H. Hodgson . . . . . £285 0 0

## COLCHESTER.

For Erection of New Grain Store, East Mills, Colchester, for Messrs. C. Marriage &amp; Son. Mr. J. F. GOODEY, Architect, Colchester.

A. Diss, Colchester . . . . . £2,460 0 0

H. Everett &amp; Son, Colchester . . . . . 2,317 0 0

G. Grimwood &amp; Son, Sudbury . . . . . 2,295 0 0

G. Dobson, Colchester . . . . . 2,288 0 0

F. Dupont, Colchester . . . . . 2,275 0 0

W. A. Chambers, Colchester . . . . . 2,179 0 0

For Erection of New Currier's Factory, Factory Lane, Colchester, for Messrs. F. Warmington &amp; Co. Mr. J. F. GOODEY, Architect, Colchester.

C. E. Orfeur, Colchester . . . . . £2,100 0 0

H. Everett &amp; Son, Colchester . . . . . 2,000 0 0

W. A. Chambers, Colchester . . . . . 1,889 0 0

G. Grimwood &amp; Son, Sudbury . . . . . 1,870 0 0

G. Dobson, Colchester . . . . . 1,830 0 0

H. Ambrose, Colchester . . . . . 1,825 16 0

A. Diss, Colchester . . . . . 1,760 0 0

F. Dupont, Colchester . . . . . 1,735 0 0

For Erection of Four Cottages, West Mersea, for Mr. H. Mussett. Mr. J. F. GOODEY, Architect, Colchester.

W. Shead, Berechurch . . . . . £711 0 0

G. Dobson, Colchester . . . . . 694 0 0

F. Dupont, Colchester . . . . . 615 0 0

H. Ambrose, Colchester . . . . . 605 15 0

A. Diss, Colchester . . . . . 585 0 0

C. E. Orfeur, Colchester . . . . . 537 0 0

## CROMER.

For Deepening No. 1 Well at Cromer, for the Cromer Waterworks Company, Limited. Mr. J. C. MELLISS, C.E., Engineer, 232 Gresham Street, Old Broad Street.

J. Villiers, Beverley . . . . . £1,236 0 0

E. Timmins, Runcorn . . . . . 949 0 0

L. Hills &amp; Co., Old Street . . . . . 622 0 0

T. TILLEY &amp; SON, Walbrook (accepted) . . . . . 475 17 6

## DINORWIC.

For Alterations and Additions to Farmhouse, Cae Glas, Vynol Estate. Mr. J. P. MUMFORD, Architect, Llanrug, Carnarvon.

H. Griffiths, Port Dinorwic.

H. Williams, Port Dinorwic.

O. Owens, Cwm-y-Glo.

E. Evans, Cwm-y-Glo.

E. Roberts, Cwm-y-Glo.

W. ROBERTS, Llanrug (accepted).

For Building Farmhouse, Aclwyd Ucha, Dinorwic, Vynol Estate. Mr. J. P. MUMFORD, Architect, Llanrug, Carnarvon.

Evan Roberts, Cwm-y-Glo.

W. Roberts, Llanrug.

For Building Farmhouse, Pen-y-Bwlch, Dinorwic, Vynol Estate. Mr. J. P. MUMFORD, Architect, Llanrug, Carnarvon.

W. Chassen, Cwm-y-Glo.

H. Williams, Port Dinorwic.

E. Roberts, Cwm-y-Glo.

H. Griffiths, Port Dinorwic.

W. Roberts, Llanrug.

## ESKDALE.

For Building House, Boundary Walls, &amp;c., at Randall How, Eskdale. Mr. J. S. MOFFAT, Architect, 53 Church Street, Whitehaven.

## Accepted Tenders.

C. Pharaoh, Holm Rook, Carforth, mason and brickwork.

J. Martindale, Cleator Moor, carpenter and joiner.

T. Mandle, Maryport, slating, tiling, and plastering.

W. Strathern, plumbing and glazing.

Fox &amp; Fitzsimons, Newtown, Whitehaven, painting.

## HALIFAX.

For Building Six Houses, Booth Town, Halifax. Mr. JOSEPH F. WALSH, M.S.A., Architect. Quantities by Architect.

## Accepted Tenders.

Fearnley &amp; Firth, Halifax, mason.

Samuel Greenwood, Halifax, joiner.

Clayton Bros., Halifax, plumber and glazier.

Rushworth &amp; Firth, Halifax, plasterer and slater.

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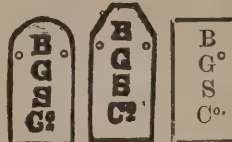
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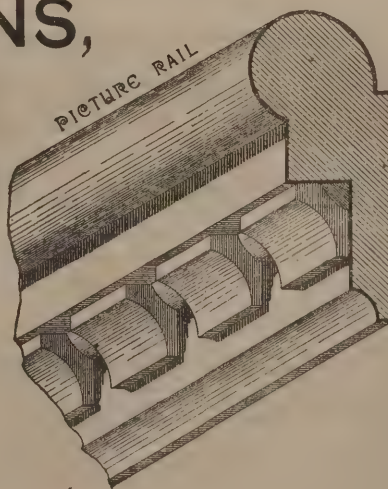
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**HALIFAX—continued.**

For Additions to the Liberal Club, Lightcliffe, near Halifax.  
Mr. JOSEPH F. WALSH, M.S.A., Architect.

*Accepted Tenders.*

Thomas Dawson, Lightcliffe, mason and bricklayer.  
Michael Woodhead, Lightcliffe, carpenter and joiner.  
William Travis, Hipperholme, plumber and glazier.  
Tedber Lister, Hipperholme, plasterer and slater.

**LEEDS.**

For Building Block of Buildings, Leeds. Mr. D. DODGSON,  
Architect, 17 Park Row, Leeds.

*Accepted Tenders.*

J. Tomlinson & Son, Leeds, joiner and carpenter.  
W. Evans, Leeds, bricklayer and mason.  
Topham & Skirron, Leeds, plumber and glazier.  
A. Mansden, Leeds, plasterer.  
J. Season, Leeds, slater.  
J. Blackburn, Leeds, painter.  
J. Bagshaw & Son, Batley, ironfounder.

For Building Five Through Houses and Shop, Leeds. Mr.  
W. S. BRAITHWAITE, Architect, South Parade, Leeds.

W. & G. Pardy, Leeds, bricklayer and mason.  
J. Ledger, Leeds, joiner.  
Stead & Noble, Leeds, plumber.  
Wm. Pennington, Leeds, plasterer.  
J. Atkinson & Son, Leeds, slater.

For New Shop Premises, Briggate and Commercial Street,  
Leeds. Mr. W. S. BRAITHWAITE, Architect.

Gould & Stevenson, Leeds, joiner, mason, and bricklayer.  
John Fox, Leeds, plumber.  
J. P. Mountain, Leeds, plasterer.  
James Season, Leeds, slater.  
C. H. Taylor, Leeds, ironfounder.

For Building Board School, Stanningley, Leeds. Mr. W. S.  
BRAITHWAITE, Architect.

Winterburn & Thackeray, Leeds, mason and bricklayer.  
J. B. Mann, Stanningley, joiner.  
J. E. Bedford, Chapel Allerton, plumber.  
Tennant & Co., Leeds, ironfounder.  
Robt. Branton, Leeds, plasterer.  
Atkinson & Son, Leeds, slater.  
Wm. Grisdale, Leeds, painter.

**LONDON.**

For Construction of Brick Sewer (6,000 feet) from Lee Bridge  
to Lee Green, Kent.

J. Mowlem & Co.	£34,000	o	o
Webster	28,433	o	o
Ossenton	24,949	o	o
Marshall	24,900	o	o
Bloomfield	24,000	o	o
Cook & Co.	23,885	o	o
Bell	21,950	o	o
Botterill & Co.	21,867	o	o
G. C. Trehearne	21,638	o	o
Neave	21,615	o	o
Kellett	21,498	o	o
Bentley	21,300	o	o
Killingback	19,650	o	o
T. Adams	19,490	o	o

For Paving Carriageway of Westminster Bridge with Wood.

R. Mayo	£6,150	o	o
J. Mowlem & Co.	5,980	o	o
J. Biggs	5,000	o	o
G. G. Ratty	4,990	o	o
W. Stubbs	4,400	o	o
Improved Wood Pavement Co.	4,310	o	o
G. C. Trehearne	3,980	o	o

For Erection of New Married Couples' Quarters and Covered  
Ways, at the Fulham Road Workhouse, for the Guardians  
of the Poor of the St. George's Union. Mr. H. SAXON  
SNELL, F.R.I.B.A., Architect, London.

W. Oldrey & Co.	£1,750	o	o
Ward, Clarke & Co.	1,596	o	o
James Holloway	1,550	o	o
T. & H. F. Higgs	1,520	o	o
J. Allen & Sons	1,513	o	o
Wall Bros.	1,497	o	o
Multon & Wallis	1,464	o	o
A. R. Flew & Co.	1,295	o	o

For Pulling Down and Rebuilding Nos. 370 and 372 Holloway  
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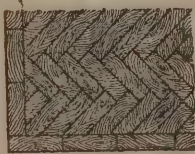
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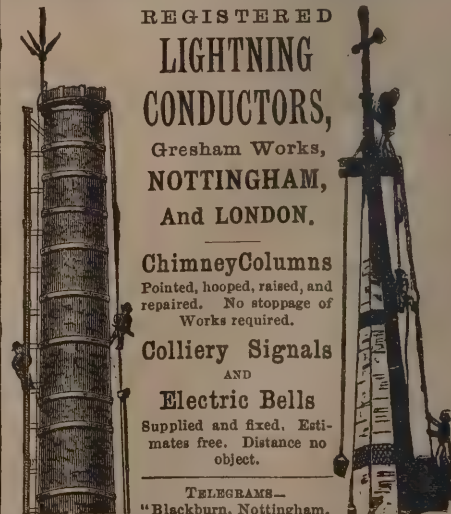
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LONDON—continued.

For Restoration after fire of 25 Commercial Street, White-chapel, E., for Messrs. Koenigsberg & Sons. Messrs. C. STANGER & SONS, Architects and Surveyors, 21 Finsbury Pavement, E.C.

Colls & Sons	£1,410	0	0
Adamson & Son	1,383	0	0
Perry & Co.	1,315	0	0
Scharien	1,283	0	0
O. Craske	1,239	0	0
J. A. Taylor	1,109	0	0
W. Gladding	1,084	0	0
Green & Lee	1,074	0	0

For Making-up Leicester Road, East Finchley, for the Local Board. Mr. G. W. BRUMELL, Surveyor.

G. R. Rackham & Co., Colchester	£1,307	0	0
T. Adams, Kingsland	1,146	7	10
Nowell & Robson, Kensington	1,131	0	0
W. Nicholls, Wood Green	1,111	0	0
G. Bell, Tottenham	1,059	0	0
R. BALLARD, Child's Hill (accepted)	987	0	0

For Supply of Coping Stones and Window Heads and Sills, and the laying, *in situ*, of artificial stone floors at New Leather Warehouses, Abbey Street, Bermondsey, S.E., for Mr. W. Wilkins.  
PATENT INDURATED STONE COMPANY, Westminster Chambers (accepted).

For Alterations to the Hand and Flower, Hammersmith Road, Kensington, W., for Mr. E. Tappenden. Mr. H. I. NEWTON, Architect, 17 Queen Anne's Gate, Westminster, S.W.  
WM. LANGRIDGE, Paddington (accepted).

For Alterations, &c., to the Old Bell, Wellington Street, Strand, W.C., for Mr. J. Rhodes. Mr. H. I. NEWTON, Architect, 17 Queen Anne's Gate, Westminster, S.W.  
R. LOVE & Co., Strand (accepted).

For Alterations, Repairs and Drainage Work at 20 Bishop's Road, W. Mr. EDGAR H. SELBY, A.R.I.B.A., 26 Craven Street, Strand, W.C., Architect and Surveyor.  
R. EDDIE, Upper Street, N. (accepted).

LONDON—continued.

For Internal and External Repairs to Board's Offices, Old Charlton Village, for the Plumstead Board of Works.

		Alternative Tender.
Fuller, Lee	£236 0 0	£270 0 0
Ware, Greenwich	235 0 0	254 0 0
Bridel, Greenwich	219 0 0	229 0 0
Clark, Woolwich	217 0 0	247 0 0
Phippen, Lee	215 0 0	250 0 0
Pollard, Greenwich	200 0 0	235 0 0
Grant, Charlton	195 0 0	230 0 0
Hubbell, Peckham	184 0 0	—
Williams, Charlton	169 0 0	208 0 0
Johnson, Woolwich	166 0 0	187 0 0
Gerrano, Lee	161 15 0	205 15 0
Stephens, Charlton	*160 0 0	180 0 0
Surveyor's estimate	195 10 0	—

\* Recommended for acceptance.

For Making-up Private Roads, Hornsey. Mr. T. DE COURCY MEADE, Engineer.

Shepherd's Hill.

Aspinall & Son, Finsbury Park	£3,900	0	0
Dunmore, Crouch End	3,700	0	0
MOWLEM & Co., Westminster (accepted)	3,349	0	0

Wolseley Road.

Aspinall & Son, Finsbury Park	2,249	0	0
Dunmore, Crouch End	2,241	0	0
MOWLEM & Co., Westminster (accepted)	2,133	0	0

Burgoyne Road.

Dunmore, Crouch End	298	0	0
Mowlem & Co., Westminster	297	0	0
ASPINALL & SON, Finsbury Park (accepted)	234	0	0

Ferne Park Road.

Aspinall & Son, Finsbury Park	3,815	0	0
Dunmore, Crouch End	3,799	0	0
MOWLEM & Co., Westminster (accepted)	3,583	0	0

Elder Avenue.

Aspinall & Son, Finsbury Park	1,180	0	0
Mowlem & Co., Westminster	1,112	0	0
DUNMORE, Crouch End (accepted)	950	0	0

Weston Park.

Aspinall & Son, Finsbury Park	959	0	0
Dunmore, Crouch End	893	0	0
MOWLEM & Co., Westminster (accepted)	834	0	0



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For Improvement Works, Broughton Road, Fulham. Mr. J. P. NORRINGTON, Surveyor to the Vestry.			
Mears, South Kensington	£1,250	0	0
Tomes & Wimpey, Hammersmith	1,238	0	0
Nowell & Robson, Kensington	1,235	0	0
COAT, Hammersmith (accepted)	1,215	0	0

For Improvement Works, Catford.

Brownhill Road.			
Woodham & Fry, Greenwich	£1,049	0	0
Plassey Road.			
Woodham & Fry	493	0	0
Tredown Road.			
R. Mayo, Brixton	609	0	0

## LYDD (KENT).

For Building Residence, Lydd, Kent, for Mr. E. Finn. Messrs. HALL &amp; JENNINGS, Architects, 4 St. Margaret's Street, Canterbury.

Taylor Bros., Hastings	£1,050	0	0
Baker, Ashford	975	0	0
Nun, Tenterden	949	0	0
Adcock, Dover	914	0	0
Deane & Son, Deal	914	0	0
Wallace & Sons, Maidstone	887	0	0
Retts & Sons, Folkestone	887	0	0
Harzill, Lydd	865	0	0
Hayward & Paramor, Shorncliffe	843	0	0
Woodley, New Romney	821	0	0
TERRY & SONS, Canterbury (accepted)	699	0	0
Ironmongery, stoves, grates, chimneypieces, pumps, bath, gasfittings, not included.			

## NEWBURY.

For Road Improvement Works, Newbury. Mr. B. SARGENT, Borough Surveyor.

H. James, Newbury	£178	0	0
Townshend, Newbury	163	10	2
H. BOTSFORD, Newbury (accepted)	129	0	0
For Draining West Mills and West Fields, Newbury.			
Talbot, Reading	£361	0	0
H. Botsford, Newbury	298	0	0
E. James, Newbury	268	0	0
R. MALABAR, Port Erin (accepted)	200	0	0

## MANSFIELD.

For Providing and Laying Water Mains in the parish of Skegby, and Hydrants, Sluices, &amp;c, and Connecting Mains to those of the Sutton-in-Ashfield Water Works, for the Mansfield Union Rural Sanitary Authority. Mr. G. HODSON, Engineer, Loughborough.

A. Knighton, Mansfield	£3,020	0	0
Oakes & Co, Alfreton	2,180	0	0
J. Unsworth, Manchester	2,041	2	8
J. Bush & Co., Preston	1,954	0	0
Marriott & Marshall, Alfreton	1,941	17	2
D. Barry, Ratcliffe	1,888	0	0
J. Lane, Skegby	1,842	18	0
J. F. Price, Nottingham	1,771	0	0
H. Vickers, Nottingham	1,715	0	0
S. Foster, Ratcliffe	1,700	0	0
Pickthall & Sons, Merthyr	1,690	3	6
H. Burrows, Barnsley	1,688	6	6
J. Dickson, St. Albans	1,682	0	0
J. TOMLINSON, Derby (accepted)	1,674	18	4
C. Green, Rotherham	1,648	11	0

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For House, Roadway, and Boundary Walls, Dye House, Fold Road, Oakenshaw, near Bradford, Yorks. Mr. T. L. PATCHETT, Architect, Halifax.

Benjamin Roberts, Oakenshaw.

## POOLE.

For Execution of Works at Poole Park and Recreation Grounds.

Section 13a.			
T. C. Rigler	£2,750	0	0

Section 13b.			
Rigler	2,330	0	0
For Repairs to Fish Shambles, Poole.			
W. H. C. Curtis	£30	5	0
J. F. Jeans, Bournemouth	25	16	6
R. T. Habgood	16	10	0
R. Smith	13	5	0
W. H. Davis	12	0	0
W. H. GRAY (accepted)	10	10	0

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Quantities by Mr. Chas. Taylor, A.R.I.B.A., Cardiff.

T. Rees, Merthyr Vale	£13,999	0	0
C. Jenkins & Sons, Porth	12,800	0	0
D. Davies, Crwys	11,600	0	0
W. Seaton, Pontypridd	11,371	5	0
Jenkins Bros., Swansea	10,906	0	0
J. Allen, Cardiff	10,633	0	0
M. Julien, Pontypridd	10,444	0	0
W. P. Lewis & Co., Hereford	10,250	0	0
E. Turner & Sons, Cardiff	10,245	0	0
W. Bowers & Son, Hereford	10,100	0	0
G. Griffiths, Pontypridd	10,010	0	0
W. Simmons, Cardiff	9,999	0	0
C. Burton, Cardiff	9,975	0	0
W. Thomas & Co., Cardiff	9,794	0	0
Exors. of W. Gradwell, Newport	9,650	0	0
W. Williams, Pontypridd	9,210	0	0

## ROWLAND'S CASTLE.

For Building Cottage for Mr. J. P. Bastin, Rowland's Castle.  
Mr. A. E. J. GUY, Architect.

J. Crockerell, Portsmouth	£335	0	0
Cousins, West Marden	268	0	0
Turner & Winslade, Chichester	263	0	0
J. Edwards, Waterlooville	247	0	0
T. P. HALL, Portsmouth (accepted)	240	0	0

## SLOUGH.

For Building the Leopold Institute and Public Hall, near Slough Station. Mr. H. A. CHEERS, Architect, Twickenham.

Watson, Ascot	£5,595	0	0
Crowhurst, Slough	5,573	0	0
Symonds, Reading	5,475	0	0
Grist, Aylesbury	5,418	0	0
Smith & Sons, London	5,335	0	0
Henley & Co., London	5,252	0	0
Bradney & Co., Wolverhampton	5,182	0	0
Green, Aylesbury	5,112	0	0
Shillitoe, Bury St. Edmunds	4,995	0	0
Page, Banbury	4,995	0	0
Imwood, Malvern	4,975	0	0
Hickinbotham, Teddington	4,765	0	0
T. MARTIN, Maidenhead (accepted)	4,655	0	0

## SOUTHAMPTON.

For Alterations and Reseating Above Bar Chapel, High Street, Southampton. Mr. W. H. MITCHELL, Architect, Southampton.

Dyer & Sons	£5,370	0	0
W. H. Bull	5,249	0	0
Chapman	4,980	0	0
Morgan, Isted & Morgan	4,686	0	0
Stevens & Sons	4,440	0	0
Crook & Sons	4,437	0	0
Witt	4,333	0	0
Franklin	3,980	0	0
KINGERLEE* (accepted)	3,845	0	0

\* Of Oxford, all the remainder of Southampton.

## SUTTON-IN-ASHFIELD.

For Laying Mains, Fixing 8-inch Water Meters and Auxiliary Steam Pumps to raise Water to Water Tower, Annesley Woodhouse, and the Reservoir at Hucknall Huthwaite, for the Sutton-in-Ashfield Local Board. Mr. GEORGE HODSON, Engineer, Loughborough.

D. Barry, Ratcliffe	£1,255	0	0
C. Green, Rotherham	1,179	0	0
L. Foster, Ratcliffe	1,140	0	0
J. Dickson, St. Albans	1,118	0	0
J. Bush & Son, Preston	1,118	0	0
J. F. Price, Nottingham	1,112	0	0
H. Burrows, Barnsley	1,108	9	5
H. Vickers, Nottingham	1,085	0	0
Holme & King, Liverpool	1,056	0	0
J. TOMLINSON, Derby (accepted)	1,012	13	0

## WARRINGTON.

For Cast-iron Water-tank, Warrington Workhouse.

W. Jones & Son	£123	10	0
Pearson & Knowles	120	0	0
WIDNES FOUNDRY CO. (accepted)	104	0	0

## TRADE NOTES.

CHRISTMAS HOLIDAYS.—Messrs. Oetzmann & Co., and other large firms, have announced their intention of remaining closed from Saturday afternoon, December 22, to the following Thursday morning.

RATBY CHURCH, near Leicester, has just been reopened

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after considerable alterations and improvements in the interior. Amongst others may be mentioned a handsome brass eagle lectern, which, with chancel standards and other articles, has been presented by a wealthy parishioner. The work was entrusted to Messrs. Jones & Willis, of Birmingham and London.

MESSRS. J. & C. CHRISTIE, of Mansell Street, have executed the plumbing and sanitary work, the fire-mains, and the gallery guard-rails in the new Lyric Theatre.

MESSRS. PITMAN & SON, of Newgate Street, have just completed a large oval-shaped stained-glass window for the chapel of the Poor-house of the City of London Guardians, Homerton. The inscription, "O worship the Lord in the beauty of holiness," is prominent around the outer edge; in the centre is the sacred monogram, with foliage, fruit, &c. It forms an appropriate addition to the important window, "The Good Shepherd," which Messrs. Pitman & Son were commissioned to provide last year, for the same building, in commemoration of Her Majesty's Jubilee.

THE Insanitary Property and Artisans' Dwellings Committee of the Liverpool Town Council have recommended that the Council place at their disposal the sum of 7,600*l.* for the erection of labourers' dwellings, and the sum of 14,000*l.* for the purchase of insanitary property.

THE extension of the works of the Leeds Steel Forge Company, Limited, a new company until recently carried on by the Airedale Steel and Hematite Iron Company, Hunslet, Leeds, is being pushed forward. It is anticipated that by the first week in January the managers of the new enterprise will be able to commence turning out best steel by the basic process. For the purpose of the extension a considerable quantity of land adjoining the old works has been acquired.

GROUND at Clydebank has been staked off by the contractors, Messrs. Hunter & Kerr, Glasgow, for three blocks of dwelling-houses and shops on the south side of the Glasgow Road, opposite Hamilton Place. The tenements are to be three storeys in height, and are the first instalment of twelve or thirteen blocks that are to be built there, and which will give accommodation to eighty or ninety families. The new block of buildings being erected at the foot of Kilbowie Road is nearing completion.

At a meeting of property owners of Northwich held on Tuesday, it was resolved to present a memorial to Parliament asking for the appointment of a Royal Commission to inquire into the injuries inflicted upon property, roads, sewers, gas and

water-pipes of the district by the subsidence resulting from brine-pumping, and to ask for compensation for damage done. Northwich is in a terribly dilapidated state, and the sinking of the public streets threatens to bring the town below the level of the river.

A BILL is to be promoted in Parliament for additional powers for the Bridlington Local Board with reference to the Sea Wall Parade, and the transfer of the existing rights of the lord feoffees of the manor.

A LANDSLIP has befallen the Queen's Parade at Scarborough immediately above the undercliff which the Corporation are transforming into pleasure grounds on the North Cliff. It is feared that the accident will necessitate extra expenditure of money.

A STAINED-GLASS window, in memory of the late Archbishop Strain has been unveiled in the Roman Catholic Chapel, South Queensferry, Edinburgh. The work has been executed by Messrs. Barnett & Son, of Leith.

A MONSTER blast by mining has been effected at Furnace Granite Quarry, Lochfyne Side, of which Messrs. Sim & Co., granite merchants, Glasgow, are the lessees. The mine was bored through the solid rock at a height of 45 feet above the quarry floor. From the mouth or entrance it ran in an easterly direction 59 feet, and at this point sank straight downwards to a depth of 12 feet, and from thence it ran in a north-westerly direction 36 feet, when it reached a chamber in which there were deposited 10,525 pounds, or nearly five tons, of gunpowder. The chamber measured 7 feet in length, 5 feet in breadth, and 5 feet in height. The whole length of the bould rock measured 114 feet, and the rock resting immediately above the chamber was 150 feet. The blast was successfully exploded by means of an electric battery, when about 75,000 tons of granite of fairly good quality were displaced.

THE tender of Mr. Joyce, of Whitchurch, has been accepted for the erection of a new clock in St. John's Church, Coventry. There was a large number of tenders, and those of Mr. Potts, Leeds, and Mr. Gillett, Croydon, ran very close to the accepted tender.

COMPLAINTS have been made as to the nuisance created by the intercepting depôts at Howley and Battersby Lane district, Warrington. The Sanitary Committee and Mr. Longdin, borough surveyor, have just been conducting experiments at the Howley depôt with the object of mitigating, if not entirely abating, the evil. It is claimed that the experiments have been attended with success. The operation consists in the foul air

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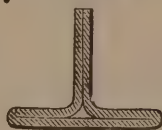
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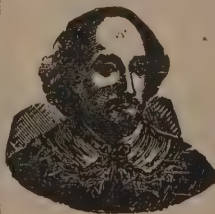


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being drawn by means of a fan through a series of pipes into a large tank containing disinfectants. The air having been purified passes out of the tank, the only smell being that of carbolic.

THE Government surveyor from Edinburgh has been inspecting various sites at Paisley for the erection of a new general post-office. The present post-office was built about ten years ago at a cost of 8,000*l.*, but is now insufficient to meet the needs of the town.

CONTRACTS for a second series of private street improvements at Horwich have been signed by Mr. Cowburn, of Hindley, and Mr. Unsworth, of Earlstown. Upwards of twenty streets will be dealt with under the two contracts, the cost being about 2,300*l.* The first series of street improvements were let to Mr. W. Pollitt, of Bolton.

MESSRS. MANLOVE, ALLIOTT & CO. notify a change in their London address after Christmas from 50 Queen Victoria Street, E.C., to 276 Winchester House, Old Broad Street, E.C.

MESSRS. JOHNSON BROS., of Birmingham and 21 Warwick Square, Paternoster Row, E.C., have brought out a new series of "Planet" pens and "Acme" pens of excellent quality, which for the convenience of purchasers can be had in sixpenny or shilling boxes as well as in gross boxes. The way in which the boxes and labels are got up is creditable, and in keeping with the good quality of the pens contained in them.

THE annual meeting of the Dundee and District Plumbers' National Registration was held in the Guild Hall, Dundee, on Saturday. The secretary, Mr. Farquharson, reported that examinations in practical work prior to registration had been held in various towns, and of 57 candidates 47 satisfied the examiners of their practical efficiency. The Company of Plumbers had presented certificates to 38 masters and 105 operatives in the district.

#### NOTES ON NOVELTIES.

Messrs. Corfield & Morgan, of Cardiff, have recently introduced a novelty to the London market, which ought to find favour amongst a large section of our readers. It consists of a combination of marble mantel and overmantel and mirror, giving a uniformity of effect which is both fresh and artistic. In the ordinary way a mantelpiece was surmounted by a wood

overmantel, with mirror, but we think it does not give a perfect relief to the furniture, as this complete combination of Messrs. Corfield & Morgan's, in which is seen harmony of colour and brightness. Again, there is much more scope for design in the latter in the way of pretty pillars, brackets, and projections, which seems to have been realised by the firm in many of their excellent specimens. This innovation might suggest to architects designs for the manufacturers to copy. Messrs. Corfield & Morgan apply the same principle in slate mantels and overmantels in imitation of griote, malachite, Sienna, serpentine, and other marbles, to such purpose that they can be scarcely distinguished. The quality of the work is especially noticeable in its high finish and variety of design, in which connection we should add that Messrs. Corfield & Morgan import their marble direct, and use their slate direct from the quarry, and in both instances they are chiselled and modelled by the most skilled men, and worked from raw slabs into the artistic specimens of mantels and overmantels. The material used is solid, thick, and durable, as distinguished from much of the cheap imported work. We understand that specimens of Messrs. Corfield & Morgan's combination mantel and overmantel can be inspected in London at Adams's emporium, 67 Newington Causeway, S.E.

#### THE REVALUATION OF THE METROPOLIS.

THE totals of the gross and rateable values of the parishes and unions of the metropolis, to come into force on April 6 next, have just been compiled by Mr. Jebb, the officer appointed under the Act of 1869 (Valuation of the Metropolis), and show an increase of gross value from 37,704,434*l.* last April to 38,028,506*l.*, and of rateable value from 30,975,672*l.* last April to 31,244,495*l.* The increase is not constant over the metropolis, but values have, as a rule, been fairly maintained, and the places which will be assessed at less value are undergoing changes which, for the most part, will lead to higher assessments in times to come.

The highest assessment of any place, parish, or union is the Union of the City of London, and the 112 parishes, precincts, and inns, from the boundaries of Westminster, at the Griffin, Fleet Street, to Aldgate, and from the Thames to St. Giles, Cripplegate, within the City give a total of 4,598,907*l.* gross value as the next assessment, as against 4,556,252*l.* of the present assessment, and a rateable value from next April of

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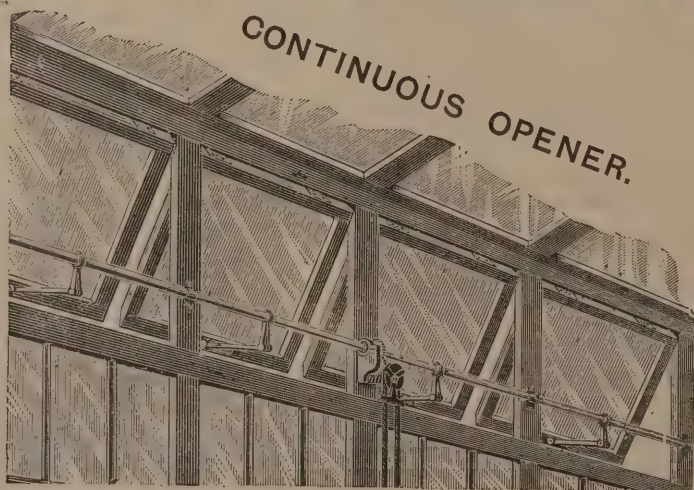
3,822,571 $\frac{1}{2}$ , as against the present assessment value of 3,792,020 $\frac{1}{2}$ . The Middle Temple and Inner Temple, though forming no part of the City of London Union, are assessed by the committee of the Union, and these places show, in one instance—that of the first-named—an unchanged assessment of 18,608 $\frac{1}{2}$  gross and 15,491 $\frac{1}{2}$  rateable, the same as last year; and the latter is 27,122 $\frac{1}{2}$  gross and 22,697 $\frac{1}{2}$  rateable, as against 27,146 $\frac{1}{2}$  gross and 22,717 $\frac{1}{2}$  rateable of the present year. The other places of the metropolis are taken in alphabetical order, and the comparison of the current year values will show the increase or decrease. Bethnal Green parish will have next year a total rateable value of 403,378 $\frac{1}{2}$ , as against 401,609 $\frac{1}{2}$  this year. The parish of St. Giles's, Camberwell, will have a total rateable value of 1,028,652 $\frac{1}{2}$ , as against 1,016,544 $\frac{1}{2}$ . St. Luke's, Chelsea, will have a rateable value of 629,804 $\frac{1}{2}$ , as against 625,309 $\frac{1}{2}$ . St. John's, Hampstead, will have a rateable value of 620,240 $\frac{1}{2}$ , as against 595,476 $\frac{1}{2}$ . St. Mary's, Islington, will have a rateable value of 1,639,621 $\frac{1}{2}$ , as against 1,631,843 $\frac{1}{2}$ . St. Mary Abbott's, Kensington (gross value 2,269,253 $\frac{1}{2}$ ), will have a rateable value of 1,902,163 $\frac{1}{2}$ —the largest assessment of any one parish—as against 1,876,043 $\frac{1}{2}$  of this year. St. Mary, Lambeth, will have a rateable value of 1,490,965 $\frac{1}{2}$ , showing a decrease from 1,491,123 $\frac{1}{2}$ . The hamlet of Mile End Old Town will have a rateable value of 367,573 $\frac{1}{2}$ , a decrease from 367,793 $\frac{1}{2}$ . St. Mary, Paddington, will have a rateable value (decreased) of 1,274,807 $\frac{1}{2}$ , as against the present rateable value of 1,276,607 $\frac{1}{2}$ . St. Leonard's, Shoreditch, will have a rateable value of 644,246 $\frac{1}{2}$ , as against the present value of 642,133 $\frac{1}{2}$ . St. Marylebone will have a rateable value of 1,433,617 $\frac{1}{2}$ , against the present assessment value of 1,433,029 $\frac{1}{2}$ . St. Pancras will have a rateable value of 1,559,744 $\frac{1}{2}$ , a slight decrease from 1,560,633 $\frac{1}{2}$  of the present year. St. George's-in-the-East will have a rateable value of 188,638 $\frac{1}{2}$ , as against 185,292 $\frac{1}{2}$ . The Union of St. Giles's-in-the-Fields (gross 208,818 $\frac{1}{2}$ ) and St. George's, Bloomsbury (gross 174,176 $\frac{1}{2}$ ), will have a combined rateable value of 382,944 $\frac{1}{2}$ , as against 380,763 $\frac{1}{2}$ . Lincoln's Inn is separately assessed at 21,149 $\frac{1}{2}$ , as against 19,608 $\frac{1}{2}$ . St. George's Union (St. George's, Hanover Square, St. Margaret's and St. John's, Westminster, and the Close of the Collegiate Church of St. Peter, Westminster) will have a rateable value of 2,444,026 $\frac{1}{2}$  (gross 2,932,688 $\frac{1}{2}$ ) as against the present rateable value of 2,433,200 $\frac{1}{2}$ . The Fulham Union (Fulham and Hammersmith) will have a rateable value of 881,335 $\frac{1}{2}$ , as against 863,485 $\frac{1}{2}$ . Greenwich Union (including both the parts of St. Paul's, Deptford, in Kent and Surrey, and St. Nicholas, Dept-

ford) will have a rateable value of 762,340 $\frac{1}{2}$ , as against the present rateable value of 743,754 $\frac{1}{2}$ . The Hackney Union (Hackney and Stoke Newington) will have a rateable value of 1,131,880 $\frac{1}{2}$ , as against 1,121,693 $\frac{1}{2}$ . The Holborn Union (including the parishes of St. Andrew-above-Bars, St. George the Martyr, Furnival's Inn, the part of St. Sepulchre in Middlesex, Saffron Hill, Hatton Garden, Ely Rents, Staple Inn, the parishes of St. James and St. John, Clerkenwell, St. Luke, Middlesex, and the Charterhouse) will have a rateable value of 1,032,699 $\frac{1}{2}$ , as against 1,016,285 $\frac{1}{2}$ . Gray's Inn will have an unchanged rateable value of 16,067 $\frac{1}{2}$ . The Lewisham Union (Lee, Eltham, and Lewisham) will have a rateable value of 657,062 $\frac{1}{2}$ , as against 652,579 $\frac{1}{2}$ . The Poplar Union (St. Mary, Stratford, All Saints, Poplar, and St. Leonard, Bromley) will have a rateable value of 665,025 $\frac{1}{2}$ , showing a decrease from the present value, 673,397 $\frac{1}{2}$ . St. Olave's Union (St. Thomas, Southwark, St. Mary Magdalen, Bermondsey, St. Olave, Southwark, St. John, Horselydown, and St. Mary, Rotherhithe) will have a rateable value of 790,377 $\frac{1}{2}$ , a decrease from the present 805,096 $\frac{1}{2}$ . St. Saviour's (Southwark) Union (Christ Church) St. George the Martyr, St. Saviour's, and St. Mary, Newington, will have a rateable value of 1,044,087 $\frac{1}{2}$ , as against 1,041,942 $\frac{1}{2}$ . The Stepney Union (St. Paul's, Shadwell, the Hamlet of Ratcliffe, St. Ann's, Limehouse, and St. John's, Wapping) will have a decreased rateable value of 303,315 $\frac{1}{2}$ , as against 303,746 $\frac{1}{2}$ . The Strand Union (St. Martin's-in-the-Fields, St. Paul's, Covent Garden, the Precinct of the Savoy, St. Mary-le-Strand, St. Clements Danes, and the Liberty of the Rolls) will have a rateable value of 859,636 $\frac{1}{2}$ , as against the present rateable value of 834,656 $\frac{1}{2}$ . The Wandsworth and Clapham Union (including Clapham, Tooting Graveney, Streatham, St. Mary's, Battersea, Wandsworth, and Putney) will have a rateable value of 1,645,539 $\frac{1}{2}$ , as against 1,598,197 $\frac{1}{2}$ . The Westminster Union (St. Anne's and St. James's) will have a rateable value of 825,213 $\frac{1}{2}$ , as against 819,703 $\frac{1}{2}$ . The Whitechapel Union (including the Precinct of the Old Tower Without, the Holy Trinity, Minorities, Liberty of the Old Artillery Ground, the Hamlet of Mile End New Town, St. Mary's, Whitechapel, Liberty of Norton Folgate, St. Botolph Without, Aldgate, the Precinct of St. Katharine, and Christ Church) will have a rateable value of 385,831 $\frac{1}{2}$ , as against the present rateable value of 379,992 $\frac{1}{2}$ . The Woolwich Union (Charlton, Kidbrooke, Woolwich, and Plumstead), will have a rateable value of 346,712 $\frac{1}{2}$ , as against 339,818 $\frac{1}{2}$ , the present rateable value.

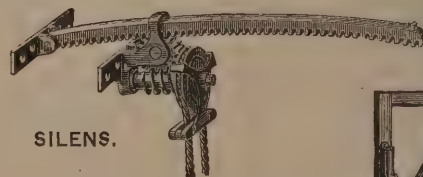
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SILENS.

THE SILENS, for Fanlights, Skylights, &c. is admitted to be the best ever put before the Public. Can be adapted to any kind of window. Size and height of window no object.

From 4/3 each.

The WILMOS is worked with a rod or endless cord. It is extremely neat, and can be fixed to open either top or bottom, inwards or outwards; no cutting away of frame required. When worked with a rod is most efficient for Public Buildings, as the key can be loose. For Price Lists Illustrations, and Testimonials, write as below.

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SIRS,—I have pleasure in testifying that I have used Leggott's Silens Adjustments for various buildings to high skylights, fanlights, and top parts of windows, and in every case they gave satisfaction.

They are secure in whatever position, whether the window is open or closed, and are quite simple and workable in their action. I prefer them to any other that I have seen or used for the above-mentioned purposes.

Messrs. W. & R. LEGGOTT, Bradford.

I remain, yours obediently,

R. DAVIES Architect.

BANGOR: N. Wales: Sept. 14, 1885.

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TELEGRAPHIC ADDRESSES—"SILENS BRADFORD"



The totals of 38,028,506*l.* gross value of the metropolis from April 6 next, and 31,244,495*l.* rateable, may be contrasted with the like figures in the first year of the present decennial period, 1881, when the totals were—gross, 33,204,519*l.*, and rateable, 27,402,509*l.* In the first year of the previous decennial period, 1871, the figures were—gross, 24,176,338*l.*, and rateable, 19,900,072*l.* The metropolis thus is shown to have increased from less than 20,000,000*l.* in rateable value to more than 31,000,000*l.* in the eighteen years, and by more than 14,000,000*l.* in gross value in the same period.

#### ELECTRIC LIGHTING IN THE INNER TEMPLE.

A PETITION to the treasurer and benchers of the Inner Temple is being extensively signed by the members of that Inn against the extensive works at present in progress, in the Inner Temple Gardens, in connection with the installation of the electric light in the Inner Temple. The petitioners point out, among other things, that the erection of the engines, dynamos, and works in the Inner Temple Gardens will not only seriously depreciate the value of the chambers in the vicinity, but will constitute a permanent eyesore and disfigurement to the gardens. The petitioners, therefore, pray that if the extension of the electric light in the Inner Temple cannot be carried out except at such a sacrifice, the scheme be forthwith abandoned.

#### LIVERPOOL THEATRES.

At a meeting of the justices of the peace for the city of Liverpool, which was held on Monday, Sir James Picton, who was chairman, explained the action that the bench had taken for the purpose of having precautions provided in the local theatres for the safety of the public. The sub-committee appointed by the magistrates, after visiting the theatres, recommended that certain rules and regulations should be observed by the lessees and others in charge of such buildings, and the licenses were only renewed when those rules and regulations had been to a large extent complied with. The bench recommended the watch committee to appoint an inspector to visit the theatres so as to ensure the carrying out of those rules and regulations, more especially with regard to fireproof curtains and iron doors between the stage and auditorium.

It was reported that the head-constable did not consider that police-inspectors possessed the qualifications for the duties which would be imposed on them by the magistrates, and that the duties would be more than would fill up the whole time of a duly qualified man.

The Chairman remarked that the matter was of such importance that, although it would only be temporarily in their hands, precautions ought to be taken so that perfect arrangements might be handed over to their successors. He had sketched out a resolution, which he would move, viz.:—"At a meeting of the city justices, held on December 17, 1888, the correspondence between the law clerk and the head-constable on behalf of the watch committee having been read, it was resolved that, in the opinion of this bench, it was essential for the safety of the audiences attending the theatres that the precautions and regulations prescribed by the magistrates should be carried out under police inspection; and the attention of the watch committee to the subject is earnestly requested."

Mr. Meade-King thought the justices should in some way or other define what were the rules and regulations which the police-inspector was to observe. It seemed to him that the controversy which the correspondence disclosed arose out of a misconception of what these rules and regulations were. The head-constable stated that no ordinary policeman could possibly superintend the duties expected of him, and he (Mr. Meade-King) contended that the task would be of the simplest possible character.

The Chairman said that, if the watch committee repudiated all responsibility, the magistrates had no power to incur expense. The whole thing would then fall to the ground.

Mr. Patterson: Who will have the power of making the rules after April 1 next?

The Chairman: I presume the county council will.

Mr. Patterson considered that the power was in the hands of the police to see that the rules were carried out, and he saw no reason why the letter addressed by Mr. Ellis to the head-constable, together with Sir James Picton's resolution, should not be sent to the watch committee and await the result. The watch committee would have the whole matter in their charge from April 1 next, and they might as well look a little ahead. He regretted that action had not been taken before. There was one theatre underneath which were a stable and warehouse, separated from the auditorium only by the floor, in which a quantity of hay and straw and some ponies were kept.

The Chairman: To what theatre do you allude?

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Mr. Patterson: The one in Paradise Street, if I remember right.

The Chairman: There was a wall carried down there. What may be under the floor of the theatre I don't know.

Mr. Patterson supposed there was some guarantee given to the committee that the ponies would be taken away, but somebody ought to see that the place was not used in a way eminently dangerous. That was the reason he believed the police could look better after the matter than any one else.

Mr. Billson seconded the resolution.

Mr. Behrend drew attention to the near approach of the pantomime season, and said something ought to be done in the matter quickly, owing to the large crowds that always visited the theatres at such a time.

The motion was afterwards carried unanimously.

### THE QUEEN ANNE MANSIONS.

ON Friday, counsel for Mr. James Knowles, architect, who resides in a house known as Queen Anne's Lodge, St. James's Park, moved for an order to commit Messrs. Lucas & Aird, contractors, for contempt of Court. The case arose in connection with the action Knowles *v.* Queen Anne and Garden Mansions Company, Limited, the defendants being the owners of the fee simple of Queen Anne's Lodge. The company were engaged in carrying out a scheme to extend the existing Queen Anne's Mansions by pulling down Garden Mansions and erecting new buildings of a great height. The plaintiff complained that these operations were calculated to cause, and in fact had already caused, considerable damage to his house, by depriving it of the support which it had hitherto enjoyed, and also by reason of the interference with the access of light. He, therefore, moved for an injunction to restrain the defendants, their contractors, agents, and servants, from pulling down or weakening or interfering with the wall separating his house from the defendants' premises or in any way depriving such wall of its present support, or making any openings in the wall or otherwise causing damage to Queen Anne's Lodge, and from erecting or continuing to erect any buildings so as to obstruct or interfere with the access of light to Queen Anne's Lodge. The case has been before the Court on several occasions, but from time to time, on the application of the parties, it has stood over. On November 26, Messrs. Lucas & Aird gave an under-

taking, following upon one previously given by the company, not to pull down or weaken or interfere with the wall in question, nor in any way deprive such wall of its then present support, nor make any opening in the wall or otherwise cause damage to Queen Anne's Lodge by their building operations. Since that date the plaintiff alleged that the contractors had, notwithstanding their undertaking, continued to carry on the building operations by excavating the soil adjacent to the plaintiff's wall, and had so brought about a settlement of the wall and caused serious cracks to appear therein. The plaintiff then moved for an order for commitment. The evidence, which consisted to a great extent of affidavits by surveyors and architects, was very conflicting; that on behalf of the defendants being to the effect that the building operations had been carried out with the utmost care, having regard to the safety of the plaintiff's house, and in fact that its stability had not been in any way injured; that the cracks in the wall were not of recent origin, the house being a very old one, but had probably been caused by the vibration of the trains upon the District Railway, which runs in close proximity to the plaintiff's house, or by some cause other than the building operations. The defendants also alleged that the plaintiff had refused to allow his wall to be underpinned, and therefore they had been obliged to construct the foundations of their buildings in short sections, excavating the soil and filling up the holes thus made with concrete and brickwork as they went along. It appeared that, after the undertaking given by the contractors, they had, acting under the advice of an engineer whom they had consulted, continued the making of the holes and filling them up as described, their opinion being that by so doing they were not breaking the undertaking not to deprive the wall of its support. At the commencement of the case the defendants' counsel gave an undertaking as to the interference with the plaintiff's right to light, which was accepted by his counsel. The defendants also, at the suggestion of the learned Judge, agreed to give an undertaking not to make more than one hole at a time, each hole to be of a stipulated size and to be filled up as soon as excavated in the manner described.

Mr. Justice Stirling after stating the facts and alluding to the evidence, said that it was so conflicting that he should not have been prepared to decide the case upon it without some further assistance from experts. The question was whether the plaintiff was likely to suffer any serious injury, and if the defendants were restricted by the proposed undertaking it did not seem that any serious damage could accrue

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## NEW IMPROVED "TRADE" DYNAMO.

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**BEST DESIGN, WORKMANSHIP, AND MATERIALS.**

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LAMPS.	WATTS.	AMPS.	VOLTS.	REVS.	CODE WORD.	PRICE.
100	5,000	45	110	1,200	Che.	£60
240	12,000	109	110	1,200	Cheap.	£110
360	18,000	162	110	1,000	Cheaper.	£140
480	24,000	220	110	1,000	Cheapest.	£165

Delivery: Chelmsford.

Foundation Rails and Packing extra.



to the plaintiff's house; while, on the other hand, if he were to grant the injunction asked for, he might seriously hamper the defendants in the operations which they were carrying on upon their own land. Under the circumstances, he thought he ought not to make any order upon the principal motion. There was another point as to the pulling down of a cross wall, which, it was alleged, robbed the plaintiff's wall of its support. As to that, he thought the evidence was not such as to justify his interference. He had still, however, to dispose of the motion to commit the contractors for breach of their undertaking not to deprive the wall of its then present support. His lordship considered the evidence on that point, and referred to the affidavit of the gentleman whose advice the contractors had taken, and who did not go so far as to say that what had been done after the undertaking had had no effect upon the supports of the wall, but only said that it did not deprive the wall of any support which was "in the least degree necessary" to it. That was not enough to clear the contractors. They were an eminent firm, and had filed evidence in explanation of what they had done, and stating that if they had broken the undertaking they had done it in good faith and inadvertently. His lordship was willing to accept their statement. Nevertheless, it must be clearly understood that such undertakings were sacred and to be obeyed to the letter. Under the circumstances, therefore, he must order them to pay the costs of the action.

#### ELECTRICITY AND ARTESIAN WELLS.

THE discharge of water from artesian wells has for many years been employed as a motive power in France. In the city of Tours there is an artesian well which drives a hydraulic wheel seven metres in diameter, and works the machinery of a silk factory. At Grenelle the heat of the water issuing from a deep well is utilised in warming buildings. A project is now before a Commission of the Municipal Council of Paris having for its aim the utilisation of the power obtainable from the new artesian well in the Place Hébert, at La Chapelle. There are now three important artesian wells in the Paris basin; that of Grenelle being the oldest, and that at Passy the most productive. The new La Chapelle well is, however, situated in an industrial quarter of the eighteenth arrondissement, and is thus well adapted for the experiment of producing motive power. Besides these there are a number of private artesian wells in Paris belonging to manufacturers. The La Chapelle well was

finished in March last, having been begun twenty-four years ago. It reaches a depth of 720 mètres, and the water, left to itself, rises to a height of 35 mètres above the mouth. It furnishes 6,000 cubic mètres of water in twenty-hour hours. The proposal is to utilise the power furnished by the well in generating and distributing electricity for lighting and motive purposes. One object mentioned is the lighting of the park of the Buttes Chaumont, which is situated near the well. Before now electricity has been generated in this manner. At Ponce de Leon, in Florida, there is an hotel having a powerful artesian well, which drives a turbine-wheel and dynamo, thus generating the current necessary to light the building and its grounds. At Yankton, in Dakota, there is a flowing well which drives the dynamos of an electric light company. The well is 600 feet deep, and the water on issuing from it is conducted to a reservoir placed 30 feet above the turbine which actuates the dynamos.

#### TECHNICAL EDUCATION.\*

MOST people seem to be agreed that some sort of technical education is necessary, but they are not at all in accord as to what form this education should take. Many of them, I think, consider that the multiplication of science colleges is all that is wanted; these may do well for the higher class of students who have already received a moderately advanced education, but for all the ordinary purposes, for technical education as I have described it, that is to say, as a preparation for the lifework of 99 per cent. of individuals, they are practically useless; even in the case of the remaining 1 per cent. I think they fall short of what is requisite and especially in workshop practice. I do not think that the workshops attached to these establishments are of much value, except when considered as testing rooms; the work done must necessarily be amateurish, for it is not done for commercial purposes; the objects worked at are frequently old-fashioned and out of date, and thus the knowledge gained is of little value. I believe that it would be far preferable that these colleges should be affiliated to large workshops, in which, and in which only, a thorough knowledge, such as is aimed at, can be obtained. The advantages might be made reciprocal, so that, whereas the pupils at the college were

\* From the presidential address delivered before the Civil and Mechanical Engineers' Society by Mr. Middleton.

## IMPORTANT NOTICE.



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**ART-METAL WORKERS,**



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able to visit the works, so also the draughtsmen, foremen and men from the works might visit the college and attend evening lectures there.

I firmly believe that every engineer, whether he intends to follow the civil or mechanical branches of his profession, should spend a reasonable time in the shops of some large works; and if this is true of the engineer, how much more true must it be of the men who have to pass their lives and earn their livelihood in such works? and this brings us to the question of what is the best form of technical education for the men.

Professor Huxley says, and I fully agree with him, that we are not likely to hit off a perfect scheme at once, but that we can only arrive at some approach to perfection through much blundering; he goes on to say that consistent error is very often vastly more useful than muddle-headed truth, and I think we have all had experience of the accuracy of this statement. Let us hope, nevertheless, that the scheme of education, whatever it is, may approach as nearly as may be to consistent truth.

Let me give you a few facts and figures from a pamphlet by Mr. Alfred Harris on "Industrial Art Teaching and the System of Progressive Schools in Germany."

Mr. Harris says that what we want in this country are progressive schools such as are in use in Germany, the district to which he specially refers being Würtemberg. He contends that we have primary schools and science colleges, but no intermediate education, nothing which will enable the boy who leaves the Board school at the age of twelve or thirteen to continue his education voluntarily up to a time when he might be fitted to enter a science college, or to such an extent, at any rate, that when he had reached the age of sixteen or seventeen he would know more, not less, than when he was ten.

In Würtemberg one such school numbers 300 students, the total expenses being 695*l.*, or 2*l.* 6*s.* 4*d.* per student. Of this sum 116*l.* is provided by the students themselves, and the balance of 579*l.* is borne half by the municipality, and half by the central department.

The subjects taught are:—Geometrical and freehand drawing in its more advanced stages. Careful and correct modelling in wax or clay from well-selected models. Sketching from natural objects and casts, figure drawing from models, ornament and still life, and original design, these being the requirements of the industry which flourishes where the school is situated; payment is not made by result, but the teachers have fixed salaries.

The government of the industrial system is of a paternal character. The central department at Stuttgart is composed of a president, with administrative and technical officers who conduct the general business. They are assisted when required by the teachers in various institutions, and by representative counsellors, merchants, manufacturers, &c., chosen every four years by the Chambers of Commerce in the provincial centres.

Although the Central Department of Industry is supported by the State, it acts rather as an intermediate authority between the industries of the country and the Government than as a bureaucratic department. Its officers are in close touch with the trade organisations of the country on the one hand, and with the higher departments of the Government on the other.

The department acts upon the principle that more is to be gained by practical assistance in the development of industry than by *theoretical instruction*.

There are in Würtemberg, which has a population of 2,000,000, about 690 of the evening classes such as have been described, besides 906 schools and classes for agriculture, with an attendance of 21,000, and 82 agricultural reading-rooms with over 3,000 members.

Mr. Harris maintains that many industries which had almost died out have been revived and made into flourishing businesses by the help of these schools.

Mr. Swire Smith, one of the Commissioners on Technical Instruction, says, in his pamphlet on Technical Education and Foreign Competition:—"The systems of education on the Continent vary in details, but in the leading countries the schools rise in well-defined steps from the lowest to the highest, each grade preparing the student for the next above. Drawing is taught universally, and modelling in most of the French and Belgian schools. The elements of science are taught in Germany and Switzerland, and many pupils in elementary schools throughout France and other countries receive workshop instruction. The whole system is harmonious, elastic, and capable of modification at every step. By the teaching of drawing and modelling, elementary science, and manual occupations, the boys and girls are interested in the development of their skill as a means of obtaining a livelihood; their instruction directs them to suitable callings, and a prepared constituency of young men is formed in every town for the technical schools and evening science and art classes which are attended by tens of thousands of students.

"Technical education has taught foreign manufacturers of all kinds how to adapt their goods to the wants of their

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customers, and how to lead or follow the constantly changing fashions. Commercial education has been equally useful to merchants and distributors, enabling them, by a knowledge of foreign languages, to come into direct contact and sympathy with producers on the one hand and distant customers on the other, thereby promoting rapid interchange of ideas for mutual advantage. Distributors have learned from remote customers how to make up their wares so as to suit local weights, measures or fancies, and in a hundred ways to gratify the whims of those for whose business they are catering. These matters may seem to be small and unimportant in themselves, but they are sufficient to turn the balance in all cases of choice, other conditions being equal, and we have seen many cases where the refusal on the part of English manufacturers to alter a pattern or style in order to please a customer, and where, through English ignorance of foreign preferences or tastes in matters of detail, large orders have gone to France or Germany which otherwise would have come to England."

On the other hand, Mr. Swire Smith says that on the return of the commissioners to England, after inspecting the schools abroad, they visited competing establishments, and tested the foreign evidence face to face with all the facts in our own country. They obtained undoubted evidence, proving that, in so far as economy of production is concerned, English manufacturers, despite the higher wages and shorter hours of English compared with those of foreign workmen, have nothing to fear. In respect to machinery, organisation, spirit and energy, they believe the foremost place must be given to English employers and operatives, although in respect of these points the rapid progress of our German rivals during recent years shows unmistakably that there must be neither rest nor sleep if we are to maintain our ground. The best machinery is English; in some of the weaving factories even the yarn is English. The superiority of the foreign establishments is not in machinery, but in men; not in natural faculties, but in training. Nor is this superiority confined to solitary and unimportant industries; it applies not only to machine-work but to hand-work, and to the highest branches of almost every manufactured commodity which enters into the domestic service of man. In textiles the attractiveness of the goods is often strikingly apparent as against English competing goods. The designing is more tasteful, the dyeing and finishing more effective, and the superior "selling quality" thus secured is undoubtedly due to the technical training of the designers and dyers, which they have received in splendid schools provided

by legislatures and municipalities for the purpose. The commissioners would hesitate to express this judgment upon the products of foreign manufacturers and artisans were it their opinion alone, but it is evidently the unbiased verdict of the British public, who purchase the foreign manufactures which the commissioners saw produced on British machines, while at the same time similar machines in England are idle and English operatives out of employment, the bread being literally taken out of their mouths, while the capital of the manufacturers is being eaten away by this alarming competition.

Mr. Swire Smith evidently thinks technical education most necessary, but he is not of opinion that our shorter hours are a disadvantage, or that our manufacturers, merchants and men require more than a better training or a better appreciation of the fact that exertion on all sides and greater adaptability are necessary if our trade is to be maintained. It seems to be believed on all hands that one of the first desiderata is the teaching of drawing, both free-hand and geometrical, but particularly the latter, in all schools. Professor Huxley says that a child who has been taught to make an accurate elevation, plan and section of a pint pot, has had an admirable training in accuracy of eye and hand. This is what is sought to be effected by the teaching of drawing, accuracy of eye and hand. Object lessons such as are used in Kindergarten schools, and the use of tools, is also advocated as tending to secure the same end. It is not desired to form trade schools in schools used for general education, but that the system of education should include lessons which will train the hand and eye as well as the brain, and it is contended that such work will be a relief to the pupil; that, as a fact, he will be able to do his bookwork better and to better advantage, and that he will get a training adapted to the requirements of his lifework.

In support of this view, the work done by half timers in the Board schools is illustrated, it being found that, though they do not work half the time of the full timers, the knowledge acquired is very nearly as great as theirs.

I believe that one of the first and greatest desiderata is a knowledge of modern languages. I think that it would be an exceedingly good thing if every male in the country were obliged to learn at least one modern language.

I feel most deeply the want of such knowledge in myself, and what is easily learnt in youth is not by any means so easily learnt in manhood; I also find considerable difficulty in getting

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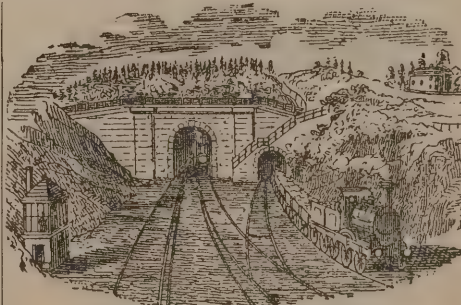
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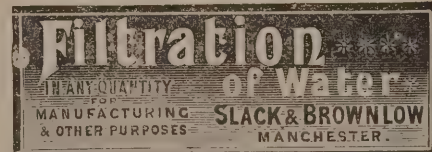


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assistants who can speak the language of the country to which it is desired to send them, therefore I know that, though no doubt there has been an improvement in this respect since my school-days, such improvement has been only on a limited scale and has not gone nearly far enough.

I have already said that, in my opinion, merely theoretical teaching would be useless, or nearly so, that it would not tend to produce either good engineers or good workmen; that the teaching, whatever it is, should be directed primarily to fitting the pupil for his lifework, and that a knowledge of at least one modern language and of drawing is essential. If this view of the matter is correct, how is it to be obtained?

Well, my view is that you must begin at the beginning, that the Board schools must give object lessons, not only in the first standard but throughout the course of study, that drawing must be taught, that for workmen the old system of apprenticeship must be reverted to, and that apprentices must be encouraged, and, if necessary, obliged to attend evening classes, where their knowledge of drawing and of construction shall be extended in accordance with the requirements of the industry in which they are engaged. There is a school of this description in Birmingham, which is, I believe, doing good work, and I understand that there are others about the country.

The tendency is almost sure to be for these schools to be at first too scholastic and bookish, and not sufficiently practical; but I think this will come right of its own accord; if not it will have to be set right by the men themselves, for nothing, in my opinion, is so much to be deprecated as simple theoretical instruction without practical illustration.

If it be granted that technical education, an education supplementary to that of the Board or the public school, and though following on from it, more directly connected with the lifework of the pupil, is necessary, who is to provide these schools, and under whose direction are they to be managed? If the example of Würtemberg is to be followed, there would be a central board, the pupils would contribute their small share of the expense, and the rest would be borne, half by the town or village in which the school was situated, and half by the central departments. I very much doubt, however, if it would be wise to follow the lead of any foreign country in this respect; our individuality is different from theirs, and so are our requirements. Central boards are not in great favour here, and I think that the masters and the men, the merchants and the manufacturers, the agriculturalist and the labourer could manage matters between themselves much better than they could be

managed by any central authority, and that if each district were allowed to tax itself to a reasonable extent for this purpose that would be all that is requisite, the rest would come of itself. It may be said that this would throw a heavy burden on municipal taxes, and that a portion of it should be borne by the imperial taxation, but, after all, what is the difference? If such schools as I have spoken of were universal, as they would have to be if they were to be of any use, the tax, whether paid by imperial or local taxation, would fall practically on the same persons and come out of the same pockets, or if this be not quite true it is very nearly so.

Most towns are given up to a large extent to one industry, therefore the schools in that locality would be directed towards giving instruction adapted to the furtherance of that particular industry.

It has been contended that there would be great difficulty in obtaining teachers, but I think this is a mistake: there are thousands of draughtsmen and foremen in London and the country who are much better able to give instruction in technical work than a simple teacher would be, because they know the practical side of it, and who would be very glad to eke out their not too liberal salaries by teaching.

Finally, the view I have taken is that technical education is necessary, that it should begin in primary schools, where drawing and modern languages should be taught and object lessons given throughout the course, that it should be supplemented by an improved system of apprenticeship, with which should be coupled an obligation or very strong encouragement to attend evening classes, in which the teaching of languages should be extended and instruction given in drawing and in such knowledge as is best adapted to the lifework of the pupil, whether he be a clerk, a draughtsman, a mechanic, an agriculturist, or what not. The subject is such a large one, and, to my mind, of such importance, that I must confess to having fallen far short, in these remarks, of the aim which I had set before myself, but I have found it quite impossible in the short space of an address to deal with it fully, and I can only ask your forbearance in this respect. However, if I have succeeded in giving you cause for thought and for examination into this momentous question for yourselves, I have not altogether failed in my object, which, whether I have taken a right or wrong view of the subject, must always be the advancement and well-being of our native country, and especially of the engineering profession in that country, and I am hopeful that extended education may enable the workmen and the neighbouring

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classes to see for themselves what are our real requirements, and to insist that we shall have a real army and a real navy, the best of guns and armaments, that inventors shall be encouraged and not snubbed, that work shall be honest, and that whether it be in fighting, in diplomacy, in commerce, in manufacture or invention, we shall be before the nations, not behind them.

### THE DIVER AND THE OCTOPUS.

A PARALLEL case to the one imagined by Victor Hugo in his "Toilers of the Sea" is reported from Wellington, New Zealand. A man named Alexander McGovan, engaged in the harbour improvement works, went down in his diving-dress for the purpose of setting some large blocks under the water in which piles had been previously driven. As McGovan was in the act of placing one of the blocks, he was seized by an immense octopus. The monster fastened on to the piles at the same time. McGovan at first made an attempt to get clear, but the more he fought the octopus the more he found that it was useless, as its grip became stronger. He then wisely desisted, and in a few moments had the satisfaction of knowing that the octopus had released its grasp of the piles. This was no sooner done than McGovan gave the signal to be hauled up. His signals were quickly responded to, and up went the diver with the creature on his back. Its legs measured 9 feet long. McGovan certainly had a narrow escape, and it was only by his discreet quietness that he turned the tables on the octopus.

### PATENTS.

*This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]*

#### APPLICATIONS FOR PATENTS.

17896. Carl Romany, for "Hasp and staple which can be fixed on any door no matter how limited the space." December 7, 1888.

17916. Sidney Nash Castle, for "An improvement in or connected with rustic or other summer-houses or similar

shaped shelters, band-stands, and like structures." December 7, 1888.

17962. John Wilkinson and James Bingham Allott, for "Improvements in destructors, or apparatus for treating refuse." December 8, 1888.

17966. Cecil George Saunders, for "Improvements in scales for use in enlarging or reducing maps, plans, or the like representations." December 8, 1888.

17970. William Lindsay, for "Improvements in the construction of window-sashes." December 8, 1888.

17990. William Blamforth, for "An improved method of securing door-knobs and the like to their spindles." December 10, 1888.

17991. James Duckett and Alfred Duckett, for "Improvements in and relating to water-closets." December 10, 1888.

17995. John Elliott Hewison, for "A compound set square." December 10, 1888.

18038. John Strachan and John Aleflett, for "Improvements in securing sash-lines to sashes and for similar purposes." December 11, 1888.

18042. Alfred Edward Harris and Howard Joseph Luckock, for "Improvements in spring catches for doors." (Complete specification.) December 11, 1888.

18049. James Hume Gibson and William Glazier, for "Improvements in or appertaining to step-ladders, collapsible A-formed supports, and the like." December 11, 1888.

18070. Thomas Arundel Aldridge, for "An improved chimney-pot and ventilator for insuring an upward draught." (Complete specification.) December 11, 1888.

18073. John Ferguson, for "A fireproof ventilating hearth." December 11, 1888.

18139. Howard Pullar, for "Improvements in devices for securing or locking screw-nuts." December 12, 1888.

18155. Herbert Linskill Joy, for "Improvements in ladders and fire-escapes." December 12, 1888.

18177. Henry Richard Gregory and George Macdonald, for "Improvements in the manufacture of filtering material, applicable to the filtration and purification of water, sewage effluents, saccharine juices, alcoholic liquors and other liquids and fluids." December 12, 1888.

18195. Henry Heaton and Wilbraham Knight, for "Improvements in chimney-pots." December 13, 1888.

18204. Anne Proctor, for "The speedy lighting of fires to be called 'The Instant' fire-lighter and kettle-boiler." December 13, 1888.

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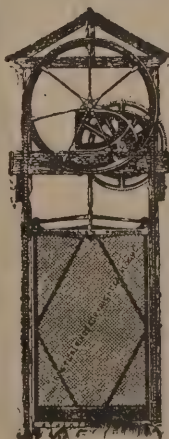
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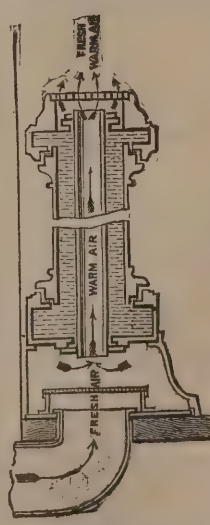
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## PROVISIONAL SPECIFICATIONS ACCEPTED.

14665. Will Whalley Cottam, for "Improved method of flushing water-closets." October 12, 1888.

15420. Frederick Samacraft, for "Improvements in windows and window fastenings." October 26, 1888.

15461. David Burns and James Blyth Cairns, for "Improvements in apparatus for regulating and fixing fanlights, ventilators, casements, mirrors, and other articles of furniture moving on pivots or hinges." October 27, 1888.

15543. Edgar Newton, for "Improvements in the construction of horticultural and other buildings, and ventilation of the same." October 29, 1888.

16113. Peter Evans, for "Improvements in, and in the manufacture of cement." November 7, 1888.

16169. Francis Fryer Abbey and Albert Walshaw, for "An improved chimney-pot for the prevention of down-draughts." November 8, 1888.

16354. Robert Henry Taylor, for "Double cone mixing-machine, for concrete and other purposes." November 12, 1888.

16574. St. John Vincent Day, for "Improvements in ventilators." (Peter Smith Swan, India.) November 15, 1888.

16774. Burton Richard Philippson, for "Improvements in the disposal of sewage." November 19, 1888.

16901. James Smith Naylor, for "Improvements in and appertaining to automatically-closing doors, applicable for preventing the spreading of fire in mills, warehouses, or like buildings." (Marshall Tillotson, United States.) November 21, 1888.

17312. Richard Warwick, for "Improvements in fibrous plastering work, and in materials used for same, and in the manufacture of slabs or plaques in connection with the same trade." November 28, 1888.

## COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office on the prescribed form of such opposition.

17326. James Hill, for "Apparatus for opening and closing fanlights and skylights." December 16, 1887.

284. Moses James Adams, for "Improvements in floor tiles." January 7, 1888.

1295. Richard Ridgway Harrison, trading as Loach & Clarke, for "Improvements in devices for opening, closing, and adjusting fanlights, sashes, and the like." January 28, 1888.

1394. Clement John Heaton, for "Improvements in the production of ornamental work for walls, and other surfaces." January 30, 1888.

1587. Carl Gustave Garbe and Kate Ross, for "Improvements in attaching doors and like knobs, and other handles, to their spindles." February 2, 1888.

1884. Richard Muirhead, for "Improved construction and arrangement of apparatus for the separation of liquids and semi-liquids from solids, especially applicable to sewer sludge, slip, slurry, and other like bodies." February 8, 1888.

2272. John Bassett and Francis Napier Seyde, for "Improvements in the construction of fireproof ceilings and partitions." February 15, 1888.

7211. Isaac Thomas Hawkins, for "Improvements in the construction of sewers." May 15, 1888.

16272. Benjamin Holbrook, for "Improvements in ventilators." November 9, 1888.

## PATENTS SEALED, DECEMBER 14, 1888.

11937. Julius Homan, for "Improvements in the construction of fireproof floors." September 2, 1887.

13133. William Phillips Thompson, for "Improvements in stamping or beating machines for moulding artificial stones and the like." (Joseph Winkler, Germany.) September 28, 1887.

16262. Francis Napier Seyde, for "Improvements in metallic lathing or backing for plaster or cement partitions and ceilings." November 26, 1887.

16375. Alfred Dougill, for "Improvements in baths, or combined bath and hot-water tank or cistern." Nov. 29, 1887.

16578. Samuel Green Bennett, for "Improvements in the construction of hoists and lifts." December 2, 1887.

574. William Joseph Balk, for "Improvements in street gullies and traps." January 13, 1888.

8609. Miquel Pinder, for "Improvements in erasers, and in attaching same to pencils and penholders." June 12, 1888.

10706. George Evans, for "Improvements in the construction of window-frames and hanging the sashes." July 24, 1888.

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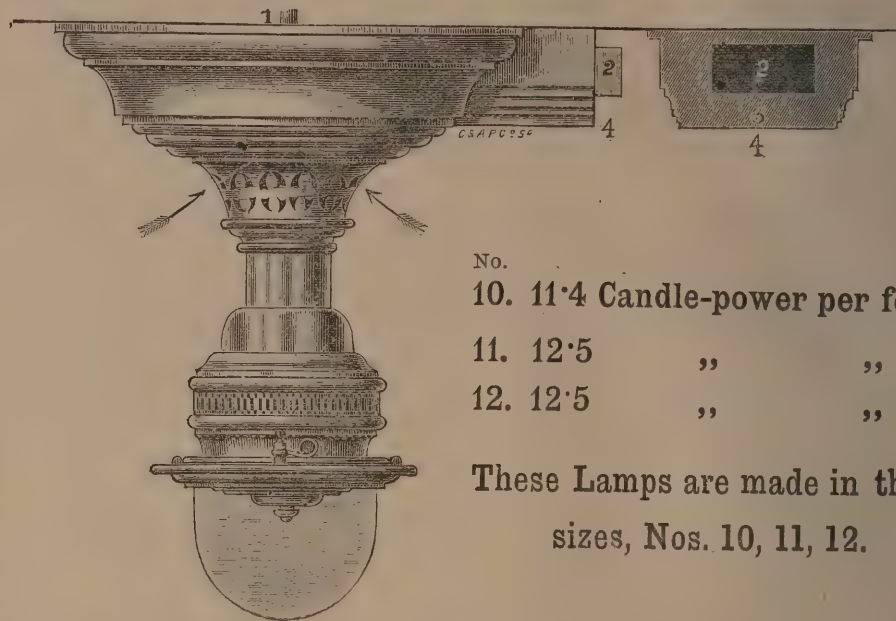
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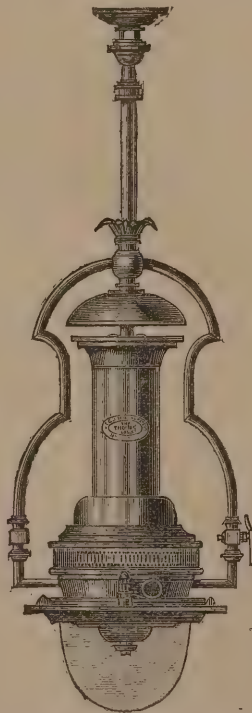
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# The Architect.

## THE WEEK

VISITORS to Paris next year will be able to see several examples of panorama painting. The last century will be unfolded on the great canvas which MM. GERVEX and SARGENT have in hand. The fifteenth century will reappear on one which will be devoted to the life of the heroic JEANNE DARC. The latter will be exhibited in a structure in the Avenue Bosquet, which will be, to some extent, a reproduction of the cottage in Domrémy where the Maid of Orleans was born in 1412. The designs have been prepared by M. FRANSQUIN-ARVENT. The paintings will be the work of M. PIERRE CARRIER-BELLEUSE, a son of the late sculptor. He is about to visit Compiègne, Rheims, Domrémy, Vaucouleurs, and the various scenes of incidents in the tragic history of the heroine. By February 1 it is expected the materials will be collected and the sketches completed. The canvas will then be attacked, and if all goes well the panorama will be opened on May 8, the anniversary of the birthday of JEANNE DARC.

THE Munich Academy of Art insists on expedition as a quality for painters and sculptors. The schools were opened in the last week or two, and the subjects for competition are now prescribed. The works must be completed by January 15 of next year. For the painters one subject is assigned, viz. *Evening*, which may be treated as a landscape, as *genre*, or as history painting. The sculptors can take a subject from the legend of PSYCHE, and from it produce a single figure, a group, or a relief.

THE Waterford guardians of the poor are too generous. They have just issued an advertisement in the form of a poster for a plan and specification for a hospital building 100 feet long and 18 feet wide, which are to be submitted to those worshipful gentlemen on or before Thursday next. The documents are to be accompanied by "a statement of the architect's fee," but it is not to be supposed that all the competitors will receive a donation, for the approved plan only will be paid for, and the guardians do not bind themselves to accept any plan. It is rather novel to find designs sought after by the agency of the bill-stickers, as if architects were dust contractors or suppliers of turf or potatoes. Waterford is a stronghold of advanced politics, and so simple a way of doing business without any conventionalities of decorum is an indication of what architects may expect under the coming régime.

THE annual meeting of the Royal Institute of Architects of Ireland was held on Saturday last. Mr. DREW, R.H.A., presided. The report referred to the proposed affiliation with the Royal Institute of British Architects, but the council did not see their way to recommend the step at once. It would be attended with the danger of their Irish Institute losing its identity, and while willing to co-operate with the British Institute in the interests of the profession, the council deemed it better to preserve their independence. In the last report it was stated that should any of the Irish students desire to enter their names for the examinations held by the British Institute, the council would be happy to make arrangements for the examination in Dublin. The report also dealt with the irregularities of the Irish officials, which formed the subject of a correspondence with the departments. The paid officials of the Board of Works and the Local Government Board not only prepare special plans of buildings for private persons, but in some cases they also inspect them, thus taking upon them duties which are entirely outside those for which they receive their salaries, and which properly belong to the practising members of the profession. The Board of Works referred the council to the Local Government Board, and the latter passed them on to the Treasury, and their reply simply amounted to a refusal to make any alteration in the working of the system. The council therefore intend to get the matter brought before Parliament during the coming session. Mr. O'CALLAGHAN said the feeling was very strong against the amalgamation of

the Irish Institute with the Royal Institute of British Architects. They should maintain their individuality, and they had frequent experience of the advantages attending membership of an Institute like theirs in courts of law and elsewhere. Mr. DREW pointed out the necessity of obtaining a Building Act for Dublin, and suggested that as next year the Institute would have reached its fiftieth year, something should be done to mark so interesting an occasion.

UP to Friday last the sales in the Exhibition of the Manchester City Art Gallery amounted to 3,731*l.* 18*s.* As that sum represents eighty-two pictures, the average was not more than 45*l.* This is a lower rate than usual, and, it is to be hoped, is a sign of a temporary depression, and no more.

A CURIOUS case has been decided in the Hamilton Sheriff Court. In 1887 Stevenston House, which was in course of erection, was destroyed by fire. A firm who had undertaken the carpentry and joiner's work claimed for certain extras, as well as for work executed. It appears, however, that they had received written notice that extra work was not to be undertaken unless an order in writing was given. The case was heard at great length, and the Sheriff remitted two questions for report to Mr. MITCHELL, architect, Airdrie. One was whether the plaintiffs were entitled to extras for which written orders could not be shown, and the second was whether they were entitled to be allowed for woodwork which was not fixed at the time of the fire. Mr. MITCHELL decided the first question in the affirmative, and the second negatively. The Sheriff has acted on the architect's conclusions, and has mulcted the plaintiffs in costs.

WE published illustrations a few years ago of the Victorian Parliament House, and it was evident from them that the designer, Mr. KERR, was an architect of great ability. But in Australia, as in Europe, an architect's merit does not receive due recognition. The Buildings Commission in last April recommended that Mr. KERR's salary should be increased from 630*l.* per annum to 1,050*l.*, and that he should have the rights of the first-class professional division of the public service. It will scarcely be credited that the arrangement was not carried out in its entirety. It appears that, through some unknown reason, a less generous remuneration will have to be accepted. By a recent resolution, it is proposed to enter an amount of 5,000*l.* on the estimates in order to provide an annuity for Mr. KERR. It is at the same time recorded that Mr. KERR has devoted a long time to his great building, and received small remuneration. The case is to be regretted; but at the same time we hope it will serve as a warning to official architects. If they pursue the even tenor of their way, they are likely to be happier than if they give way to ambition and seek extra commissions. Experience shows that public bodies are not to be trusted unless a bargain is made before an architectural work is commenced, and they have always little compunction in leaving one of their servants in the lurch. Mr. KERR has been unjustly treated, but he should have suspected dealings by which he was rewarded with 500*l.* or 600*l.* a year.

THE new statue of the Duke of WELLINGTON opposite Apsley House, which was unveiled a week ago, does not dwarf the surroundings by its excessive size. It is evident that a truer notion of the value of scale is spreading among sculptors. Another good feature is the mosaic platform, which imparts colour, and is a good specimen of Messrs. BURKE & Co.'s handiwork. There is no chance of variation in representing the great Duke, for he must appear as he did at Waterloo. The introduction of figures of English, Irish, Scotch, and Welsh soldiers at the angles of the pedestal is an innovation, for the stereotyped design used to suggest that the Duke defeated the French army by pointing his telescope at them. The figures in Piccadilly are fair examples of Mr. BOEHM's skill, but it would be too much to expect that he could take more interest in them than if they were mythological beings. For a national monument at least an Englishman should be selected.



## THE ARCHITECTS OF WESTERN AMERICA.

IT is exactly four years since we noticed the proceedings of the first convention of the Western Association of Architects, which was held at Chicago. Knowing how few were the practical results from the congresses of architects in this country, we were compelled to admire the more definite aims of their American brethren. The Chicago architects, we wrote, "see no necessity for separating architecture from architects, and the first place in the programme is given to subjects which are essential to the existence of the profession." The successive meetings or conventions have been no less consistent, and every year something is done towards the improvement of the profession of architecture by inducing the members to cultivate *esprit de corps*, and compelling the public to recognise that an architect is the equal of the surgeon or the lawyer.

The fifth convention, of which a report appears in a special number of the *Inland Architect*, was held in Chicago last month, under the presidency of an Englishman, Mr. SIDNEY SMITH, of Omaha. In his address, Mr. SMITH, while admitting the good work which has been accomplished in overcoming prejudice both within and without the profession, pointed out how much remained to be undertaken. It was, he said, of the utmost importance that all the architectural societies of the States should form one consolidation or confederation, which should be under one direction and governed by one code of ethics. In the ranks every reputable practitioner of architecture in the United States who can comply with the code of ethics so established should be enlisted. The confederation should be possessed of a fund sufficient to support a bureau of professional information and legal advice for its members. In a young society like that of America there is less difficulty in confederating than in this country, and there may also be an advantage for Americans in the process, although it may not be plain to us. But the foundation of a bureau of information (assuming, of course, that the words can be taken literally) does not sound well, although it may serve as a bait for architects, if there are any in the Western States, who are rather wanting in the knowledge which should be possessed by every man who practises as an architect. If technical information can be imparted on application to the bureau, what is the use of a long course of training or an investment in books of reference? Once open a depository of knowledge, and it will be difficult to draw the line between applications for ordinary and extraordinary information and to define the things architectural which should be generally known. Then, again, in a country like America how is secrecy to be maintained in the business of the bureau? A Western VITRUVIUS may startle his township with the extent of his knowledge about some historical or practical matter, and in consequence obtain the honour of a report with sundry lines of tall capitals for heading. But suppose it leaks out that he derived his facts direct from the bureau, there is no knowing what might befall the orator. The American architects wish to be as much esteemed as members of other professions; but, if so, it is hardly wise to seek after an institution which neither attorneys nor doctors would care to imitate for themselves. With keen-eyed people like the Americans we doubt if anything could be more dangerous than to suggest that professional knowledge is readily and cheaply obtainable, and the proposition for the setting up of a bureau we consider as the weak point of Mr. SMITH's address.

As well as we can discover, there was nothing done during the meeting to carry out the President's idea. Already a committee for collecting legal decisions in building cases exists in connection with the Western Association, and no objection can be raised to the work of the members if kept within due limits. Even the best of the American lawyers, it is stated in the committee's report, are poorly posted in building law and are unsafe advisers. We get a glimpse of American courts in the lamentation over lost time, which the report expresses in this fashion:—"How many good and serviceable hours have all of us spent in court-rooms while a couple of lawyers who knew little, a judge who knew less, and a jury that knew nothing about the relative claims of the contestants, or the many complications connected with the erection of a building, were

endeavouring to settle some trivial misunderstanding, which the architect, if backed by proper precedents, could have adjusted to better advantage alone." We have spoken above of limits, and it may appear an ungracious suggestion, but the report admits that "the indefiniteness of the committee members' ideas on the subject was the greatest obstacle in getting serviceable work from them"! The first work necessary was, therefore, to instruct the committee, and a volume was prepared "somehow for that purpose, which an enthusiastic committee-woman, Mrs. LOUISE BETHUNE, declares to be "a hand-point and clear model for future work."

One of the dreams of the committee is to get hold of that prodigy which is as rare as the phoenix—a lawyer who is willing to work without any thought [of fees, and finds sufficient remuneration in the honour which he received by being consulted by the architects. As yet he has not turned up; but that the wonderful lawyer exists, and will some day come and solicit employment and carry on cases "contented with the honour for his emoluments," as one member expressed it, are among the beliefs of the Western architects.

The question of licensing architects was one of the first debated at the convention. A committee has charge of it, but as yet the various legislatures are indifferent to its advantages. One architect who tried to operate on the American makers of laws said how "they looked upon the asked-for legislation as they do on some other trades union measure—something to enable architects to earn a little more money—and they paid no attention to us." Another architect related that he had had considerable talk with most of the influential members of the Ohio Legislature regarding the Licensing Bill, but they said some years must elapse before it could be passed, as the public would be very much opposed to a bill which would compel a man to go to an architect for plans and specifications whenever he wanted to build. The chairman said that from his experience the only difficulty in the way of rushing the bill through the Legislature was want of money. According to a fourth speaker, the legislators considered the Bill to be a scheme by which architects sought to cut out the country carpenters from constructing such small buildings as they are in the habit of constructing, and thus to deprive them of rights. Mr. CLAY, who was one of the pilots of the obnoxious Bill, explained how they proposed to get over the carpenter difficulty by agreeing that builders should be privileged, but that other people who practised architecture as a business should take out licenses. He admitted that every one had as much right to be his own architect as to be his own physician or his own lawyer, but when a man who took employment from another as an architect, or described himself as "practising architect," he should show some guarantee of the proficiency like the druggist, physician, dentist, and attorney. But the value of a guarantee which depends on an examination was suggested by Mr. ADLER afterwards when he said there was nothing in the Bill to prevent the tailor or the shoemaker from practising architecture provided the examination of the State Board is gone through. Can any one suppose that in America or in England the examination would be sufficiently comprehensive to be a fair test of ability, or would go beyond what is required for the humblest sort of technical employment under the State? In England it is well known that the demand for the registration of architects is advocated by no more than a few people, and the little interest taken in the subject in America is evident from the acknowledgment of Mr. CARLIN (who was afterwards elected president) that he had not seen a copy of the Bill. When a leading architect does not trouble himself about the proposals, the legislators are acting rightly if they turn a deaf ear to the diplomatists who wish to make use of them for the passing of a measure when there is not unanimity among architects upon its merits.

Many will say that, with a system of registration after examination, there would be clearer ideas upon questions of professional ethics, and a more agreeable recognition of one's rights. The committee of forty-eight members that had been appointed by the Western Association to prepare a code of ethics seem to believe in the advantage of doing nothing. "I have allowed things to take their natural course," says Mr. SULLIVAN, the chairman, "and have heard



nothing from the sub-committees, and the sub-committees have also allowed things to take their natural course, and have heard but little from me." Yet he considers, and justly, that a code is needed which should define the relations between architects and between clients and architects. It should state, says Mr. SULLIVAN, when one architect is having business relations with a client, that that shall be a sufficient warning that interference on the part of another architect is non-professional and not allowable. It will be admitted that the utility of the regulation need not be confined to America, for something of the kind is required in this country. A report on ethics may be expected for the next convention, since a committee consisting of Mr. SULLIVAN is to prepare it.

A case which illustrates the elasticity of what passes for ethics at present was brought before the convention in a letter from Messrs. SMITHMEYER & PETZ, architects, of Washington. Fourteen years ago their design was accepted after a competition for the Congressional Library of that city. But the perpetual changes of committees, which appear to be an institution in America, involved corresponding transformations of the plans before an order to build was given. An extract from their statement will suggest the trials of the architects:—

For a period of thirteen years, from one Congress to another, we would modify, change, curtail, enlarge, &c., &c., to conform to the ideas of the "powers that were." In this endeavour no less than twelve different designs of the exterior were prepared in various styles of architecture, in Gothic, Romanesque, French, Italian, German, Renaissance, &c. Vast numbers of plans, sections, and studies were made and submitted to try and satisfy the various tastes of the members of the committees, until finally the Congress of 1886 adopted the plan in the Italian Renaissance style, naming our plan specifically in the Act. For all these plans, for our services as expert architects requested by these Congressional committees, extending through a period of thirteen years, and for the heavy and onerous expenses to which we have consequently been subjected (including a trip to Europe by the senior partner, for which only travelling expenses were allowed), no compensation has been paid or allowed.

The works were hardly started before the architects found they were superseded. The reasons for this step, they say, are well known to the profession in America. It was, they assert, because they declined to accept work and materials which did not correspond with the requirements of the specification. In such a case influence is everything in Washington lobbies, and as Messrs. SMITHMEYER & PETZ are less powerful in that way than their opponents, the commission for the building, which was to cost four million dollars, was taken from them. The amount of compensation is left to the settlement of the Secretary of the Interior, who will naturally object to saddle the administration to which he belongs with an outlay which former ministers incurred. Cases of the kind are not, however, uncommon in America, and for that reason probably the convention made no fuss over the Library scandal. One member quoted the opinion of a congressman to the effect that it was only a result of the competition system. Afterwards the letter of Messrs. SMITHMEYER & PETZ was referred to a committee having charge of another subject.

The subject which engrossed most attention was consolidation, or, in other words, the proposed amalgamation with the American Institute of Architects. In America, as in England, there is an active centralising spirit at work, and the aim of it is to break down independence in all forms. The Western Association is a young and go-ahead Society, the American Institute is the oldest Society of the kind in America, and as age counts for much, it can set up claims for many qualities which few would care to question. It was therefore proposed, and the general interests of the profession were put forward as the main inspiration of the proposal, that the two societies should become one. But the American Institute, while willing to admit the members of the Western Association into its ranks, insists on certain conditions. In the former there are grades, whilst in the West the principle of equality is acted upon. The Institute wants to place three hundred members of the Association in the grade of Associates, and will allow the full rights of membership to only half that number, or, in other words, to one-third of the Western Association. Can any equivalent be obtained by the architects, who are thus declared to be of inferior quality, although it is not clear what kind of test was applied to assess their merit? Nothing appears in the reports to settle the question, and if many members will

not decline to allow themselves to be classified as associates according to the whims of a few office-bearers, it will be a sign that the lamp of sacrifice in regard to private interests burns brightly in the West.

It is difficult for a stranger to understand both sides of the question of consolidation, but apparently the Western Association is risking everything that is characteristic by the leap in the dark which it is about to undertake. For the reflected respectability which is supposed to come from the union with the older Society, it will have to sacrifice the liberty which has already produced so much good. We know of no Society with so short an existence that can produce a more creditable record than the Western Association, and yet the future is to be jeopardised; perhaps it would be nearer the truth to say that the Association is not to have a future, because there are some men who believe in a mammoth Society in which the members will be compelled from their numbers to leave the government to a few.

At every convention of American architects the defects of the Government officials are sure to be proclaimed. The last one at Chicago was not an exception. The committee who have charge of the efforts towards obtaining a reform have to admit "that there was no sympathy with the movement in the Committee on Public Buildings and Grounds of the House of Representatives." The legislators considered the Government buildings at Washington and the Government buildings about the country to be the *ne plus ultra* of architectural achievement. With so much infatuation in Congress it was vain to urge that any amendment of the process for producing public buildings was necessary. The committee, strange to say, do not propose any attack on the Government system by the consolidated societies. They recommend that every member "should constitute a committee of one, charged with the duty of calling forth from individual citizens, and from the press, expressions of opinion upon a system under which the Government of the United States cannot employ in its professional service architects of as high standing and as great professional and business ability as those employed by wealthy corporations, or even by the average private citizen." If in a case of this kind consolidated effort is futile, what reason is there to expect that it will conquer in architectural affairs in which the public or the Government will be on one side? If individuals can succeed in bringing about a reform of the architectural department of the Government, they might be trusted to look after their own affairs. If they should fail, they cannot anticipate much aid from the magnified American Institute.

With the aid of the Western builders, a form of contract has been prepared by a committee of the Association, and will in time be accepted by architects and builders. In order to avoid any chance of introducing modifications which might affect the tenor of the clauses, the form is copyrighted, and will therefore have to be used as prepared or not at all. But practical work of that kind is not likely to be repeated under the new conditions, which will be prohibitory of experiments that are not initiated in New York.

The only subject of an extraneous kind that was considered related to the introduction of the metrical system. From an inquiry made among the civil engineers of Boston it would appear that they are in favour of an abandonment of the units at present employed. Mr. ADLER, who is a prominent member of the Western Association, found that the metric system is now considered as a blessing in most parts of Germany. In America there is a diversity of opinion upon the subject, but as a conference of the American Customs Union will be held next year to consider uniformity of weights and measures, it is considered that the metric system may gain the day.

This convention will, we suppose, be the last of the Western Association of Architects, and henceforth it will neither have local habitation nor name. As a branch of the American Institute it may hold meetings at which papers will be read, but the proceedings will have lost the interest of past years. The Western architects will have to go far from Chicago for guidance, and must submit themselves to leading strings. If any compensation will be forthcoming for the loss of independence, the change may be condoned, but at present there is no prospect of the Western architects finding more respect from their clients or less rivalry among themselves.



## THE SOCIETY OF FRENCH ARTISTS.

ON the 27th of this month, says the Paris correspondent of the *Times* when writing last Friday, the Society of French Artists will hold its annual meeting, and there is every prospect of a severe conflict. This society consists of all persons whose paintings, &c., have been exhibited at the Paris Salon. There are now upwards of 2,400 members, and they elect a managing committee of ninety fellow members. The Society has existed eight years independent of State control. The committee of ninety has appointed a sub-committee of twenty-six, nine forming a quorum, and the members of the sub-committee are practically masters of the situation. It is urged that the committee has behaved in an autocratic manner by imposing rules without consulting the Society, bringing members together only once in the year, and allowing no proposals to be made unless they are sent in at least a week in advance, and bear the signatures of 100 members. Of course it requires much time and patience to go the round of so many studios. Nevertheless, this has been done in the present instance, and a proposal bearing 115 signatures will be presented, demanding such alterations in the rules of the Society as will insure a constant change in the members of the jury who are to judge what works of art shall be exposed in the Salon. Many of the best-known artists have signed this requisition, notably MM. Carolus Duran, Dalou, Detaille, Cazin, Gérôme, Regamey, Roll, and Meissonier.

In order to carry out the project it will be suggested that a committee of 120 artists shall be elected freely by the whole Society. Half this committee will constitute the jury, and they will be appointed by the drawing of lots. Thus, even if the same persons were constantly re-elected on the committee of 120, the acting jury would be varied by the hazard of the lottery. Further, it is proposed to divide the work and the jury into five equal sections, so that each jurymen should have less to do, and be able to perform his task more conscientiously. By submitting at present all the pictures to one single jury the strain becomes too great, and the eyesight and judgment of the jurymen are seriously impaired, at least for the time being. Moreover, the jurymen, being to some extent independent of the control of the Society which they represent, are open to accusations of partiality. It is said, for instance, that preference is shown to pupils from the schools of teachers on the committee, and that these teachers insure their own re-election by admitting as members of the Society so many of their own pupils. This places the artists who do not attend any school at a great disadvantage.

Whether these assertions are justified or not, there is a strong feeling in favour of modifying the regulations so as to prevent any monopoly in the management of the Paris Salon, and to promote the interests of French art.

## KIRKSTALL ABBEY.

WE have pleasure in stating, says the *Leeds Mercury*, that, through the munificence of Colonel North, Kirkstall Abbey will now become the property of the town of Leeds. By his very liberal gift to the Infirmary, the Yorkshire College, and in other ways, Colonel North has shown the great interest which he feels in his native town, and it will afford much gratification to the inhabitants of the borough to learn of this, his latest act of generosity. It may be recollected that at a recent meeting of the Town Council a resolution was adopted authorising the purchase of the abbey for the sum of 6,000*l.*, and at the recent sale of the Cardigan estates in Leeds the Town Clerk (Sir George Morrison) offered 6,000*l.* for the abbey and grounds, but it was refused, the reserve price being 10,000*l.* On Friday week—the concluding day of the sale—it became known that negotiations had been entered into for the purchase of the abbey and grounds, and also the Abbey House, by gentlemen who intended to utilise the two estates as a place of public amusement. This having come to the knowledge of Councillor Edmund Wilson, he at once offered the reserve price for the property, namely, 10,000*l.* for the abbey and grounds, and 3,500*l.* for the Abbey House. On Tuesday, when the contract was completed, Mr. Wilson sent a letter to the Mayor offering the abbey estate to the Corporation for the sum of 10,000*l.* The Mayor had an interview with Alderman Sir Edwin Gaunt, who, with the concurrence of his worship, gave notice that he would move at the next Council meeting that the Corporation purchase Kirkstall Abbey and grounds for the sum of 10,000*l.* In the meantime, Colonel North became acquainted with the position of affairs through Mr. Charles England and Mr. A. D. Holmes. These gentlemen, on behalf of the Leeds Mechanics' Institution and Literary Society, had an interview with Colonel North at the Hôtel Métropole in London, their object being to solicit his assistance towards the expenses incurred in the erection of a new building for the Boys' Modern Day School. A gift of 250*l.* was promised, and it was

arranged that Colonel North should be present at the opening ceremony on January 15. Mr. England and Mr. Holmes then mentioned the question of the sale of Kirkstall Abbey, and a fear was expressed that the estate might not be secured for Leeds. Colonel North said, "I will, if I can, purchase the abbey and present it to the town." Negotiations were immediately entered into with Mr. Wilson, who was informed that Colonel North wished to take the contract off his hands for the purpose of presenting the abbey to the town. Mr. Wilson agreed to the suggestion, and on the 21st the Mayor received from Colonel North the gratifying intimation that he intended to purchase Kirkstall Abbey and grounds from Mr. Wilson, and to make a free gift of them to the borough of Leeds. In reply, the Mayor sent the following telegram to Colonel North:—

"Have just received the gratifying intimation that you have generously offered to present Kirkstall Abbey to the borough of Leeds. Please accept my warmest thanks on behalf of the inhabitants of the borough of Leeds."

## THE NEW PARIS LABOUR EXCHANGE.

THE most practical result achieved by the labour organisations of Paris, says a correspondent of the *Times*, is undoubtedly the creation of the Labour Exchange. This will be so vast and remarkable an establishment that it will not fail to attract the attention of all who study French public institutions. Workmen are at present busy laying the foundations, on a site formerly occupied by a panorama at the corner of the Rue de Bondy and the Place de la République. The position, it will be seen, is very central, and the land was consequently expensive. It has been purchased by the Municipality for 40,000*l.*; but the expenses are further increased by the fact that the soil is very unsuitable for building purposes. A small stream, or water-course, formerly passed over this spot, and it is necessary to dig 30 feet below the level of the street and 5 to 6 feet below the water-level to reach a solid foundation. The building will rest on 90 piles, sunk through the earth and made of Portland cement. These are now nearly finished. As the foundations are the most difficult part of the undertaking, the architect hopes that the outer walls will be completed in time for the great Exhibition of next year.

On the basement of the Exchange will be the stoves, the ventilators, and the electric apparatus. Then there will be vast bare rooms with no other furniture than wooden benches. Here those labourers, porters, and workmen who at present are in the habit of standing at the corners of certain streets or open spaces waiting for employment will be allowed to congregate. They will at least be under shelter; while, on the other hand, employers will know exactly where to find the men they need. In this basement also provision is made for two offices for the registration of any demands for work and similar purposes. To prevent confusion, the basement is divided into three waiting-rooms of different sizes and is accessible by three flights of stairs. Above, at the main entrance, on either side of a large vestibule, will be found a porter's lodge, an office for general information, and a post, telegraph, and telephone office. The central yard beyond, roofed over, will become the large meeting-hall of the Labour Exchange. Efforts will be made to get this portion completed in time for the International Workmen's Congress to be held in Paris next year, probably in the month of August. The central hall will measure 24 by 22 mètres, and will therefore hold about 1,500 persons. But at the further end there will be a platform or stage measuring six by ten mètres and capable of holding some 150 more persons. This will prove very convenient when a society receives other societies, or for separating delegates from the general public. Further, there will be three smaller halls, divided only by partitions from the large hall, which might serve as lobbies in the event of a congress, or as places where smaller meetings could take place. These smaller halls will hold about 200 persons each. If, however, the partitions are removed and these smaller halls joined to the central hall, a meeting of more than 2,000 persons could easily be accommodated.

The first floor is destined principally for administrative purposes. The administration, or general managing committee, which is freely elected by the trade unions of Paris, will have a large committee-room with a special entrance and vestibule. Then there will be a room for the general secretary and six separate rooms for clerks. The Service of Statistics is to possess the same accommodation, namely, a committee-room, a general secretary's-room, and six clerks' offices. Here all general labour statistics are to be compiled and held in readiness for all practical purposes. Six more rooms are allotted to what are termed work inspectors. Some time ago a proposal was made for the appointment of five workmen inspectors, who were to visit all the places where work was done for the town, and see that the conditions of the contracts were faithfully executed, that the sweating system was not introduced, that the rate of wages, according to the series, or tariff, established by the town, was



duly paid, that proper precautions were taken to prevent accidents, and that the laws for the preservation of public health were strictly observed. The trade unions were to prepare a list of fellow trade unionists whom they desired to see appointed as inspectors, and the Municipality would select five out of this list for the purpose. The inspectors thus appointed were to be paid by the Municipality a salary of 12*l.* per month. This proposal was accepted by the Paris Municipality, but the Government refused to sanction the measure. Nevertheless, offices are to be built for these inspectors, the question will be revived, and it is anticipated that ultimately the Government will give its assent.

On the first floor there will also be a library, a reading-room, and a room for technical lectures. The second, third, fourth and fifth storeys are all to be built on the same plan. Each will possess a committee-room and 29 small and six rather larger offices. In these offices will be the secretary of a trade union, and perhaps one other official. When the society wishes to hold a committee meeting it can occupy one of the many committee-rooms vacant. If the whole trade desires to meet then one of the large halls will be at its disposal. The small offices measure about 10 feet by 13 feet, large enough for a secretary and one or two visitors. Thus on the upper floors of the building no fewer than 140 trade unions can be accommodated with separate offices. This is precisely the number of trade unions that now have their headquarters at the temporary premises in the Rue Jean Jacques Rousseau, where there are only 20 offices and two meeting halls. But all the societies will not go from the temporary to the new premises. It is proposed to keep the former as an *annexe* to the Central Labour Exchange. As it is very near to the Halle Centrale, all trades connected with the food supply of Paris might continue to have their offices in the Rue Jean Jacques Rousseau; and also the societies connected with commerce, such as associations of clerks, shop assistants, &c. At present the Paris Municipality, besides providing the temporary premises, gas, fire, and three attendants to clean, &c., allows the managing committee 800*l.* per annum for working expenses. This subsidy will have to be very largely increased when the trades remove to the new and vast Labour Exchange on the Place de la République.

According to the estimate, this building will cost, furniture included, 1,920,000*fr.*, and, together with the price of the land, make, in round figures, 3,000,000*fr.*, or 120,000*l.* M. Bouvard is the architect, and has selected for his façade a design at once serious and solid. There will be ten handsome pilasters with Corinthian capitals. Blocks of white stone will be employed. From three separate sides wide staircases give easy access. There will be both gas and electric light, and mechanical apparatus to insure ventilation. Altogether the plan is carefully prepared, and it may be said, without hesitation, that in no country has so elaborate a provision been made for the exclusive benefit of working-class organisation.

#### GLASGOW ARCHÆOLOGICAL SOCIETY.

A MEETING of the Archæological Society was held on the 20th inst., Mr. John Honeyman, architect, in the chair. Mr. Dalrymple Duncan, F.S.A.Scot., hon. secretary, stated that considerable alarm had been recently caused by certain proposed operations of the North British Railway Company in connection with the projected construction of a branch line from near Bonnybridge to Camelon Chemical Works. These operations, it was feared, threatened eventually to sweep away part of one of the best-preserved portions of the Antonine Wall still remaining, for while the proposed branch railway itself runs on the north side of the vallum, the line of deviation is so drawn as to include that specially interesting section at Tayavalla which was examined with so much pleasure by the members of the British Archæological Association in September last, it being thus evident that if the railway company extend their operations at this point on the south side of the wall, every vestige of this section of the rampart will be destroyed. The matter had been brought under the notice of Mr. Forbes of Callendar, who had communicated with the railway company, urging that if possible all injury to the wall should be avoided. It was agreed that a committee should be appointed for the purpose of representing to the North British Railway Company the importance of preserving from destruction so interesting a relic of the Roman occupation of Briton, and the extreme desirability of taking all possible measures to keep the line of deviation on the north side of the wall. The President afterwards exhibited an urn which was found by workmen digging a foundation at the head of the hill between the Rottenrow and George Street, a little west of the High Street. It was entirely dissimilar from any other urns he had seen, and he believed it to be of the Romano-British period, or even somewhat later. He also exhibited a stone hammer which was found at Greenhaugh, Huntly, and which, from its shape and finish, he inferred had been used as a weapon of war. Mr. T. Stout exhibited a

piece of wood found in Iceland, shaped like a spear-head, and which, for the purpose of hardening it, had apparently been impregnated with mineral water. He commented on the fact that although wooden weapons in plenty were found in the South Seas, this was the first indication that they might have been used by Scandinavians. Mr. A. C. Macintyre, F.S.A.Scot., afterwards read a paper on a ruined chapel at Dunswood, near Castle Cary; and Mr. Hugh C. Hamilton, a paper on the "Badges of the Highland Clans." Mr. Hamilton showed that floral badges were of very considerable antiquity, and remarked that it was pleasant to know that the two oldest badges of Scottish royalty were still displayed on the collar of the Order of the Thistle, which was formed of sixteen thistles alternating with as many bunches of rue sprigs. Mr. Macintyre and Mr. Hamilton received the thanks of the Society for their papers.

#### THE LATE RICHARD REDGRAVE, R.A.

THE Treasury Minute of August, 1875, by which a special retired allowance was awarded to Mr. Redgrave, gave the following statement of the services which he had rendered to the country:—

"The Lords of the Committee of Council on Education inform the Board (Treasury) that they transmit Mr. Redgrave's application for a pension with very great regret, but having once induced him to postpone his retirement, they feel that at his advanced age (71) they cannot properly urge him again to postpone his application for relief from the heavy labours which he has for many years discharged, with so much credit to himself and with such signal advantage to the State. They further inform the Board that to recount the services which Mr. Redgrave has rendered in the various offices which he has held would be to write the history of the Art Department under the various names it has borne from the date of its first establishment. They state that the present flourishing condition of the art division and the position which it holds, not only in this country but in the public opinion of the Continent, are the best testimony which can be given to the value of Mr. Redgrave's labours in founding and directing the existing system of art instruction throughout the United Kingdom, and in establishing and developing the art branches of the South Kensington Museum."

Colonel Donnelly relates another circumstance which does credit to the artist. Mr. Redgrave was pressed by Mr. Sheepshanks to accept the custodianship of his well-known collection of pictures, with a salary and residence in Rutland Gate; but with characteristic unselfishness he urged the step which Mr. Sheepshanks ultimately took, of presenting the whole collection to the South Kensington Museum.

#### A PROFESSIONAL MENU.

ACCORDING to Mr. Bryce, M.P., there is some hope for the Americans, since they are so largely endowed with the gift of humour, which never was more needed than at present. The following copy of the bill of fare which was used at the last dinner of the Arkansas Society of Engineers, Architects and Surveyors, will suggest the enterprise of the humourists in turning the most prosaic things to account:—

##### *Specification of a Banquet.*

*Foundation.*—The foundation shall consist of meats, laid as follows:—Roast turkey, well set in cranberry jelly, with ornamental belt courses of roast venison, broiled ham, and pickled ox tongue. The interstices to be well filled with chicken, shrimp, and potato salad.

*Water Table.*—Shall be of selected, well-dressed celery, English chow-chow, mixed pickles, French olives, Worcester-shire sauce and cold slaw.

*Superstructure.*—The superstructure to be of those ancient and substantial materials known as milk, rye, and light bread.

*Ornamentation.*—Ornamentation to consist of pyramids of meringue, pyramids of fruits, pyramids of wine jelly, ornamented angel food, and ornamented sunshine.

*Inside Finish.*—Inside finish to consist of pound cake, jelly tarts, egg kisses, almond and cocoanut macaroons, lady fingers, and almond spongelets.

*Plastering.*—Centre pieces to consist of oranges, bananas, apples, London layer raisins and Malaga grapes, to be well secured to ceilings and thoroughly fastened with Neapolitan ice cream, pine-apple sherbet, fruit and home-made candies, crackers and cheese.

*Hardware* will consist of the best-selected mixed nuts, each opening to be provided with a full set of nut picks.

*Painting.*—The whole to receive two flowing coats of French coffee, and as much water as may be necessary to make a good job.

*General.*—The whole to be under the immediate charge and supervision of Fred Rossner, architect to the Society.



**TESSERÆ.****The Turnerian Periods.**

J. RUSKIN.

THE works of Turner are broadly referable to four periods, during each of which the painter wrought with a different aim or with different powers. In the first period, 1800-1820, he laboured as a student, imitating successively the works of the various masters who excelled in the qualities he desired to attain himself. In his second period, 1820-1835, he worked on the principles which during his studentship he had discovered; imitating no one, but frequently endeavouring to do what the then accepted theories of art required of all artists—namely, to produce beautiful compositions or ideals, instead of transcripts of natural fact. In his third period, 1835-1845, his own strong instincts conquered the theories of art altogether. He thought little of "ideals," but reproduced, as far as he could, the simple impressions he received from Nature, associating them with his own deepest feelings. In 1845 his health gave way, and his mind and sight partially failed. The pictures painted in the last five years of his life are of wholly inferior value. He died in 1851.

**Encaustic Painting.**

S. FISHER.

The surface, whether of plaster or stone, to be painted on is heated by means of a portable charcoal fire till one can scarcely bear the hand upon it. A greater heat will not have the effect of causing the solution to penetrate any further than a moderate one; about one-sixteenth of an inch is the utmost depth to which a common red tile will absorb it, when made nearly red-hot. It is then to be thoroughly saturated with a mixture of about two parts of white wax and one of gum damar, dissolved in turpentine, which is the medium to be used throughout the work. The addition of gum to the wax is necessary, as, alone, the wax would be too soft to work upon pleasantly, but any increase in this quantity of gum has a tendency to crack when the colours are laid on in any body. The employment of gum copal, or elemi, as being harder gums than damar, is preferred by some. Mr. Gambier Parry's medium is of this kind; but as he omits altogether from his formula the agency of heat, either to combine the finished work with the under-coats, or for the preparation of the wax, and also lessens the quantity of wax, his is not an encaustic process. These harder resins are more difficult to deal with, they require a stronger solvent than turpentine, or that a little oil should be added to the composition, which it is most important—on account of its tendency to darken—to do without; when used they are no more impervious to damp than damar, and that they should be less soluble in turpentine simply is a very doubtful advantage. When the wall is sufficiently cold, the ground colour may be laid on in the usual way; but, if more than one coat is necessary, it is essential that the first is left sufficiently long to become hard before putting on the next. The only difficulty of manipulation attendant on encaustic painting is the tendency of the upper coats to penetrate those beneath, but a little dexterity in handling will obviate this. Upon this ground the subject is to be painted, with colours ground in the same preparation of wax and resin, and thinned to an agreeable consistency with turpentine. The work may be added to or altered with all the facility of oil colours, and, when the whole is completed, it is to be reheated regularly and slowly by means of the brazier. It is sometimes the practice, before this final heating, to varnish the whole surface with the wax medium; but if the wall, before commencing, has been thoroughly saturated, and a sufficiency of it has been used with the colours in working, this will not be found necessary. The result of this burning in is, that the finished painting, the ground, and the preparation of the wall, are all melted and amalgamated together in one homogeneous substance, united to the wall in the most perfect manner, and remaining brilliant and imperishable.

**Gothic Buttresses.**

S. HUGGINS.

Of all the features of a Gothic pile, the one that most loudly calls for the refining influence of the Classical style is the buttress. In the great Mediæval examples of this feature it is considered a merit that it is of the form best calculated for successfully resisting the lateral thrust of the groined vaults; that it is formed and disposed in strict and literal obedience to the law of the resolution of forces, and, therefore, without waste of its materials, every particle of which is actively employed to the exclusion of any useless or expletive masonry from its composition. Now, it appears to me that it is only in the comparatively prosaic works of the engineer, and not in every work of even that class of production, that strict economy of materials should be enjoined, and that a buttress or anything else fashioned with an eye to a material use only and to the embodying of proof of dynamical and statical

knowledge and skill, does not belong to architecture, which, as an art of the beautiful, requires a greater sacrifice to the sense of beauty than is involved in the mere carved adornment of the form arrived at by algebraic calculation. I cannot but think the form itself should be modified by careful considerations with regard to beauty, a ray of which, says Emerson, outweighs all the utilities in the world, and be made as beautiful as would consist with its fully and clearly expressing its office and purpose as a buttress. While the law of forces should be kept fully and clearly in view, such addition of material beyond what stability required should, I conceive, be made as would enable the architect to mould it into the greatest symmetry and grace of which it was susceptible, and enable him, in carrying it up from the ground, to avoid those irregularities which so frequently disfigure it, such as the one-sided set-offs, which are far less pleasing than the slope, which is carried equally round the three sides, and less susceptible of effective and satisfactory decoration. The Mediæval architects did generally go so far as to give the buttress less projection than the outward thrust of the vault required, and supplied the deficiency of lateral resistance by the perpendicular pressure of the pinnacle. This was done less for appearance, perhaps, than to prevent an inconvenient projection of the buttress; but might not a further liberty be taken with it to make it more symmetrical and graceful, and consequently more a feature of fine art? Might we not further reduce the necessity for projection by giving it greater thickness or width, or by giving additional thickness to the wall. But there are examples to show that the buttress can be sufficiently lightened as it ascends, and with entire geometrical regularity, with but little sacrifice of material. There are, I doubt not, various ways of doing it; among the rest, that of turning the upper stage diagonally, which gives it a piquant and pleasing effect. But whether much or little expletive matter be required for the purpose in question, as beauty is indispensable in architecture, we should be quite justified in giving it so much as is allowed in oratory for the sake of sound, and to satisfy the sense of hearing, in adding synonymous and unnecessary words to complete the roundness of a period.

**Gothic Pinnacles.**

A. W. PUGIN.

I have little doubt that pinnacles are considered by the majority of persons as mere ornamental excrescences, introduced solely for picturesque effect. The very reverse of this is the case, and I shall be able to show you that their introduction is warranted by the soundest principles of construction and design. They should be regarded as answering a double intention, both mystical and natural. Their mystical intention is, like other vertical lines and terminations in Christian architecture, to represent an emblem of the Resurrection. Their natural intention is that of an upper weathering to throw off rain. This most useful covering for this purpose is of the spiral form: only let such a form be decorated with a finial and crockets, and we have at once a perfect pinnacle. Now the square piers, of which these floriated tops form the terminations, are all erected to answer a useful purpose when they arise from the tops of wall-buttresses.

**The Lighting of Temples.**

E. M. BARRY.

The question of lighting temples is one of great interest and on which there has been much diversity of opinion. Some have thought that the external light was admitted, and that artificial lights were used for greater solemnity only, as we see at the present day in shrines of great reputed sanctity in the East and in some Roman Catholic churches. Others have suggested that there was a large opening in the centre of the roof admitting light and air as by a skylight. It is easy, however, to see that such a plan would render it difficult to avoid external disfigurement, while it would also fail to protect the interior from rain and snow. Mr. Fergusson has propounded a third theory, namely, that of a clerestory, with openings in the roof to allow light to pass through it. The Egyptian custom is in favour of this suggestion, for in many of their temples—as, for example, at Karnak—such a plan of lighting is adopted, and with a very striking effect. That the Greeks were acquainted with Egyptian work there can be no doubt, and as they transferred the rights of Isis to their own soil, there is no great difficulty in supposing that they may have also borrowed some architectural ideas from the banks of the Nile. It may, perhaps, be objected to the plan proposed that it is not quite consistent with the simplicity of the form of the roof, which would not readily suggest any complication of internal arrangements. There would also be some difficulty with gutters to carry off the water, and no evidence has as yet been discovered to show how this was effected. The temples of the Romans were used sometimes as places of assembly, and there is, therefore, in their case a strong presumption in favour of their having been arranged to receive direct light and air; but I do not think this applies at all with equal force to Greek work. If we consider the small dimen-



sions of the cellæ of Greek temples, there is no great difficulty, as it seems to me, in supposing that they depended chiefly on artificial modes of lighting. They were shrines for the safe custody of sacred statues of the gods, not places in which crowds could assemble, and any openings of the roof would have affected injuriously their protective qualities. The doors being thrown open would also admit a greater amount of light and air in a climate like that of Greece than we can readily imagine in our land of fogs. The simplicity of Greek principles of design must also be insisted on as a difficulty in the way of any suggestion that they employed elaborate contrivances. If they required light in their temples the obvious course would have been to place windows in their walls, and this is precisely what was done at the Erechtheum and also at Agriguntum. May it not well be the case that custom varied, and that some temples were constructed without that external provision for light and air which was thought necessary for others? At the Erechtheum the latter was doubtless the case, and the architect placed windows in the walls. May we not conclude that if they had been needed at the Parthenon they would have been supplied in a similar manner? The chief beauty of the Parthenon was the exterior, and it would scarcely be possible to arrange any openings in the roof which would not be more or less of a blot on its fair proportions.

#### Elizabethan Architecture.

W. H. LEEDS.

That the Elizabethan style possesses historical interest I do not dispute, but that it offers any beauties or advantages to recommend it as a mode of architecture is what I must be allowed most flatly to deny. Its only principle is the disregard of all architectural principles, and of all artistic feeling. Very seldom do we meet with anything in it that can be termed really good, even estimated according to what may be considered the leading taste of the examples themselves; or if there happen to be some particular feature that satisfies the eye, it is a mere solitary bit in the composition—although it is rather an abuse of term so to employ it—without anything to harmonise with it. Besides which, notwithstanding their licentiousness of design, the examples of this style betray great dearth of ideas and poverty of imagination; for, be it observed, there is a most wide difference between whimsies and fancies and fancy itself. I have met with some people who, in aiming at being amusingly lively, have only been impertinently frisky, nor is it a small degree of awkward friskiness that characterises the style in question, and causes it to appear even more dull than it else might. It is no more than right that we should know what it really was; but its examples ought to be held *in terrorem*, certainly not for imitation, except it be that species of imitation which enables an artist to appropriate what is available for better purposes, rejecting all the dross. Yet those who have of late served up this style to us have generally taken care to give us garbage and all. Certainly no one has hitherto attempted to discriminate between its best and worst qualities, or to point out what it offers for adaptation to our present purposes; since, leaving taste entirely out of the question, it has nothing whatever to recommend it as a mode of building adapted to our present habits and tastes, certainly nothing on the score of comfort and convenience, on that of economy perhaps even less, since it is only lavish profusion of decoration that can conceal its native ugliness. I may be told that it is a truly national style, that of our ancestors; national nonsense! So were trunk-hose and cumbersome ruffs at one time our national dress, yet what man—I do not say of sense, but in his senses—would wear them now, unless determined to establish for himself, at all hazards, a character for singularity? We do nothing else like our ancestors; then why, in the name of common sense, should we put ourselves into their most grotesque and unseemly architectural fashions?

#### Subways in Towns.

M. O. TARBOTTON.

The advantage of subways (if safe for gas-pipes) is universally admitted, and their most earnest opponents have failed to show any case against them for water, telegraph, and similar purposes (*vide* Minutes of the Select Committee, June 1864); but in respect of gas-mains there undoubtedly is possible danger (as in every place to which gas is conducted), unless sufficient means of ventilation are provided, and the best modes employed in making and continuing the joints of mains and service-pipes. I entirely believe in the statement of Mr. Hawkesley, that in a well-managed company the escape from the main is very slight indeed (say from 2½ per cent. to 5 per cent.); but I venture to contend that in a well-regulated subway, escape from the mains, to become dangerous, need not take place at all, for the following reasons:—1. That they are not subjected to the perpetual vibration caused by street traffic (in a subway there is no vibration). 2. That they are not constantly disturbed by excavations around and under them for services and drainage operations. 3. That they are under

regular inspection, and the joints can be recaulked when necessary, or bitumenised or varnished from time to time. 4. That oxidation would be less rapid. Furthermore, if an insidious escape of gas happened, an ordinary ventilation would prevent serious consequences. The wrought-iron services are the greatest promoters of leakage; and during a daily experience of underground works for years I have scarcely ever found a perfect service-pipe which was not new, or nearly so. The lime of the pavement concrete and the damp of the soil destroy the pipe, and the traffic loosens the joints. Now, this may be prevented by using lead services; but in a subway the destructive influences mentioned would not operate to anything like the same extent with wrought-iron, and renewal would be readily accomplished. It has been stated that under the present system escaped gas is absorbed by the soil, and that soil forms the best cushion on which to lay the pipes. If this be the opinion of gas companies, the subway plan offers no impediment, as on the side of the subway intended for gas-mains the same may be imbedded to any required extent; in fact, this is already the case in Covent Garden subway. Leakage by endomose action has been advanced, but if gas companies prove all their pipes, as they profess to do, the pressure employed in gas-mains will altogether be insensible. It is true, if a large pipe be accidentally broken, the same damage might arise as if the casualty occurred in a street or any other place; but if large operations were in progress in the subway, corresponding precautions would (and could most easily) be taken to meet the contingency of accident; and it is only reasonable to expect that in a large system of subways the control and management thereof would be in the hands of a single and responsible authority. It is the interest and duty of corporations and other bodies having the charge of the highways and streets of large towns to prevent as much as possible their constant ravishment; and if the subways now proposed will effect this object without detriment to the companies, they ought to be compelled by the Legislature to adopt them.

#### Classic and Gothic Columns.

G. G. SCOTT.

In no feature is the difference between Classic and Gothic architecture so strongly marked as in the column. In the former one general ideal alone prevailed—the round shaft with a capital, and with or without a base. In the latter this normal type is equally admissible and equally honoured, but in addition to it an almost endless list of forms are introduced. In the first place the round column is converted at pleasure into the octagonal or other polygonal form—this is a mere variety of the normal type; then either the round or the polygon is flanked by four smaller shafts, attached or detached, and these subsidiary shafts may be increased in number, subordinated one to another both in size and salience, and may be all attached, all detached, or the attached and detached shafts may be used alternately, or in any other order in the same pillar. Then, again, instead of the cylindrical pillar, we may have four cylinders united in one, and these may in their turn be made the nucleus round which detached or attached shafts may be grouped; or we may have two or more separate cylindrical main shafts carrying the load, and may group subordinate ones round them; and again we may take other forms of nucleus, as the square, the canted square, or a pier with receding orders, and place our shafts round them; and finally we may form groups in which no specific form of nucleus is to be traced, but which consist of shafts arranged with reference to the superincumbent arch alone. The number of changes which may be rung on these varieties of pillar are absolutely endless, though it is not desirable to indulge too much in the more intricate forms of grouping; but, as a general rule, to keep to forms which are naturally suggested by the duties the pillar is designed to perform. When detached subsidiary shafts are used it is somewhat unnatural to joint them in their length without introducing some visible means of tying them to the main pillar within. This necessity gave rise to the use of the moulded band, which forms so beautiful a feature in the pillars of this period. It is sometimes made of brass, but more usually in stone or marble. The bases of columns throughout the Romanesque period were most usually founded on some traditional variety of the attic base. The resemblance is often obscure, but in many cases very close. Towards the end of the Romanesque period very great attention began to be paid to the sections of base mouldings, and in Transitional works they are often more beautiful than at any other period. The difference between these bases and the ordinary Attic base is of the same kind which distinguishes Greek from Roman moulding. It is an extreme delicacy of curve, the substitution of elliptical section for circular, and a wonderfully studious grouping of the hollows, rounds, and arrises, so as to produce a refined and delicate contrast and gradation of light and shade.

The Death is announced of Mr. John Brockbank, City surveyor of Norwich.



## NOTES AND COMMENTS.

AN account of the lake dwellings discovered in Holderness, between Hull and Bridlington, was read by Mr. J. W. DAVIS at the annual meeting of the Yorkshire Geological and Polytechnic Society. He said they appeared to be the most ancient in the British Isles. In digging beneath the platforms, mixed with the natural accumulation of peat there were found large numbers of the bones of animals which had been used as food, charred wood from the fires, implements of stone, rounded stones for pounding and grinding corn, arrow and spear heads, rudely-fashioned objects of bone used for fastening skins round the loins or for personal adornment, and other relics. The excavations were undertaken by the Society, but some help had been given from the funds of the British Association. Indeed, the Yorkshire Geological and Polytechnic Society were pioneers in that sort of exploration, as the attention of the members was turned to tumuli, caves, entrenchments, and other phenomena connected with prehistoric inquiries, at a time when those studies were much less common than at the present day.

WE have often remarked upon the license of the bill-stickers of Paris, who have not the least regard for public buildings or monuments. The police and the higher officials have allowed white and coloured bills to be pasted against new and ancient buildings. The only action is, when the layers of paste and paper become over-thick, to remove them, and thus to make way for a new series. Sometimes after the posters are removed stains of colour remain, which no rain can wash away. The proper course would be to put up a label prohibiting the degradation of buildings, and if offenders were caught, to inflict a salutary punishment upon them. But the authorities act as if the bill-stickers were possessed of immemorial rights. One effort we must admit has just been made to save the Louvre, which has especial attraction for the bill-stickers. Framed wooden panels are placed on the walls for the reception of placards, and it is announced that a penalty will be inflicted on all who stick bills on the masonry. But if a regulation of that kind can be carried out, it is possible also to preserve the buildings from unframed posters, and if so, why has the evil existed for so long a period?

THE subsidences in Northwich and other parts of the salt district have caused not only excitement but serious loss. A meeting was held last week for the purpose of petitioning Parliament to appoint a royal commission to inquire into the subject, when an announcement was made which will give more satisfaction than the prospect of unlimited blue books. Mr. JOSEPH VERDIN, who is known throughout the district for his generosity, has made a gift of two hundred paid-up shares in the Salt Union, Limited, of which the market value is about 28,000*l.* at present, with the intention that the income derived from them shall be applied to compensate people who have suffered through subsidences caused by the pumping of brine. It is to be hoped the subsidences will not go on in perpetuity, but if they cease it will not be difficult to discover many ways to expend the money for the benefit of the district. A memorial for a royal commission was adopted at the meeting.

THE difficulty of blasting rock in the neighbourhood of a town is suggested by a case which has arisen in Dundee. Messrs. YOUNG & Co., of Glasgow, are the contractors for the Fairmuir branch of the Caledonian Railway, which is in progress, and it was necessary to blast rock in order to form the line. In all cases of the kind, people in the neighbourhood become easily alarmed, and it was not surprising that the owners of some workshops applied for an interdict to prohibit the blasting. The Sheriff granted that document, but, as he says, he did not mean an entire stoppage of the rock-cutting. But of course the interpretation put on it was that it was prohibitory. The result was that the works could not be continued, and the navvies would be turned adrift. An application was made to the Sheriff, and it is creditable to relate that he has recalled the obnoxious interdict. The Sheriff maintains that

what he did originally was to prevent the projection of stones and missiles into the workshops of the plaintiffs. "I did not intend," he said, "to stop the use of gunpowder or of any other explosives. I did not intend to stop the defenders' whole rock-cutting operations. All that I intended to prohibit was the reckless carrying on of these operations, and in particular the firing of charges of gunpowder or other explosives without the use of such 'blinding' by brushwood, chains, rope network, wooden plank-ing, or such other protective obstruction as would prevent the stones from flying into the pursuers' property or elsewhere to the risk of property or of life." The Sheriff admits that the depriving men of their employment would be a more certain and irretrievable injury than any that the interdict could prevent. The contractors are not to be blamed if they took the words of the interdict literally. They knew they were liable for damages if they caused injury, but damages *plus* penalties for not carrying out a contract in time is worse than Jedburgh justice.

WHEN the English chapel in the Rue Marbœuf, turning out of the Champs Elysées, was removed about seven years back, in consequence of the street improvements of the district, it was supposed by some of the worshippers that a different cause was at work, and they were not solaced by the price that was given for the building. The new church which is a substitute for it is erected in the Rue des Bassins, near the Arc de l'Etoile, and where once the reservoirs for supplying the fire-engines were to be found. The building is larger and the site is more costly than before, but thanks to Sir RICHARD WALLACE's donation of 10,000*l.*, the financial difficulties were overcome.

ACCORDING to what was said, at the meeting of the Finance Committee, by Sir POLYDOR DE KEYSER, the executive president of the British Section of the Paris Exhibition, the machinery that will appear will not form as impressive a sight as was anticipated. We suppose engineers are weary of exposing their inventions and improvements before people who are more eager to imitate than to purchase. The machinery hall is 1,500 feet long, 374 feet wide, and 160 feet high. Sir POLYDOR called attention to the work which Mr. HUNTER DONALDSON is doing in connection with the decoration. One of the features noted was the great screen which will impart character to the section.

THE sum of two and a half millions of francs has been voted by the Municipal Council for the decoration of the new Hôtel de Ville, Paris. We have already described how the work was allotted, and there are few painters who could claim to have gained a position that would qualify them for the task who have not been gratified with a large or small commission. When completed, the Hôtel de Ville will exemplify the state of French painting in our time. The variety of styles will be remarkable, and it will be found sometimes in one room if not on one wall. Objections were raised against the division of the commissions on that account, but unless the work was given to one artist it is not easy to make out another way to insure unity. The munificence of the Municipal Council is without parallel, and the assignment of the spaces was conducted without any suspicion of unfairness.

WHITAKER'S Almanack has attained its majority, and after so remarkable a youth it would be hard to say what cannot be accomplished by so excellent a servant of the public. Already we possess in the Almanack a book of reference, both wide and varied in range and of unquestioned accuracy. It will generally be acknowledged that information which is sought in vain in larger and more expensive works is to be found in "Whittaker." There is only one short-coming in it, and that is the absence of any recognition of what artists are doing. A review of the year's work in architecture and the subsidiary arts would be a welcome addition to the pages, especially as the dull catalogue of the Stationers' Almanack would not be likely to be imitated. Even without its chapter on art the Almanack is a shilling's-worth which high and low, young and old, should possess.







The Architect, Dec<sup>r</sup> 28<sup>th</sup> 1888.



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WESLEYAN CHAPEL, HORBURY JUNCTION.

WALTER HANSTOCK, A.R.I.B.A. Architect, BATLEY.







The Architect.



CHÂTEAU,  
by JOHN S.  
From the Drawing below



Oct 28<sup>th</sup> 1888.



NO PHOTO SPRING & KIL 23 VANT N. LIND. PHOTO. N. D.

VERMANDY.  
COTMAN  
to James Reeve Esq







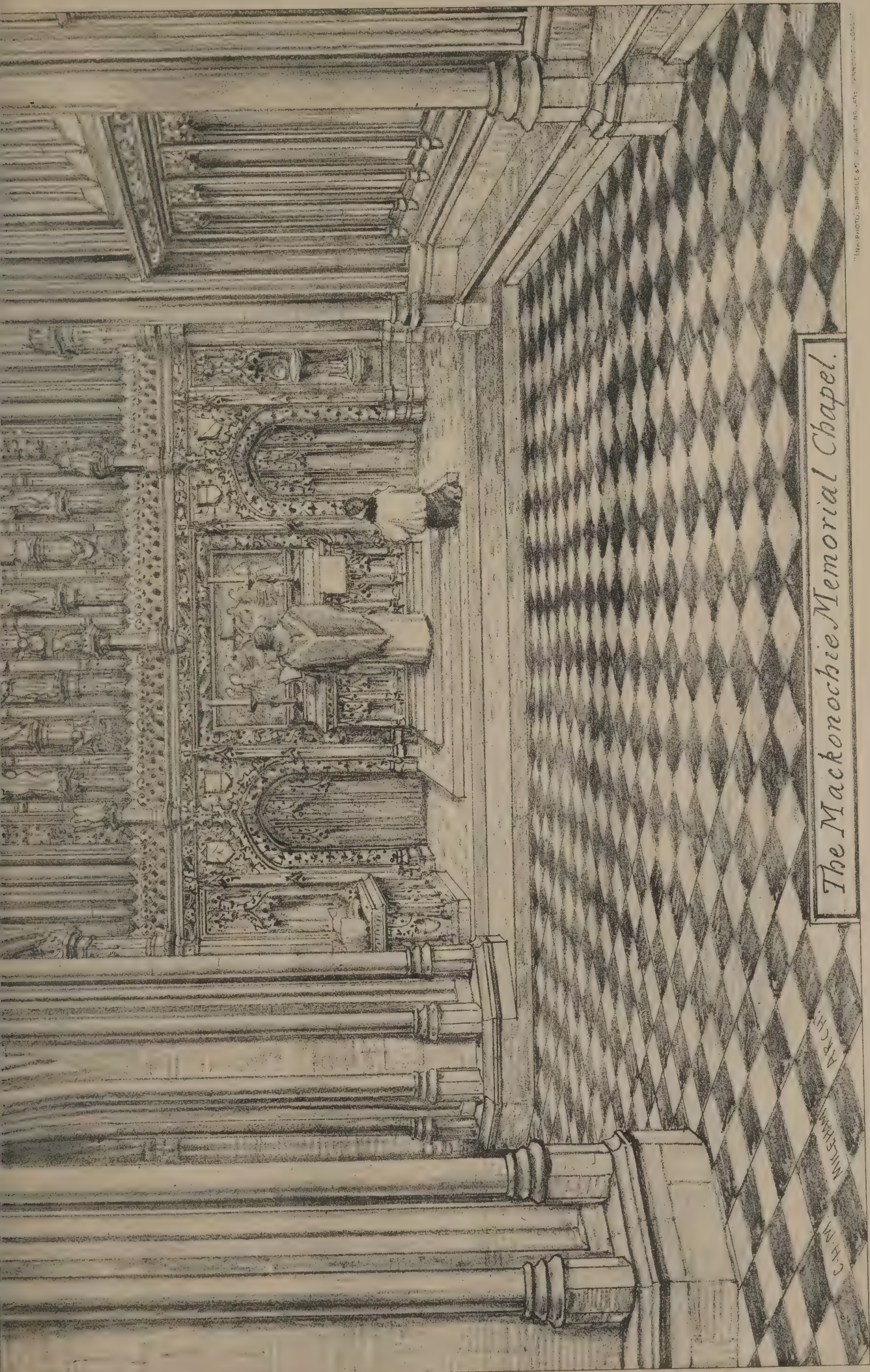




Die Architect. Dec. 28. 1888.







*The Mackonochie Memorial Chapel.*

THE MACKONOCHE MEMORIAL CHAPEL, S. ALBAN'S, HOLBORN.  
C. H. M. MILEHAM, Architect









Printed by Sprague & Co. 2, Market Lane, London, E.C.

NEW BAPTIST CHAPEL, NORTHCOTE ROAD, BATTERSEA.

E.W. MOUNTFORD, A.R.I.B.A. Architect







## ILLUSTRATIONS.

CHATEAU, NORMANDY.

ARCHITECTURAL ILLUSTRATION SOCIETY.  
SECOND SERIES.NO. 51.—MACKONOCHE MEMORIAL CHAPEL, ST. ALBAN'S, HOLBORN.  
[C. H. M. MILEHAM.]

WESLEYAN CHAPEL, HORBURY JUNCTION.

THE above chapel has now been completed about six months. The buildings comprise:—Chapel to seat 200 adults, with small gallery over entrance end for 70 children; organ-chamber, band-room, vestry, heating vault, and front and back entrance, lobbies, stairs, &c., complete. The total cost of the buildings (excluding cost of land and architect's commission) is 1,141*l*. The chapel is situated at Horbury Junction, a small village near Wakefield, and stands upon a good site at the junction of the two main roads. The external walls are 20 inches thick, and are faced with the best Delph wallstones, pitch faced on front elevation, and remainder chopped. The ashlar dressings for the front are of the best white rock from the Holmfirth Quarries, the remainder of ashlar being from a local quarry. The joiners' work is of the best pitch pine varnished, and the roof is constructed on the hammer-beam principle. The windows are all leaden-lights, slightly tinted, with ornamental bosses, &c., in tracery. The plastering is all three-coat work. The slating is of the best quality blue Bangor slates, with dressed stone ridging. The chapel is heated with hot-water piping on the "low-pressure" system. The ventilation and acoustic properties of the building have been carefully considered. The masons' work throughout is an exceptionally good job, and deserves special mention, the builder being Mr. JOHN WAINWRIGHT, of Horbury. The stone carving has been very artistically executed by Mr. J. P. STEELE, of Bristol. The whole of the works have been designed by, and carried out under the superintendence of, Mr. WALTER HANSTOCK, A.R.I.B.A., architect, Batley.

NEW BAPTIST CHAPEL, NORTHCOTE ROAD, BATTERSEA.

THIS building has been recently completed from the designs of Mr. E. W. MOUNTFORD, A.R.I.B.A., of 22 Buckingham Street, Strand, the works being very satisfactorily carried out by Mr. WILLIAM JOHNSON, of Belle Vue Road, Wandsworth Common. The walls are of red brick, supplied by Messrs. RICHARDSON, of Brunswick Wharf, Vauxhall, the roofs being covered externally with "Permanent Green" slates. GREGORY'S wood-block flooring is used. In the chapel seats are provided for nearly 800 people, all of whom have an unobstructed view of the minister. Beneath the chapel is a lecture-hall for 300, infants' and several other classrooms, and kitchen. In a rear annexe are vestries for minister, deacons, and stewards. Separate vestries for men and ladies are also provided. The ceiling of chapel is executed in fibrous plaster by Messrs. JACKSON & SON; the heating arrangements by Messrs. J. L. BACON & Co.; and the gasfittings and other ironwork by Messrs. VAUGHAN & BROWN. The clerk of works was Mr. WILKINSON. The total cost has been 5,400*l*.

In the description last week of the Yorkshire Penny Bank it was mentioned that the lights were supplied by Messrs. HEYWOOD & Co. It should have been Messrs. HAYWARD BROTHERS & ECKSTEIN, of Union Street, Borough.

## BROWN STUDIES.

A REPRESENTATIVE of the *Sunday Times* has succeeded in forcing Mr. Labouchere, M.P., to undergo the ordeal of an interview. The member for Northampton has already made a name in diplomacy, finance, literature, the drama, &c., but according to his own account he is contemplating a revolution in Art. The scheme may be only one of Mr. Labouchere's jokes, but it is worth recording. The reporter relates how, after explaining some political questions, Mr. Labouchere said very gravely to him:—

"There is one thing which I should like you to write in your account of this interview, and that is to disclose a fact which is not yet known to the world. It is for you to communicate to the public that I am the High Priest of Art! I have always had an idea that all other preachers on aesthetics, from Whistler to Ruskin, have laboured in darkness, and that they will not see the light until I lift the veil of mystery which enshrouds Art. After long thought I have evolved entirely new principles, and for my *début* in the realm of Art I intend to devote my energies towards the elucidation of the art of house decoration. In this house I have not been allowed to say a word as to the adornment of it, as from the 'best parlour' overhead to the garrets, and from the dining-room to the basement, Mrs. Labouchere has had full sway, and, like the prophets of old, I am laughed at and gibe at, and bidden to stand aside whenever I venture to air my Art principles."

I may here remark, says the reporter, that the spacious apartment alluded to as the "best parlour" is a marvel of comfort and elegance, and the harmony of colour displayed by the blending together of priceless paintings, old china, silken hangings, Oriental couches, luxurious modern chairs, delicate marble statuary, favourite pictures on easels, rich carpets, and what not, bear tribute to Mrs. Labouchere's artistic skill and taste, which, indeed, is apparent throughout this beautiful home. Nevertheless, the High Priest of Art has other ideas, for he went on to say, "It is usual for most people, if a room be dark, to lighten it by means of pale decorations; or, if the room be light, to subdue it by all that is dark in the matter of heavy-toned paper and hangings. Now, all this is wrong. Put light to light, and dark to dark, and the effect will be pure Art, as well as affording in one house a complete change. When tired of a light room you can repair to a dark, or *vice versa*. The great thing, however, is to have a scale of rooms for real comfort, and gently tone them, from blinding light apartments down to those of pitchy darkness; but take great care never to mix colours throughout the house. Have one colour, and play upon the different shades of it. Now, my mania is brown, and I have bought a nice old mansion in Westminster, which I intend to decorate entirely after my new principle, and all in it will be brown. My friend, Mr. Claude Ponsonby, who has a beautiful eye for colour, has promised to ransack Paris for every new variety of fabrics, wall-papers, carved woods, and pictures—all in brown—and will send them over in shiploads to Westminster Bridge. Those materials in hand I shall work in my new house, and be at home there all hours, when not engaged at the House of Commons, to initiate any visitors who wish to become followers of my new Art principles. The only stipulation is that they come arrayed in brown."

Further inquiries into this wonderful scheme elicited from Mr. Labouchere the fact that he is at present deep in consultation with builders, decorators, and workpeople about his new house. It is to be hoped that the great High Priest of Art will not be done brown himself.

## STANDARDS OF LIGHT.\*

THE great importance attaching to the measurement of light in these days of severe competition between various luminous agents, renders it imperative that the question should be kept well in view, to prevent its being lost in the whirlpool of political changes. To many of the public the question doubtless appears to be one of those with which scientific men like to amuse themselves, but which can by no possibility have any effect on the practical details of our daily life. To show the immense commercial importance of the question in this city of London alone, it is only necessary to put forward the facts relating to the gas supplied by the three large companies, viz., the Gas Light and Coke Company, the South Metropolitan Gas Company, and the Commercial Gas Company. In 1887 the amount paid by the public to these three companies for gas was 3,354,794*l*. Practically the whole of this amount was for 16-candle gas, therefore 209,674*l*. was paid by the public of London for one candle of light. When this item is added to the whole of the gas supply of the United Kingdom, it will be at once comprehended that in this seeming unimportant controversy we have one of the most far-reaching questions of the day; one in fact which, as soon as it is fairly grasped by the public, will have to be speedily settled. Up to the present it may be said that, in spite of the repeated inquiries, reports, papers before the various societies, and long correspondence in the newspapers, the question is still looked upon as merely pertaining to the laboratory of the professional photometrist.

The keen competition between the gas companies and the electricians, which is but beginning to rear its head, and promises to soon become a serious matter, demands a settlement of the value of our English unit, the sperm candle, and the provision of a substitute for it which will at once be reliable

\* From a paper by Mr. W. J. Dibdin, F.I.C., F.C.S., read before the Society of Arts.



in working and capable of multiplication and repetition to an unlimited extent. Looking beyond our own nation, we see the question agitating the minds of conscientious workers in other countries. In France the "Carcel" lamp has held its own since its introduction in 1800, much in the same way as our sperm candles still maintain their pre-eminence here. In Germany the paraffin candle (used, however, in a far more scientific way than are our sperm candles) still holds the field. In America, in this matter, they try all things, and anxiously watch the older countries for guidance.

When gas was unknown, and oil lamps and tallow candles ruled the roast, and the electric light was yet unborn, Bouguer, in 1760, proposed candles as the unit of comparison. In those days there were no official testing stations, and no boards of directors to harass unhappy gas managers. Had Bouguer lived now, it is open to doubt whether he would have been bold enough to have made the same proposition. Sixty-four years later Ritchie proposed wax candles, but does not appear to have worried himself about the rate of consumption. Tallow, paraffin, stearine, and sperm have been all tried, and finally in this country sperm candles, weighing six to the pound, each candle burning 120 grains of sperm per hour, were adopted.

The contradictory results afforded by the various candles and the Carcel lamp gave rise to numerous proposals for substitutes. Amongst these are the four-wick lamp of Potter; Keates's sperm oil lamp; Bunsen and Roscoe's carbonic oxide flame; Crookes's alcohol and benzol flame; Von Wartha's ether flame; Vernon Harcourt's pentane air-gas flame and lamps; Fiddes aperture, Wolf's screened moderator lamp; Hefner-Altenack amyl-acetate flame; Methven's screened Argand flame; Edgerton's screened petroleum reading lamp; Rüdorff's screened Argand flame; Sugg's 10- and 16-candle tests (screened Argands); Dibdin's pentane Argand; Draper's, Zöllner's, Schwendler's, and Violle's incandescent platinum and silver units, and various electric incandescent lamps. For the purpose of ascertaining the quality of ordinary coal gas various devices have been employed, such as the length of a gas flame at known pressures, i.e., "jet" photometers, but these cannot be classed under the head of "Standards of Light."

By a process of the survival of the fittest, only the pentane, the Methven screen, the pentane Argand, and the 10- and 16-candle tests, are now before the public as practical proposals for substitutes for the sperm candle in this country. In Germany the amyl-acetate lamp of Herr von Hefner-Altenack has met with great favour, and it would appear to have a good chance of being adopted as the legal standard. The objection of the English experts to the colour of the flame is so strong, that there does not appear to be any probability of its being adopted here. In France the melted platinum unit, in the form proposed by M. Violle, has met with some favour, but nothing practical has arisen from it up to the present. I tried a modification of this proposal in connection with my experiments conducted under the direction of the Metropolitan Board of Works, in which I melted platinum foil by the oxyhydrogen blow-pipe flame, and took the light emitted at the moment of its melting as the indicator. This system was followed up by the Standards of Light Committee of the British Association, and elaborated by Mr. H. Trueman Wood, the secretary of this society, who arranged the foil so that it could be melted by an electric current. The British Association Committee also tried a suggestion of Professor Dewar, which provided for the end of a thick rod of platinum being kept in a molten condition by the oxyhydrogen flame, and, while in that condition, being used as a standard after the manner of the Methven, a screen with a small circular aperture being placed immediately in front of the molten bead of platinum. None of these methods, however, gave reliable results, and there does not appear to be much hope of such a standard ever finding favour in this country.

The Standards of Light Committee of the British Association for the Advancement of Science reported this year that, in their opinion, Professor Violle's molten platinum standard is not a practical standard of light, although they were quite prepared to agree to the adoption of the light emitted by a square centimetre of molten platinum as a unit, but not as a standard of light.

Having arrived at the conclusion that the present legal standard is unreliable, it is necessary to inquire into the merits of the various proposed substitutes. Of these the pentane air-gas standard of Mr. A. Vernon Harcourt undoubtedly holds the highest rank. This was first introduced in August, 1877, when Mr. Harcourt read a paper upon it before the Physical and Chemical Sections of the British Association, at their meeting held at Plymouth. On April 8, 1879, Mr. Harcourt forwarded to the Board of Trade a letter accompanied by a statement of a series of tests made with the candles and the new standard. In consequence of this communication the Board of Trade appointed the committee to which I have already referred, who, after a very careful examination, reported that, "Compared with the sperm candle, Mr. Harcourt's air-gas flame is exact and trustworthy as a standard of light."

The conclusions as to the fitness of the pentane air-gas as a desirable unit, arrived at by the Board of Trade Committee in 1887, and by myself in 1885 and 1887, have since been confirmed by the Standards of Light Committee of the British Association, who this year recommended its adoption.

Having now arrived at the point at which candles are shown to be untrustworthy, and a suitable substitute found in the pentane air-gas flame, aided, for practical purposes, by the pentane Argand, it may be of interest to glance at the position of the question on the Continent. In presenting a Report of the Committee on Candles to the twenty-eighth annual general meeting of the German Gas and Water Society, in September last, Dr. Krüss stated that the committee thought to have fulfilled their instructions by establishing the German Society's paraffin candle, which had for the last year been manufactured under the society's direction at the works in Waldau; and that the society had determined no longer to issue six to the pound but ten, in order to obtain a length of candle more suitable for practical use. Each single candle was provided with a wick in perfectly central position, which is more easily accomplished in the shorter candle than in the long one. Care had been taken that the new candles have exactly the same photometrical value as the former ones. While the work of the committee had been devoted to the control of the production of the standard candles, and to supplying these to the consumers, they had occupied themselves with the amyl-acetate lamp, and had already come to the conclusion that it was an extremely comfortable standard for every-day use. This decision had been subsequently confirmed. From the results of a number of tests made by the members of the society generally, it was agreed that for daily use for the present there was no better, more practical and comfortable, and less time-consuming means for light measuring. It appeared, however, that the proportion of the intensity of the lamp to the different candles had not been accurately determined. The intensity of the German Society's candle was variously stated to be 1.2, 1.234, 1.21, 1.26, 1.12, and 1.20 amyl-acetate lamps with 40 mm. height of the flame. Still greater differences had been found when comparing the English candle with the lamp. It was evident that further close and continuously systematic trials were necessary to determine its exact value. From a series of experiments conducted by Dr. Liebenthal, of Hamburg, it appeared that the measurements of the wick tube, and consequently the diameter and length of the wick, need not be adjusted with extreme accuracy, but that the height of the flame was very important, and that the mean variations between two amyl-acetate lamps come within one per cent. The committee had therefore resolved, in conformity with the experience up to the present, that the steadiness and easy application of the amyl-acetate lamp, even in its present form, recommends it as a suitable means of comparison for light measurements, and that further trials are necessary to determine the proportion between the intensity of the amyl-acetate lamp and that of the candle. It was therefore proposed to constitute the Committee on Candles, a committee on light measurements to make these trials together with suitable experts, and that the Physical and Imperial Technical Institute of Charlottenburg be requested, through the Imperial Board of Home Affairs, to lend their co-operation in the investigation.

This decision is of great importance. From the results of the very numerous tests made by myself and others with the amyl-acetate lamp, it is evident that its convenience and steadiness is all that can be desired, but, as I have stated, its colour is against it in the opinion of the English experts. Could this be overcome, it would be a very convenient standard, but all efforts up to the present have failed to produce a light of the character of that given by the pentane and candles at their best. From my experiments I found that the forty millimetres height of flame was too low, but on raising it to fifty-one millimetres, or two inches, it gave results identical with the average English candle as determined by both the pentane and Methven screen.

I am informed by Dr. Krüss, of Hamburg, that while they agree that the colour of the amyl-acetate lamp is very unfavourable, they did not know of anything better, and therefore had to put up with it. They are now trying the improved pentane lamp of Mr. Harcourt, but the experiments are not yet concluded.

One of the objections put forward to a change of standard in England is, that no general desire has been expressed to that effect. It has been already shown that the authorities of the Board of Trade—the controlling authorities for gas-testing purposes in London—the gas interest generally, as represented by the Gas Institute, and the British Association, have all joined in one condemnation of the existing candle, and in demanding an alteration, and, with one exception, that such alteration should consist in the adoption of Mr. Harcourt's pentane air-gas flame. It has also been said that no alteration can be made in London without affecting the country generally. If the regulations applying to the candles were general, that would be a strong argument, but at the present moment there are virtually two different standards in use. In the Metropolis Gas Act



the standard candle is defined as "sperm candles of six to the pound, and burning at the rate of 120 grains per hour." In the instructions of the Gas Referees it is prescribed that the candles shall attain their "normal rate of burning," and no mention whatever is made of their *manner* of burning. In the Gas Works Clauses Acts, 1871, however, which applies to the country outside the metropolis, it is specifically laid down that the tip of the wicks shall be glowing and slightly bent, and thus a distinct condition is indicated. True, most photometrists decline to use the candles in any other manner, but it has been repeatedly argued, on behalf of the gas authorities, that an examiner has no discretion provided the consumption of the sperm is within the prescribed limits, so that a test is a perfectly legal one when the wick is upright, and the candle consequently giving less light, with the result of indicating a higher value to the gas than it otherwise would have. Such a condition of things does not argue well for the maintenance of uniformity in the manner of testing the value of the gas supplied in such enormous volumes to the public. If those outside the metropolis are satisfied with the better protection they now have, it is no reason why a less sufficient protection should satisfy the inhabitants of London. It cannot be imagined, however, that the general public of the country are aware of the present defective condition of the question. In all other matters affecting the commercial transactions of daily life, the most stringent regulations are in force to maintain almost mathematical accuracy in the various weights and measures used. In the matter of light alone the utmost laxity prevails, and when it is considered that such vast interests are at stake, it seems almost inconceivable that the legalisation of an accurate standard of light, such as can now be obtained, should be delayed for a moment longer than that required to take the necessary steps.

### THE AGREEMENT OF COLOUR THEORIES WITH PRACTICAL EXPERIENCE.\*

**A** KNOWLEDGE of the scientific rules of colour seems to me much more essential in decorative than in picture-painting. In the latter an artist has generally his subject before him; but in decoration and the applied arts, he has, as it were, to invent his colour scheme from his knowledge of colours, all of which are influenced by definite physical laws. It is well known that in decorations, especially those on a large scale, it is impossible for persons ignorant of the laws of colour to judge of what the ultimate effect will be while the work is in progress. Portions only of the colours to be applied are introduced at first, the hues of which will be very materially changed when the remaining colours are added and the scheme is complete. In my own applications of colour I have invariably found that, by subjecting my schemes to scientific rules, I have not only avoided errors, errors easily fallen into in so relative a subject as colour, but I have certainly attained higher results than I could possibly have done without them, and not had to make repeated alterations, entailing additional expense, so often found necessary as a scheme drew near completion.

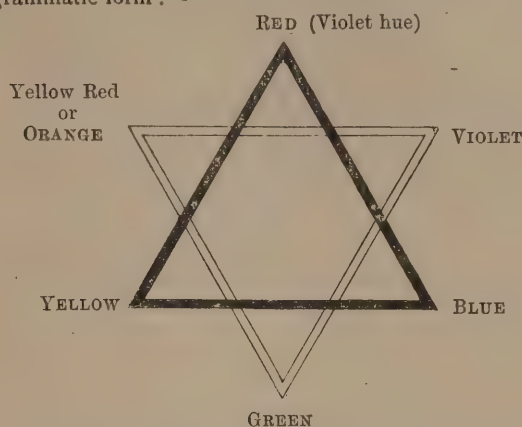
Perhaps the most important principle, and that upon which all others depend, is that there are three primary colours—three colours from, or by, which all other colours may be obtained, innumerable as the number of hues, tones, and shades are. Though the three primaries produce all other colours, yet they themselves cannot be obtained by any admixtures. Artists and physicists both agree as to their being three primary colours, but they differ as to the particular colours.

The artist finds, from practical experience, that almost all colours may be obtained by mixtures of three simple or elementary pigments, in different combinations or degree. The physicist explains that all colours are due to the excitation of three simple or elementary nerves, or sets of nerves, in the retina of the eye, by the different lengthened vibrations of which all white light consists. The artist names the colours of the three primary pigments, red, yellow, and blue. The physicist generally names the three primary sensations, red, green, and violet.

It appears, therefore, that there are two sets of primary colours: first, the colours of the primary pigments; secondly, what may be termed the colours of the primary sensations. It is essential to note this distinction—the first set has to do with pigments, or objects causing certain sensations; the second set has to do with those sensations themselves.

It will be observed that, with the exception of the red, the colours of each set are differently named. That red should be the only colour common to both seems very remarkable, and at once suggests the inquiry whether the hue of red in each case is the same or different? Referring, in the first instance, to the two other colours in each set, we find that they are not common, but are the very reverse. They are not only differently

named, but the one set contains the mean colour between two colours of the other set, and is therefore opposite, or complementary to the third, as may be best illustrated in diagrammatic form:—



The triangle with the strong outline represents the three primary pigment colours—that with the faint outline represents the primary colour sensations.

Thus green is the mean colour between, or may be obtained by the mixture of the primary pigments blue and yellow, and is complementary to the remaining primary red. Violet is the mean colour between, or may be obtained by the mixture of the primary pigments red and blue, and is complementary to the remaining primary yellow. Any one who has mixed pigments knows these assertions to be facts. Yellow is the mean colour between, or may be obtained by the combination of red and green light, and is complementary to the remaining primary sensation, violet. Blue is the mean colour between, or may be obtained by the combination of green and violet light, and is complementary to the remaining primary sensation, named by the physicist red. Physical experiments have proved these statements.

The term red, though common to both sets, cannot be the exact colour obtained by two different combinations, or be produced by the mixture of itself with another colour; such a suggestion seems absurd. It cannot, if we are to understand a distinct hue by the name, be the mean colour between itself and both violet and yellow; that is, the particular hue of red will not remain the same when violet or yellow are added to it. The difference of hue between a red and violet mixture and a red and yellow mixture would be very considerable indeed, about as far apart as two reds could well be, as shown on diagram. Yet if the two other colours of the one set, when combined, produce one of the colours of the other set, it seems reasonable to conclude that the remaining colour red should, when similarly combined, produce a similar result. According to this, however, red and violet produce red, and red and yellow produce red! Two different combinations seem to produce the same result, which is impossible, for the two resulting hues would be, as I have just pointed out, as different as they well could be under the general name of one colour.

Red, then, seems to be a very general and ambiguous term; for it is evident that the hue of red in the one set is very different from that in the other, that the artist's primary red pigment and the physicist's primary red sensation are totally dissimilar—the one being of a crimson or violet hue, the other of an orange hue. It seems desirable, therefore, that either the artist or the physicist, or both, should adopt some more definite term to describe a colour in which they can only agree in name and not in fact; for much confusion and apparent antagonism between the art and science of colour, as regards the primary colours, has already been occasioned by this indefiniteness of meaning.

The ambiguity regarding the names of colours is well known, and to it much uncertainty may have been due; indeed, ambiguity in so relative a subject as colour can hardly be avoided. It requires but a very elementary knowledge of colour effects to know that colours may be made to appear very different by changing, not themselves, but those with which they are associated or juxtaposed. Red may be made to appear orange or crimson, green may be made to appear blue or yellow, and so on; it entirely depends on what colours are put next to them. Chevreul's book is full of such instances. It is not, therefore, at all extraordinary that colours should be misnamed when they have such chameleonlike properties. A colour also appears very different under different conditions of light. Two rooms, for instance, coloured exactly alike, but one having a southern and the other a northern aspect, would appear very different. The yellow light of gas has, of course, a marked effect, as also the coloured light of stained-glass. Ambiguity, however, in colour is not entirely due to these causes. Without even taking into account

\* From a paper by Mr. G. H. Morton, jun., read before the Art Congress, Liverpool.



the variableness of the colour sense in different individuals, which is undoubtedly very great, there is another important point, and that is the very gradual way by which the most opposite colours may be connected. There are no distinct lines, as it were, between colours. It would be difficult, indeed impossible, to point out exactly where the red, green, or violet of the prismatic image began or ended; and when out of the innumerable perceivable tints we have to name three, or six, principal colours, it is impossible that the exact hue of each of these colours can be distinctly and definitely described. Only an approximate idea can therefore be given. Of reds we have orange and crimson reds, and all the hues between these two extremes, yet all are reds; of yellows we have orange and greenish yellows, yet all are yellows; and of blues we have greenish and violet blues, yet all are blues. The six principal colours only have been named; but when it is borne in mind that it has been estimated that the eye can distinguish not less than two million distinct tints of colour, the difficulty of determining their exact hues will be at once understood.

It is desirable, however, that the particular hues of the primary pigment colours and the primary sensations of colour should be as nearly as possible defined, so that we may ascertain their relationship to each other, and also whether there is a difference of hue between the so-called primary red pigment and the primary sensation named red.

The hue of a primary pigment is decided by that hue which will mix with both of the other primary pigments—in other words, with the greatest number of other colours, and still retain brightness, or not cause the compound colour to become "dirty" or "muddy." This is ascertained by practical experience rather than by physical experiment. Most persons know, for instance, that blue and yellow pigments when mixed together produce green, and that blue and red produce violet. The question is, what particular hue of blue will produce the most brilliant green and violet when mixed with yellow and red respectively? It is a simple matter to get one hue of blue that will produce a good green, and another hue that will produce a good violet, but we have to decide on one particular hue that will mix well with both.

Generally speaking, the hue of each primary pigment tends towards blue, or away from red. The primary blue pigment is of a greenish rather than of a violet hue; this particular hue of blue mixes with both the other primary pigments, yellow and red, with less loss of colour than a violet-blue would do. Let us practically apply this: let Prussian blue represent the primary greenish-blue, and ultramarine the violet-blue. It will be observed that Prussian blue mixes well with red on the one hand, and with yellow on the other, producing tolerably bright violet and green. Ultramarine, however, though it mixes even better with the red (because being a violet or reddish blue it is naturally more analogous or sympathetic with red), at once loses colour, and produces a less bright or "dirty" effect when mixed with yellow. Hence the hue of Prussian blue is nearer the hue of the primary pigment blue than the hue of ultramarine. The primary blue pigment is consequently of a greenish rather than a violet hue.

The hue of the primary yellow pigment is in like manner that particular hue of yellow which will, when mixed with blue and red respectively, produce bright green and orange. A yellow that has a slight greenish rather than an orange tint. King's yellow approaches, as near as most yellow pigments, the hue of this primary; it mixes well with both blue and red, producing tolerably bright green and orange respectively. A warm or reddish-yellow mixed with blue results in a "dirty" green or olive, consequently a yellow the reverse of this, a cool, slightly greenish-yellow, is the hue of the primary pigment yellow.

The primary red pigment, with which we are most concerned, because of its being the name given by artists and physicists alike to one primary in each set, is of a crimson or violet hue, the opposite of scarlet or orange. Rose madder or crimson lake are, for instance, nearer the hue of this primary than vermilion. If we mix any blue pigment with vermilion we at once neutralise the colour, and do not obtain bright violet or purple. We only obtain bright combinations by mixing it with yellow, the primary pigment nearest to it in prismatic order, and produce bright orange hues. With a bluish red, however, as rose madder, not only is it possible to obtain bright effects when mixed with blue, the primary nearest to it in prismatic order, but when mixed with yellow, the primary most opposite or farthest prismatically, bright orange hues result. Consequently, a red of a bluish hue, as represented by rose madder or crimson lake, indicates the more exact hue of the primary pigment red.

Blue, yellow, and red, of the particular hues I have endeavoured to describe and illustrate, are therefore the three primary pigment colours.

There is always a possibility of error in describing a colour by reference to a particular pigment. Pigments, bearing the same name, not infrequently vary very much in hue from one cause or another. The colour pigments I have enumerated are

given as the nearest to the particular hues I wish to describe. Coloured plates in books on colour are also often very misleading, due no doubt to printers' inexactness, or the fading of some of the colours.

In all practical mixtures the primary pigments would not necessarily be employed more than any others. The two colours to be mixed would be chosen as nearly as possible in hue. If an artist, for instance, desired a brilliant orange, he would obtain it by mixing a yellow and red as similar in hue as possible, as near together in prismatic order as could be obtained, say any warm yellow and vermilion; to use a greenish yellow or bluish red, as lemon chrome and lake, would of course introduce some blue, and thus tend to neutralise the compound orange, and make it dull or "muddy."

That the primary pigments should be of bluish hues is scientifically explained by the vibratory theory of light. It is well known that all colours are caused by vibration of different strengths affecting the eye; the stronger vibrations excite red, the weaker blue or violet. In combinations of colours, the weaker vibrations are more easily subdued. In mixing rose madder and yellow, the weaker blue and violet, or neutralising colours, which may be said to be present in the madder, are overcome and destroyed, and a bright secondary orange is the consequence. On the other hand, if vermilion and blue are mixed together, the stronger and more powerful vibrations of red and yellow assert themselves to such a degree that the weaker blue is neutralised, and a "dirty" colour having some slight resemblance to violet is the result. In this case the three primaries—red, yellow, and blue—are combined, the result of which, of course, produces a neutral or dull compound colour tinged with the predominating colours red and blue, which together make violet.

All colours are properly sensations, caused by the action of light on the retina of the eye. It is now, I think, generally admitted that there are three sets of nerves, and that each of these when excited produces a sensation we name colour. Hence colour does not exist outside ourselves, and, strictly speaking, it is as incorrect to allude to a pigment as a colour as it is to allude to any other sensation as being the object causing it. Instead of naming any object, say red, it would be more exact to say that the object caused us to experience the sensation of red, for often the object itself is the very opposite colour of what it appears to be. A colour object, or pigment, absorbs some of the white light shed upon it, and rejects the remainder, the rays rejected affect the eye, and excite there the sensation we name colour. In the case of a red pigment, all the blue and green producing rays have been absorbed, and the rejected rays excite red. No doubt it is much simpler to refer to pigments, or colour objects, as actually being the sensations rather than causing them, and many persons seem to have had great difficulty in grasping the distinction.

The primary sensations are, therefore, the only primary colours, properly speaking. They are generally named violet, green, and red. The violet is less red than is commonly conceived by that term; a warm ultramarine perhaps best describes it. Maxwell selected a violet-blue between the lines F and G on the spectrum, which, as Professor Rood points out, is represented tolerably well by artificial ultramarine. Benson in his "Science of Colour" names this primary blue, but as most authorities adopt the term violet, this name may, I think, be accepted as most correct.

The primary sensation green is represented in pigments by emerald green. There seems little difference of opinion as regards this colour.

The primary red sensation is distinctly an orange-red or scarlet, and, though Helmholtz selected a red not far from the end of the prismatic image which could scarcely be named orange, Maxwell adopted a red which in the spectrum lies between lines C and D. This is a scarlet-red, as Rood states in his "Modern Chromatics," with a tinge of orange, and is represented by some varieties of vermilion. Benson gives vermilion as best illustrating this primary red sensation, and perhaps all the authorities I have consulted describe a red the reverse of a crimson or violet-red. This primary sensation, therefore, appears to be the very opposite in hue from the primary red pigment. It is very evident that the idea conceived by the term red in the one set of primary colours is not the same as in the other set.

In order to avoid confusion a different name might be substituted for this colour in each set, based upon their particular hues, as crimson the primary pigment, and scarlet the primary sensation, which terms I adopted in a former paper\* on this subject. To ignore the old association of the six principal colours, however, and the omission of the term "red" altogether seems undesirable if it can be avoided.

Before attempting to suggest new terms, however, it is necessary to consider the secondary colours. In pigments they are usually, and I think correctly, named orange, green, and

\* "Colour Harmony." Paper read before the Literary and Philosophical Society of Liverpool during its seventy-second session.



violet, and denote the resulting colours from the mixtures of two primaries, red and yellow, yellow and blue, blue and red respectively. All the ambiguity relative to the primaries is also peculiar to these secondary colours, and indeed to all colour terms.

With the exception of the orange, the names of these secondary colours are the same as those given by physicists to two of the primary sensations; and as I have already explained that the primary sensation red is distinctly an orange red, it may, I think, be reasonably concluded that the colours of the primary sensations are the same as the secondary pigments, but much lighter and brighter. The primary pigments will therefore be the same as the secondary sensations. So-called secondary sensations of colour—that is, when two sets of nerves are excited simultaneously—are generally named yellow, sea-green or greenish blue, and pink. They are respectively produced by orange and green, green and violet, and violet and orange. The combination of two pure coloured lights naturally produces a much lighter and brighter colour, hence secondary colour sensations are much lighter—doubly as light as a primary. In order to compare them with a pigment, it is necessary to lighten the pigment by the addition of white. Upon doing so we find that red, yellow, and blue of the hues I described in the early part of this paper as representing the primary pigments respectively produce pink, pale yellow, and greenish blue, the hues of the secondary colour sensations.

A comparison might also be made by darkening the secondary colour sensations by interposing darkness.

If the foregoing is correct, it follows that the colours of the one set are complementary to the colours in the other, as may perhaps be best shown in tabular form:—

Primary colour pigments (secondary sensations).		Primary colour sensations (secondary pigments).
Blue . . .	complementary to . . .	Orange.
Red . . .	“ . . .	Green.
Yellow . . .	“ . . .	Violet.

The evidence of this relationship distinctly supports the theory that the hue of red in each set is and must be quite opposite. The colour complementary to, or required to neutralise blue, a compound of green and violet, would of necessity be of a totally different hue from that required to neutralise green, a compound of yellow and blue—the blue requires an orange, the green requires a red. A secondary colour being a compound of two primaries also supports it, for the resulting colour from the combination of violet and orange cannot be the same as that obtained by the mixture of yellow and red. The former, if produced without loss of light—that is, by the combination of violet and orange light—produces a pale bluish-red or pink; the latter by combination of yellow and red light, or by pigment mixture, produces orange. The primary pigments, therefore, appear to be the same colours as the secondary sensations, and the primary sensations appear to be the same colours as the secondary pigments, or rather approximate to, for even the most brilliant pigments are dulness itself compared with actual colour light.

As a rule, in all combinations of colour light, and of colour pigments, the opposite effects of light occur. Combinations of two colour lights produce a lighter effect; mixtures of two pigments usually produce a duller effect. The first might be called positive, the second negative colouring. The physicist in all his experiments has the actual light to operate with, and he finds that what he names red, but which I submit would be more correctly termed orange, green, and violet, produce perhaps all varieties of colours; hence he names these the primary colours. When an artist, however, mixes two pigments together, he has not the actual light to deal with—he has not orange, green, and violet-producing rays, but he has instead three pigments which have absorbed them. The colours of his primary pigments will necessarily be such as have absorbed these colours. The colour of the pigment which absorbs orange is blue, the pigment which absorbs green is red, the pigment which absorbs violet is yellow. Blue, red, and yellow are, therefore, the primary pigment colours, and are the reverse and opposite of the primary sensations orange, green, and violet.

It is possible that the term red, as commonly understood, does not convey to our mind the particular hue of either the primary sensation or the primary pigment. It has been made to do duty for both, and therefore exactly described neither. It denoted a colour too orange in the first case, and too violet in the second. The question, therefore, seems to be whether we should do away with the use of the term altogether, or give it a more definite and perhaps different meaning from what we are accustomed to do. To alter long familiar names is bad policy, and for myself I should prefer to understand by the term red a colour of a more violet hue than I formerly associated with it. We might, of course, add the prefixes crimson and orange as adjectives; but did we do so, it would be equally justifiable to add qualifying terms to the other colours, as an orange yellow, greenish yellow, and so on. I would, therefore, submit that by the term red is meant a colour of a more violet than orange

hue, best represented perhaps by the pigment rose madder; that the primary pigments be still named, as they have always been, red, yellow, and blue, and that the names of the sensations caused by the action of light on the three sets of colour appreciating nerves, be named orange, green, and violet.

By adopting different names to each set of primary colours, the antagonism often asserted as existing between the practical and physical facts of colour falls to the ground—indeed, science supports the knowledge of the artist gained by experience. The colours of either set—the primary pigments red, yellow, and blue, or the primary sensations, orange, green, and violet—when combined in certain relative proportions, produce harmony or neutrality.

### ANTIQUITY IN AMERICA.

IN America, comparatively a new country, any structure antedating the Revolution is “old,” consequently of interest to the Americans. The stone arch “Choate Bridge” spanning the Ipswich River at Agawam was built in 1764, and is one of the oldest, if not the oldest, stone arch bridge in the country. According to the *Boston Transcript* the builder was Judge Choate, a member of the Colonial Government of Massachusetts for many years and the commander of the 8th Massachusetts Regiment at the siege of Louisburg in 1745. In 1760 he was treasurer of Essex Co., and as such he superintended the outlay of the money appropriated by the county for this bridge. He advocated stone as the material, and planned the bridge against the wise sayings and head-shakings of his doubting contemporaries. The arches are low and the spans are about 35 feet each; but the Judge did not propose that his bridge should fall, and consequently the amount of stone used was enormous for the work to be done. He took the granite as it came from the ledge, unmarked by any tool; but the stone for the arch was carefully selected, and the work stands intact to-day as a monument to his ideas of a permanent structure.

### Bygones.

“Antiquity after a time has the grace of novelty.”—HAZLITT.

#### GOETHE'S CRITICISM ON THE HEAD OF ONE OF THE HORSES OF NIGHT IN THE BRITISH MUSEUM.

AS Carlyle was unkindly treated by nature in being sent into the world without any faculty that would enable him to appreciate the Beautiful, it naturally followed that he must make little of the power of which he was deprived. Goethe and Schiller were esteemed by him as great men; nevertheless he compared their efforts to define the principles of art to the wanderings of unfortunate people who were deluded by will-o'-the-wisps and floundered in quagmires. All that Carlyle says about art reveals his own shortcomings. Goethe, on the contrary, was not curtailed in his mental proportions by nature; he was a grand type of the “all-round man,” and as such he was attracted towards the Beautiful. It suggests the range of his sympathies when we find him in Weimar commenting on the agitation which was going on in England in 1816 for the acquirement of the Elgin marbles.

One of the accepted authorities in England at that time was Richard Payne Knight. He considered the finest of the Parthenon marbles as not entitled to be placed in any but the second rank of sculpture, and if sold in detail the prices would not, he said, realise more than about 10,000*l.*, although he valued the collections as a whole at 25,000*l.* His appreciation of the head which was supposed to belong to one of the horses of Night is seen by the price he fixed on it, viz., 250*l.*, admitting, however, that it was “very fine.” Visconti described the head as being of the finest possible workmanship, and as having that admirable expression of life which great artists only are capable of bestowing on their imitations of nature. The most enthusiastic of the advocates for the purchase of the statuary was the unfortunate B. R. Haydon, the painter, and it followed that he must be in opposition to Payne Knight.

It was characteristic of Goethe that seeing so much variance about a definite subject he should try to discover where the truth lay. As the horse's head from the Parthenon had been compared with those of the horses upon St. Mark's, Venice, which once stood on an arch in Rome, he compared the two kinds of work in the article which follows:—

“A Mr. Payne Knight, who seems to be a man of much influence, had expressed a very unfavourable opinion respecting the Elgin marbles; denying them to be possessed of any merit, and maintaining they were of the age of Hadrian, and executed by common workmen, who hardly deserved the name of artists.



Mr. Haydon, an able artist, maintains, on the other hand, that Mr. Payne Knight knows nothing at all of art; and in fact, if he has really delivered the opinions attributed to him, we can hardly help suspecting as much. Mr. Haydon, however, in his well-meant zeal for the figures carried off from the Parthenon, has allowed himself to go too great lengths, when he maintains that the Elgin marbles are superior to all other works of art in existence; that they will cause the old antiques to be forgotten. He rather injudiciously observes that if these marbles had been lost, there would have been as great a blank in the progress of art as there must have been in philosophy if Newton had never existed.

"Mr. Haydon has entered into a comparison between a large horse-head of marble from the Parthenon, and a head of one of the four bronze horses at Venice, which, agreeably to common report (for which, however, there is no authority), he calls the horses of Lysippus. Mr. Haydon, however, does not enter on the subject of the name, but merely compares the two works of art, and, as might be expected from his Essay against Mr. Payne Knight, he gives a decided preference to the Athenian head. To the Venetian head he assigns an incorrect shape: condemns the position of the eyes, and affirms that the jaw is of an undecided form. When we view the two works in profile, the Venetian head does appear shut, and somewhat ox-like, the nostrils too are not in the right place, and the upper lip does not project sufficiently; while the Athenian head has all the character of a spirited horse of noble race. Not content, however, with extolling this noble work of art, Mr. Haydon has unnecessarily and unjustly depreciated the Venetian horses.

"We enjoy the advantage of having beside us very fresh casts of the two heads, the subject of Mr. Haydon's comparison, and can therefore enter into a close examination of his assertions.

"The Venetian head and the Athenian are both admirable works, and each excellent in its way. A slight acquaintance with the monuments of ancient art will enable any one to perceive a striking difference of style between them. In the Athenian head the prevailing character is sublimity. The Venetian bronzes again are executed in a more soft, flowing, and ornamental style, and undoubtedly in a later age.

"The Athenian horse is higher, more powerful, snorting, with a startled look; the eyes are rounded and projecting. The ears hang back, and the mouth, which is opened, seems to be exerting itself violently to get forwards, but to be powerfully kept back. When we look at the workmanship, we everywhere observe antique simplicity, and the most praiseworthy diligence and truth, but at the same time a little stiffness. For example in the mane: line is regularly laid on line, parallel to each other, and of the same depth; and in the bend of the throat, one fold of the skin is placed beside another, with hardly any variety. The execution in general merits great praise, the muscles and bones are represented with great knowledge, expression, and truth. The eyes are admirably formed and perfected; the forehead is broad, flat, and bony; the nostrils widely extended from the current of breath; the upper lip, as if animated and in motion. Though the marble has been much injured by the weather, from the nose upwards to the forehead, we perceive, notwithstanding, the traces of veins originally existing there.

"In the head of the Venetian horse, which we have now before us, all appears much smoother, and more ornamental; the outlines are more flowing, and run more softly into each other; the animal is represented much more tranquil and gentle; as pleased and glad, and willingly obeying the rein. The master has conceived the whole in his milder character; the proportion of the parts is suitably selected, the eyes have a softer look, and though the pupil is powerfully marked, they are not so round, not projecting as in the Athenian head, but kept flatter, drawn more backwards, especially towards the apple of the eye under the eyelid, which covers it considerably. It cannot be denied that there is some deviation from nature in this part, and an approximation to the shape of the human eye. The ears are in playful movement, the right back, the left somewhat bent forward, the nostrils, suitably to the general character, less opened, less snorting, but like the upper lip not so natural, nor so animated as in the Athenian figure.

"With respect to the execution, the most striking difference is also perceptible between them. In the Venetian horse (though everything is generally more strictly marked in bronze works) the hair of the mane is much more ornamental, less stiff, and the lines more varied; and the same may be said of the folds of the skin in the throat. As the prevailing character is the soft and agreeable, the muscles and bones are less determinately marked, and the transitions milder and more flowing. We have pronounced no opinion respecting the relative merits of the two works, but merely pointed out the diversity of style, and consequently their different ages. More than this ought not to be attempted, and the one should not be eulogised and the other depreciated; for both are admirable, and to censure either the one or the other ill becomes us, as each is far beyond the powers of any artist of the present day. We cannot, however, conceal that our inclination is more particularly directed

to the Athenian work, and with respect to it we might perhaps agree with Mr. Haydon. But we would merely recommend it to him, and still more to German connoisseurs, to reflect that in order to praise what is admirable it is not necessary to load other works, which are also admirable in their way, with faults which do not belong to them."

The article will give a good notion of Goethe's critical method. In the first place he abominated rows, and could not therefore approve of the heat which Haydon displayed in the controversy. Then he was analytical, as we can see, and contrasted detail with detail. But he was not the man to undervalue a work which was placed second. Indeed Goethe was never over-enthusiastic about the masterpieces of art or literature. Their merits might be very great, but on that account he knew there was a prepossession that they were unsurpassable. Goethe had too much faith in humanity to lose confidence in the possibilities of genius. For that reason he insisted on audacity being a strong quality with an artist which would not only enable him to follow his own bent, but to resist all efforts to hamper his talents. At the same time he counselled the closest communion with the masters of art, and discriminated between following art in one's own way and following art's way. But no man could be more opposed than Goethe to the notion that it is possible to produce a work of art by recipes.

In judging his criticism on the horse's head in the British Museum it is well to remember that Goethe had only a plaster cast before him, which could not convey any notion of the bony character of the original.

### GENERAL.

**The Duke of Westminster** has presented Turner's *Dunstanborough* to the National Gallery of Melbourne.

**The Exhibition** of the Royal Society of Artists, Birmingham, will close on Saturday, January 5.

**The West Window** of Exeter Cathedral is to be filled with stained-glass, at a cost of 1,000*l.*, as a memorial of the late Earl of Devon.

**A Reredos**, designed by Mr. J. G. Crowther, has been placed in St. Saviour's (Cathedral) Mission Church, Cheetham.

**A Paper** on "Art and Architecture" was read by Mr. J. W. Knowles, art decorator, at the monthly meeting of the York Architectural Association.

**Photographs** of the walls of the Walker Exhibition Rooms, Liverpool, showing the pictures, are to be preserved by the Corporation Art Committee for future reference.

**A Reredos** in stone has been designed for the parish church of St. Mary de Crypt, Gloucester, by Mr. F. S. Waller, and executed by Mr. Frith, of Gloucester. The three central panels of coloured mosaics, designed by Mr. Westlake, were carried out by Messrs. Salviati & Co., at Venice.

**Mr. J. A. Reeve** having completed his measured drawings of Fountains Abbey, the reproductions of these will shortly be issued to subscribers.

**The Dumbarton** Dean of Guild Court on Monday approved of plans for the erection of a cottage hospital to contain eight beds.

**Mr. J. H. Middleton** is to deliver at the Royal Institution four lectures on "Houses and their Decoration, from the Classical to the Mediæval Period."

**The old Tile and Pottery Works** at Portland Road, Notting Hill, are to be converted into a recreation ground for residents in the district.

**A New Hospital** for infectious diseases has been erected at Faversham, and special attention has been paid to the ventilation, the latest improved form of Messrs. Robert Boyle & Son's patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

**A Deputation** from the Glasgow Corporation has paid a visit to Edinburgh. The powers of the authorities in Glasgow in dealing particularly with insanitary houses, it seems, differ materially from those at the disposal of the local authority of Edinburgh, and the object of the visit was, it is understood, in view of a probable application being made for additional powers, to get information on the spot as to the way in which the work is carried out.

**The Pictures** lent to the Birmingham Corporation Art Gallery by the Duke of Norfolk and the Duke of Westminster have now been removed, and their places have been supplied by a number of works belonging to the Belhus collection, lent by Sir Thomas Barrett Lennard, for which room could not previously be found. They include examples of Guercino, Romney, Hoppner, Berghem, De Heem, Sir Peter Lely, Sir Godfrey Kneller, and other painters of note.

**Mr. John Livingston**, of Musselburgh, has offered a sum of 500*l.* as the basis of a fund for the building of a new hall for Inveresk parish church. The hall is to be for congregational purposes, and will be built away from the church.



A Business Supplement

# The Contract Reporter.

to The Architect.

LONDON, DECEMBER 28, 1888.

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### TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 p.m. on Thursdays.

Correspondents, when writing to notify an extension of time, or an alteration of the date of sending in Competitions or Contracts, are requested in their letter of advice to write at the head of the required change—"Contract Reporter to THE ARCHITECT."

### COMPETITIONS OPEN.

SCARBOROUGH.—March 1.—Designs and Estimates are invited for Laying-out Portion of the Corporation Landed Estate called Weaponness Valley. Premiums of 150l. and 50l. respectively offered. Mr. Joseph Petch, Borough Surveyor, Town Hall, Scarborough.

SOUTHAMPTON.—Feb. 1.—The Executors of the late Mrs. Harriett Bellenden Sayer invite Designs for Drinking Fountain to be erected at Southampton. Premium of 20 guineas. Messrs. Sharp, Harrison, Turner & Turner, Solicitors, Southampton.

ST. THOMAS.—Jan. 2.—Plans and Elevations are invited for the Erection of Board Schools. Mr. J. Champion, Clerk to the School Board, St. Thomas, near Exeter.

YORK.—Feb. 16.—Designs, &c., are invited for the Erection of Courts of Justice and Police and Fire Brigade Stations. Premiums of £100, £50, and £25. Mr. George McGuire, Town Clerk, Blake Street, York.

### CONTRACTS OPEN.

ABERTILLERY.—Jan. 5.—For Sinking 14-feet Pit for the Tillery Coal Company. Colliery Offices, Abertillery.

ALNWICK.—Jan. 7.—For Building Church Schools and classrooms. Mr. F. R. Wilson, Architect, Alnwick.

BARNSTAPLE.—Jan. 7.—For Building Second Section of the Victoria Temperance Hotel. Mr. W. C. Oliver, Architect, 19 Cross Street, Barnstaple.

BARNOLDSWICK.—Dec. 29.—For Building Weaving Shed for the Calf Hall Shed Company, Limited. Mr. W. H. Atkinson, Smith's Chambers, Colne.

BELFAST.—Dec. 28.—For Building Pair of Villas at Whitehead for Mr. J. Raphael. Mr. J. Russell, Architect, 16 Waring Street, Belfast.

BLAENAVON.—Jan. 1.—For Single-lift Gasholder (50 feet by 18 feet) with Cast-iron Columns, Wrought-iron Lattice, Girders, &c. Mr. C. White, Manager, Gas and Waterworks Office, Blaenavon.

BRIGHTON.—Dec. 31.—For Erection of Two Blocks of Infirmary Buildings and Enlargement of Infants' Ward at the Workhouse. Mr. B. H. Nunn, Architect, 129 Queen's Road, Brighton.

DARWEN.—Jan. 31.—For Three Purifiers, with Pillars and Girders. Mr. P. Dunbury, Gas Engineer, Charles Street, Darwen.

DURHAM.—Dec. 28.—For Works of Heating (Low Pressure System) at Workhouse, Crossgate. Mr. W. Crozier, jun., Shire Hall, Durham.

ENFIELD.—Jan. 8.—For Building Workroom at the Workhouse, Chase Side. Mr. T. E. Knightley, Architect, 106 Cannon Street, E.C.

FARNHAM.—Jan. 8.—For 3-inch Cast-iron Socket Water Pipes and Castings (490 yards), coated with Dr. A. Smith's Patent Varnish. Mr. W. Wells, 112 West Street, Farnham.

FINSBURY PARK.—Jan. 8.—For Recessing Gates and Piers, Blackstock Road Entrance. The Architect, Metropolitan Board of Works, Spring Gardens, S.W.

FLEETWOOD.—Dec. 31.—For Additions to Board Schools, Blakiston Street. Mr. T. Garnett, Architect, Pharos Street, Fleetwood.

GLASGOW.—Dec. 31.—For Temporary Bridge over the Kelvin, Removing Old and Erecting New Bridge of Iron and Steel, with Stone Abutments, &c. Messrs. Miller & Bell, C.E., 204 St. Vincent Street, Glasgow.

GUILDFORD.—Jan. 12.—For Construction of Swimming and other Baths. Mr. H. Peak, Borough Surveyor, Guildford.

HALIFAX.—Jan. 9.—For Building Nine Houses, Range Bank. Mr. James Farrar, Architect, 29 Northgate, Halifax.

HAMMERSMITH.—Jan. 4.—For Additional Buildings at the Police Court. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

HAWARDEN.—Jan. 1.—For Construction of Railway Bridges and Earthworks. Mr. F. G. Whitwham, 8 Draper's Gardens, Throgmorton Avenue, E.C. Plans at the Engineer's Office Old Vicarage, Wrexham.

IPSWICH.—Jan. 1.—For Building Parcel Sorting Office. The Secretary, H.M. Office of Works, 12 Whitehall Place, S.W.

KENDAL.—Jan. 2.—For Building Terrace of Seven Houses. Mr. Gerrard Huck, Architect, 16 Lowther Street, Kendal.

KING'S LYNN.—Jan. 2.—For Building Fever Hospital, Horsley's Chase. Mr. E. J. Silcock, Borough Surveyor, King's Lynn.

LEEDS.—Jan. 1.—For Pulling-down sundry Buildings in Basinghall Street, for Messrs. Beck & Inchbold. Mr. William Bakewell, Architect, 38 Park Square, Leeds.

LEWISHAM.—Dec. 28.—For Works in connection with Colfe's Grammar School, for the Leathersellers' Company. Mr. E. Lyne Parsons, Architect, 236 High Street, Exeter.



LICHFIELD.—Jan. 1.—For Alterations and Repairs to Shenstone Moss. Mr. R. P. Cooper, Westgate House, Lichfield.

MORLEY.—Dec. 29.—For Building Mission Chapel for St. Mary's Congregational Society. Mr. T. A. Buttery, Architect, Queen Street, Morley.

PADSTOW.—Dec. 28.—For Restoration of Chancel of Parish Church. Messrs. R. Langford & Son, North Quay, Padstow.

PENRITH.—Jan. 12.—For Execution of Works of Water Supply for Three Villages. Mr. Watson, Engineer, St. Andrew's Place, Penrith.

ROTHERHAM.—Dec. 28.—For Works in the Erection of Public Market Hall. Mr. Archibald Mill, 19 East Parade, Leeds, or the Borough Surveyor, Rotherham.

SHEFFIELD.—Jan. 7.—For Resheeting Two-lift Gasholder, and Enlarging same. Mr. Fletcher W. Stevenson, Engineer, Gas Offices, Commercial Street, Sheffield.

SHIPLEY.—Dec. 31.—For Construction of Abattoir. Mr. Samuel Jackson, Architect, 33 Kirkgate, Bradford.

SOUTHPORT.—Jan. 1.—For Building Independent Church. Messrs. W. Waddington & Son, Architects, Mansfield Chambers, Manchester, and Grimshawe Street, Burnley.

STORRINGTON.—Dec. 31.—For Steam-Cooking Apparatus for 100 persons for the Thakeham Union. Mr. W. T. Sandford, Clerk to the Guardians, Storrington, Sussex.

SWINDON.—Jan. 2.—For Rebuilding No. 6 Wood Street. Mr. W. H. Read, Architect, Corn Exchange, Swindon.

### TENDERS.

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For Additional Works for Disposal of Sewage, Acomb, near York. Mr. C. HORNSEY, Surveyor, York.  
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For Building Shops, &c., for the Committee of the Berkhamstead Co-operative Society. Mr. J. F. GOODEY, Architect, 2 Victoria Chambers, West Stockwell Street, Colchester.

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E. Jarvis, Portsmouth . . . . .	2,239 0 0
A. Cole, Kilburn . . . . .	2,150 0 0
G. Dobson, Colchester . . . . .	2,124 0 0
J. Payne, Hemel Hempstead . . . . .	2,120 0 0
Claridge & Bloxham, Banbury . . . . .	2,109 0 0
Smith & Son, Tring . . . . .	2,090 0 0
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Steers . . . . .		2,458	0	0
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Coleman & Fathers . . . . .		2,397	0	0
J. P. WHITE (accepted)				

## BRADFORD.

For Building Shops and Business Premises, Rawson Place, Bradford. Messrs. FAIRBANK & WALL, Architects, Craven Bank Chambers, Bradford.

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T. Haigh, Allerton, near Bradford, mason . . . . .	£88c	0	0
Rhodes Bros., Shipley, joiner . . . . .	665	0	0
R. Howroyd, Lamb Lane, Bradford, plumber . . . . .	198	0	0
C. Howroyd & Sons, Manchester Road, Bradford, plasterer . . . . .	128	0	0
A. Hill, Spring Row, Bradford, slater . . . . .	47	0	0
J. Arundel City Road, painter . . . . .	22	0	0

For Building Eight Houses and Shops in Great Horton Road. Mr. W. RYCROFT, Architect, 10 Bank Buildings, Manchester Road, Bradford.

## Accepted Tenders.

J. Thornton, Great Horton, mason . . . . .	
J. & S. Copley, Bradford, joiner . . . . .	
W. Triffit, Bradford, plumber . . . . .	
Stocks & Bates, Bradford, plasterer . . . . .	
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For Works of Sewerage for the Local Board, East Stonehouse, Devon.

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Duke & Co., Plymouth . . . . .	33	14	0
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SHADDOCK BROS., Mutley (accepted) . . . . .	24	0	0

## HARROW.

For Building Mortuary, Stabling, Cottage, &c., at Roxborough Corner, Harrow, for the Harrow Local Board. Mr. C. F. HAYWARD, Architect, 47 Museum Street, Bloomsbury, W.C.

Chappell, Lupus Street . . . . .	£1,371	0	0
Lake, Hackney . . . . .	1,344	10	0
Tunks, Willesden . . . . .	1,255	0	0
F. & F. H. Higgs, Loughborough Junction . . . . .	1,250	0	0
Barrett & Power, Hackney . . . . .	1,232	0	0
Ward, Clark & Co., Pomeroy Street . . . . .	1,207	0	0
Mills, Stoke Newington . . . . .	1,173	0	0
Telbury, Willesden . . . . .	1,157	0	0
Knight, Morden, Surrey . . . . .	1,155	0	0
Holloway, Lavender Hill . . . . .	1,147	0	0
Woodhouse, Woodford . . . . .	1,140	14	0
Savage, Homerton . . . . .	1,087	0	0
Henley & Co., Moorgate Street . . . . .	1,081	0	0
Gibson, Southall . . . . .	1,067	0	0
A. & B. Hanson, Southall . . . . .	1,025	0	0
Haynes, Alperton, Harrow . . . . .	1,009	0	0
Elwood, Sandy, Beds. . . . .	992	0	0
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For Building Classrooms, &c., at Park Wood Street Board School, Keighley. Messrs. W. & J. B. BAILEY, Architects.

## Accepted Tenders.

H. V. Robinson, Keighley, mason . . . . .	
Verity & Shuttleworth, Keighley, joiner . . . . .	
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Trickett & Sons . . . . .	1,972	0	0
Rutty . . . . .	£1,790 or 1,910	0	0
W. Porter . . . . .	1,720	0	0
W. Griffiths . . . . .	1,710	0	0
G. Bell . . . . .	1,665	0	0
Wheeler . . . . .	1,547	0	0
KNIGHT (accepted) . . . . .	1,119	0	0
Surveyor's estimate . . . . .	2,025	0	0

## Sewers.

Rutty . . . . .	549	0	0
Bell . . . . .	541	0	0
Trickett & Sons . . . . .	528	0	0
W. Porter . . . . .	503	9	0
JACKSON (accepted) . . . . .	475	0	0
Surveyor's estimate . . . . .	538	10	0

## For Paving Rippoth Road.

Glenny . . . . .	£455 or 465	0	0
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Knight . . . . .	441	0	0
Rutty . . . . .	£360 or 415	0	0
Victoria Stone Co. . . . .	407	0	0
WHEELER (accepted) . . . . .	£395 or 349	0	0
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## For Paving Smeed Road.

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Glenny . . . . .	£130 or 133	0	0
Wheeler . . . . .	£114 or 128	0	0
RUTTY (accepted) . . . . .	£109 or 125	0	0
Victoria Stone Co. . . . .	113	0	0
Surveyor's estimate . . . . .	122	0	0

For Erection of Shaft at the Wharf, for the Mile End Old Town Vestry.

Hawkings . . . . .	£470	0	0
G. Lusk . . . . .	397	0	0
LYE (accepted) . . . . .	358	0	0

## Furnace.

Cole & Co. . . . .	185	0	0
FRASER (accepted) . . . . .	172	10	0

## LONDON—continued.

For Chimney-shaft and Furnaces at Mile End Wharf, for the Vestry of Mile End Old Town. Mr. J. M. KNIGHT, Surveyor.

## Brickwork.

L. W. Hawkings, Mile End . . . . .	£470	0	0
G. Lusk, Mile End . . . . .	397	0	0
T. Lye, Sutton, Surrey . . . . .	358	0	0

## Ironwork.

T. Cole, Burdett Road . . . . .	185	0	0
Fraser & Fraser, Bromley-by-Bow . . . . .	172	10	0

## LUTON.

For Painting, &c., at the Ladies' Swimming Bath. Mr. W. H. LEETE, Borough Surveyor, Luton.

C. Haydon . . . . .	£17	5	0
T. Wood . . . . .	16	10	0
F. J. Pedley . . . . .	12	0	0
W. Lines . . . . .	8	0	0
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For Pipe Sewer, with Manholes, &c., Rushall, for the Walsall Union Rural Sanitary Authority. Mr. T. T. FISHER, Surveyor, Lichfield Chambers, Walsall.

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J. Evans, Walsall . . . . .	145	0	0
H. Hughes & Son, Lower Gornal . . . . .	130	0	0
S. E. FRAYNE, Birmingham (accepted) . . . . .	104	6	6

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Ball . . . . .	337	10	0
F. Miller . . . . .	328	10	0
A. Halford . . . . .	320	0	0
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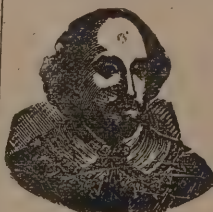
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Hall & Jennings, Shipley, joiner.  
W. Thornton, Bingley, slater.  
A. Higginbotham, Idle, plumber.  
Callaway, Bradford, plasterer.  
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J. Clarence, Bullisodare and Sligo . . . 1,710 0 0  
FRANCIS GOGARTY, Drogheda (accepted) . . . 1,590 0 0

TURTON.

For Construction of Pipe Sewers (620 yards), Egerton, for the Turton Local Board. Mr. JAMES PARKINSON, Engineer, Station Road, Turton.

H. Dawson, Bury . . . £471 0 0  
W. Taylor, Chorley . . . 401 0 0  
R. Malabar, Port Erin . . . 371 0 0  
J. Oakes, Stoneclough . . . 363 0 0  
A. WATSON, Farnworth (accepted) . . . 337 0 0

WOOLWICH.

For Building Wing on the East of the Woolwich Infirmary at Plumstead, for the Guardians. Mr. J. O. COOK, Architect, 1A Eleanor Road, Woolwich.

Hart Bros., Great Dover Street . . . £10,460 0 0  
F. Johnson, Woolwich . . . 10,400 0 0  
Multon & Wallis, Gravesend . . . 10,100 0 0  
H. Stiff, Dover . . . 9,859 0 0  
Coombs, Plumstead . . . 9,850 0 0  
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Kirk & Kandall, Woolwich . . . 9,425 0 0  
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Wallis & Sons, Maidstone . . . 8,934 0 0  
Richardson, Peckham . . . 8,724 0 0

THORNTON.

For Building United Methodist Free Church Sunday Schools Classrooms, and Caretaker's House, Thornton. Mr. WILLIAM RYCROFT, Architect, 10 Bank Buildings, Manchester Road, Bradford.

Accepted Tenders.

F. Robinson, Thornton, near Bradford, mason.  
J. Patchett, Clayton, Bradford, joiner.  
E. Bairstow, Thornton, Bradford, plumber, painter, and heating apparatus.

Stocks & Bates, Bradford, plasterer.

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Total, £1,473 5s.

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F. Akery, Windsor . . . 195 10 0  
C. Hally, Slough . . . 183 1 0  
Torode, Tottenham . . . 170 0 0  
Foreman, Windsor . . . 164 0 0  
E. W. Kelly, Windsor . . . 143 0 0  
J. KAY, Windsor (accepted) . . . 140 0 0  
Currell & Lewis, Birmingham . . . 138 0 0

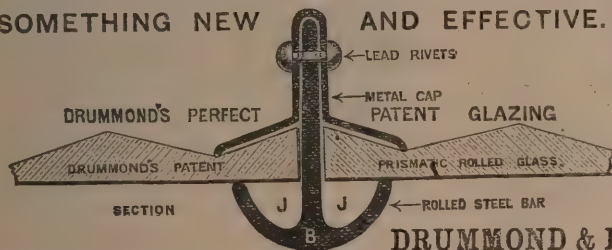
For Making-up Temple Road, Windsor. Mr. T. V. DAVISON, Surveyor.

Torode . . . £243 0 0  
Hawkins . . . 199 0 0  
Hally . . . 189 17 6  
Bradshaw & Co. . . 154 0 0  
Free & Sons . . . 149 10 0  
Currell & Lewis . . . 145 0 0  
J. Kay . . . 139 0 0  
F. AKERY (accepted) . . . 133 0 0

TRADE NOTES.

"WALKS IN HOLLAND," an illustrated handbook to some less frequented parts of Holland, including Friesland, Groningen, and Guelderland, edited by Mr. Percy Lindley, is in preparation. A chapter upon sculling and sailing in Dutch waters will be written by the editor.

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THE Edinburgh and Leith master builders and operative masons have entered into an agreement that 7d. per hour be the uniform wage for one year in Edinburgh and Leith from March 1 next.

A REREDOS in oak, as a memorial to the late rector, has just been fixed in Buriton parish church, Hants. The work has been executed by Messrs. Jones & Willis, of London and Birmingham, from the drawings of Mr. F. W. Cave, architect, London.

THE new school, Tyldesley, is warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester and London.

A FIRE occurred on Friday night in the extensive premises of Messrs. Bissett & Sons, contractors, of Sheffield. It was found that the fire originated in a large central building, in the lower portion of which was stored valuable timber. The upper part was used as the joiners' shop, and was filled with machinery. The building was gutted. The loss, which amounts to many thousands of pounds, is covered by insurance in the Alliance. The tools of the men were destroyed.

MR. DANIEL WATNEY, the arbitrator in the case of Reilly v. Manchester Ship Canal, which occupied seven days at Manchester, has issued his award. The inquiry was held to assess the value of the property at Manchester known as the Pomona Palace and the Agricultural Hall, with the grounds and adjoining property. The property is valued by the claimant's witnesses at sums varying from 141,774l. to 154,810l., and by the Canal Company's witnesses at sums varying from 43,866l. to 49,680l. The compensation awarded by the arbitrator is 70,352l.

THE "Congregational Year Book" for 1889 states that on December 15 there were in England and Wales 4,542 Congregational churches and mission stations, affording accommodation for 1,630,000 persons. In Scotland there are 101 churches; in the Channel Islands, 11; in Ireland, 23, with 95 evangelistic churches; and in the British colonies, 717.

MR. J. C. HALLIDAY, gas-lighting and ventilating engineer, and the inventor and maker of the "Clapton" light, has left London for 12 Grainger Street, Newcastle-on-Tyne. In the interest of the gas-consuming public, it may be noted that the saving in gas bills where the "Clapton" light is in use is computed for the year 1888 at no less a figure than 31,437l. 10s., and that the total saving effected since its invention by use of the "Clapton" light amounts to 100,000l. Mr. Charles Bell,

of Dashwood House, a well-known architect, was so pleased with the illumination when he saw it first used, that he has adopted it since in buildings erected by him, as giving the best illumination by gas with the fewest number of burners.

MR. E. H. SHORLAND, of Manchester and London, has just supplied his patent Manchester stoves to warm and ventilate the new ward of the Grantham Hospital. The architect is Mr. R. Adolphus Came, of London.

DURING the past twelve months the Wigan Coal and Iron Company (Limited), who employ 10,000 workmen at their extensive collieries in the district, have been engaged laying down extensive new steel works at Kirkless, the headquarters of the company. Previously, the company turned out a large quantity of wrought-iron, but the demand for that quality of the metal has of recent years fallen to a great extent, and steel has been utilised in its stead. It is estimated that 50,000 tons of steel blooms are consumed in Lancashire every year, and it is with the view of supplying this that the company decided to lay down new plant. This consists chiefly of four 15-ton melting furnaces, each capable of producing from 180 to 200 tons of steel per week, and it is estimated that the works will give employment to several hundred men. Operations have commenced at the works, which are illuminated by electric light.

MESSRS. JAS. DONALD & SON, ironfounders, Johnstone, have just delivered the first of four heavy castings, the total weight of which amounts to between 80 and 90 tons. The castings are for plate-shearing machines, and each "cheek" weighs upward of 20 tons. The work is for Messrs. Robert Harvey & Co., Parkgrove Ironworks, Glasgow. The machine when completed will cut 1½-inch steel-plates with a clip of 10 feet at a time.

AN award has been issued by Mr. Beadel, in the arbitration which recently took place between Mr. Richard C. Naylor, of Hooton Hall, and the Manchester Ship Canal Company, as to the compensation to be paid to Mr. Naylor in respect to about 121 acres required for the Ship Canal undertaking, and for the consequential damage to Hooton Hall and the adjoining estate. There was a further claim for certain foreshore rights, the existence of which were partly disputed by the Canal Company. The arbitrator awards in respect to the land taken and consequential damage the sum of 28,925l., and a further sum of 1,834l. if the right to the disputed foreshore can be sustained. For the foreshore about which there was no dispute the arbi-

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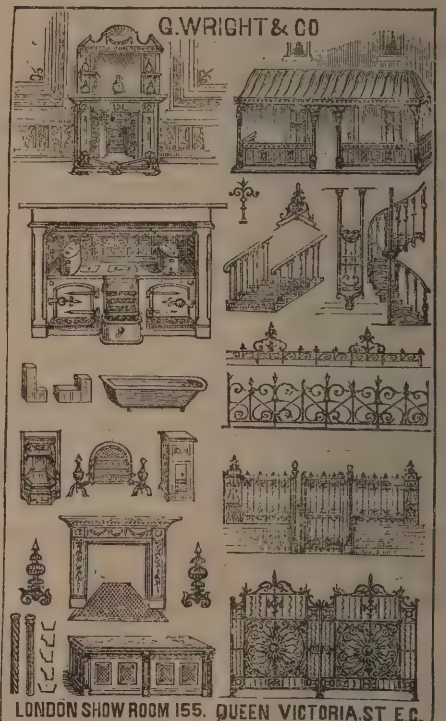
112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1½ inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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"ECLIPSE" PORTLAND CEMENT  
Quick setting; test 3 parts Standard Testing Sand, 230 lbs. per square inch; 28 days. The finest, most plastic, best sand carrying, and cheapest Cement in the market. Specially adapted for laying encaustic tiles, making joints in sanitary pipes, internal stucco, concrete foundations, &c.

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NATURAL PORTLAND AND ROMAN CEMENTS, HYDRAULIC  
BLUE LIAS LIME, Plaster of Paris, Keene's and Parian Cements,  
Bricks, Roofing Tiles, Drain Pipes, Paving Tiles, Bath Bricks,  
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**"THE GOLD MEDAL RANGE."**  
WORKS, ROTHERHAM. Estab. 1854.



trator awards 2,578/. In the evidence before the arbitrator the lowest sum placed on the value of this property by the claimant was 82,811/., of which 4,251/., was in respect of the disputed foreshore.

#### REMOVING GRANITE RUST.

M. DETAIN sends to *La Semaine des Constructeurs* one of his sensible letters on granite, or rather on causes of discoloration of granite by rust, and the methods of preventing and removing this discoloration. In most granite countries a certain amount of iron is scattered through the rocks beneath the surface of the earth, usually in form of sulphide, crystallised in the well-known cubical, gold-coloured particles of iron pyrites. The crystals of pyrites occur in many other rocks besides granite, more particularly, perhaps, in slate and coal, and are frequently supposed to be gold. Wherever they occur, they decompose on exposure to the weather, leaving ultimately a free oxide of iron, which is washed by rain over the surface of the stone. Many white or mottled marbles also contain iron, which slowly imparts to the surface, under the action of the weather, a warm burnt-sienna colour. This is not a serious disadvantage to marble, but in granite the iron stain combines disagreeably with the natural colour of the stone, and granites containing iron particles should be rejected. According to M. Detain, the French granites of a dark grey colour are rarely, if ever, affected by rust. Those with white ground are more apt to contain iron, but are tolerably safe; while those with pink or red ground are almost sure to rust. With us, red granites are no more subject to rust stains than others. There are some red granites which contain iron, but there is at least an equal number of grey and white stones with iron particles in them, and as these soon assume an unpleasant appearance on exposure, new granites should be tested. The best test, and one which cannot be too strongly recommended to architects who have occasion to try a new stone, consists in a visit to the quarry, where its merits and defects may, with a little care, be ascertained with certainty; but washing the suspected stone with muriatic acid, and allowing the acid to dry on, will often bring out the colour of iron. Singularly enough, the same means answers for removing the rust stains which have already formed on a stone. The muriatic acid readily dissolves the rust, and if it is then washed off with plenty of clear water, the

stain will disappear until the atmospheric influences have produced a new coat.

#### BUILDING MATERIALS IN AMERICA.

WHILE our lumber districts are being rapidly depleted, says the *Architectural Era*, not only by the increasing demand for lumber, but also by means of the destructive forest fires which occur with such alarming frequency, it is a source of consolation to reflect that we shall not lack for building material as long as the earth remains. The vast resources of America's stone quarries may be said to have only just begun to be developed. There is probably no computing the value and extent of the wealth which still lies undiscovered in the earth in the form of granite, sandstone, marble, and perhaps some new and more beautiful building stone than any now known. There are probably few localities in this country which do not possess somewhere in their vicinity some kind of stone suitable for building purposes. While we deeply regret the increasing scarcity of lumber, and should be very sorry to see the predicted lumber famine realised, yet we should rejoice to see stone more largely used in the structures of the day. No material is so appropriate for churches, none so lends itself to the expression of that calm dignity and majestic repose required in ecclesiastical architecture, as grand and enduring stone. A more general use of stone as a building material would soon cause such a decrease in its price as to bring it within reach of the masses. Stone is the most satisfactory and suitable material for the construction of all public and heavy buildings.

#### STONE-CUTTING BY WIRE ROPE.

SOME months ago we made mention, says *Stone*, of a foreign device for cutting stone by means of steel bands or wire rope made to run around pulleys like a band-saw. Since that time we have been investigating the matter more fully, and are now in possession of full detail drawings and specifications of all that pertains to the apparatus. As soon as translations can be made from matter in hand and cuts prepared, we will give all information extant upon this subject. Primarily, it is well to say that the results contemplated are much more extensive than was suggested in the original articles published by us. Not only stone-cutting but stone-quarrying in all its

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Corsham Bath Stone Co., Ltd. Stone Bros., Limited.

G. W. Railway Mileage Station,  
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MANUFACTURERS AND PATENTEES—

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branches, where cutting is of use, is contemplated. It is intended for horizontal, vertical, or angular cutting. By cutting a channel through the bed of a quarry, horizontal cuttings of any length may be made, subsequent to which the machine may be adjusted for vertical cutting. These may be regulated to any angle. In such cases it is entirely possible to cut vertically any direction into the rock and then horizontally and, if desired, through to the top again. While it might not be necessary to do such work at any time, the somewhat fantastic illustrations show us quarry with a central source of power and cords running in all directions, some of which are making vertical, others horizontal cuttings; again, others which are transmitting power for the purpose of elevating and conveying stone blocks. Again, there are those which are cutting the quarries into various finished forms. All of the details appear to have been worked out in a thorough and practical way. The means of transmission of power when under cover is by hemp rope, otherwise wire rope. The details of the carriers and tighteners are worked out in the most complete manner. Hemp rope as a means of transmitting power under cover is now coming very generally into use in this country, and has long since been very generally employed in other sections. One of the interesting illustrations of the use of wire rope in cutting is the gangs where large blocks are cut into many parts. The details, while most carefully worked out, are of the simplest character. In the cutting from the quarry the waste is only about one-half of one per cent., and as by its use it is possible to almost entirely do away with blasting or drilling, the general saving is apparent. It is said that the work accomplished is fifteen times greater than possible by old methods.

#### THE BLUE-BRICK TRADE.

ON Thursday in last week a meeting of the blue-brick makers of South Staffordshire, Warwickshire, and Worcestershire was held at Birmingham. Mr. Putress presided; and among the firms represented were the Haunchwood Brick Company (Nuneaton), Hathern Brick Company (Loughborough), H. Doulton & Co. (Rowley), Wood & Ivery, Limited (West Bromwich), Ketley Brick Company (Kingswinford), Barrows & Barrows (Great Bridge), Hockley Hall Brick Company, Limited (Tamworth), Roberts & Cooper (Brierley Hill), Stanley Brothers (Nuneaton), W. Morris (Oldbury), Partridge & Guest (Rowley), J. W. Howlett (Oldbury), Cakemore Brick Company (Rowley),

S. J. Sadler (Oldbury), P. and S. Wood (Tipton), J. Whitehouse. Mr. Webster (Messrs. Wood & Ivery) was appointed hon. sec.

The Chairman said that a circular had been sent out to all the blue-brick makers. Although they had in previous years held similar meetings to the one now summoned, and nothing satisfactory had resulted, that was no reason why the present one should not lead to something beneficial. He thought they were all agreed that prices were too low.

Mr. Rogers (Messrs. Stanley Brothers) said he thought the present time was a good one for advancing prices. In the Warwickshire district the price of fuel had increased 25 per cent., and consequently makers could not afford to sell at the old prices. There was a movement apparent for a general advance of prices.

Mr. Aglow (S. J. Sadler) said his firm was quite anxious for an advance to take place, but their experience of those meetings in the past had been that, after it had been decided to advance prices, they found some of their neighbours underselling them. Consequently they did not feel inclined to take any decided action at present, but would heartily co-operate with the general body of makers in securing an advance.

Mr. Hodson (Loughborough) said his opinion was that their trade had been damaged by the middlemen, who had effected the decrease in prices. The question he asked was whether any of them were making a profit after receiving 5 per cent. for the money invested in their works? He was quite sure blue bricks ought to go up. He thought if the blue-brick makers would strike it would have the effect of sending up prices. The time had come when prices would have to be increased, but such increase could only be maintained by the whole of the brickmakers standing together.

Mr. Webster said that as soon as the price of slack went up his firm issued a circular stating that the price of bricks would have to be increased. They received replies to that circular from the merchants stating that they were the only people in the trade who had increased prices. If the brickmakers would remain firm he thought there would be no difficulty in maintaining prices.

Mr. Hamblett said his firm had announced a rise, but it was no use doing it unless all the makers did it.

Mr. J. W. Howlett supported the proposition for an advance.

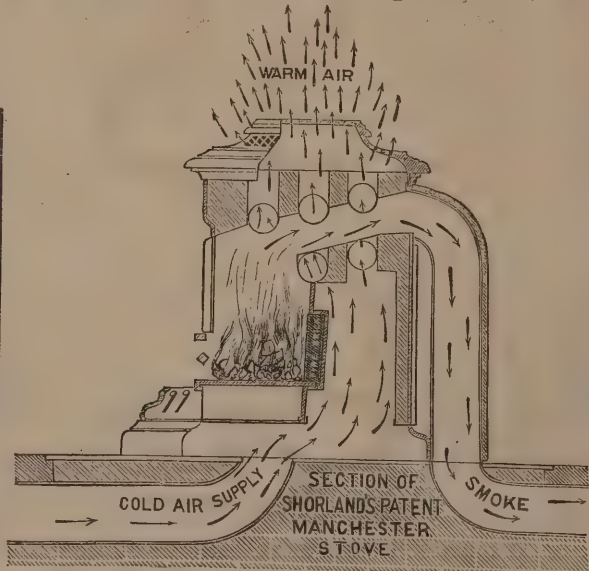
The Chairman suggested that they might make an advance of 10 per cent. on best bricks, 20 per cent. on odd-side stuff, and 5 per cent. on common bricks.

After some further discussion, on the motion of the Chair-

### SHORLAND'S PATENT COMBINATION OPEN FIRE-PLACE MANCHESTER STOVE.

With Ascending or Descending Smoke Flue.

Made in Various Designs and Sizes. Thousands in Use.



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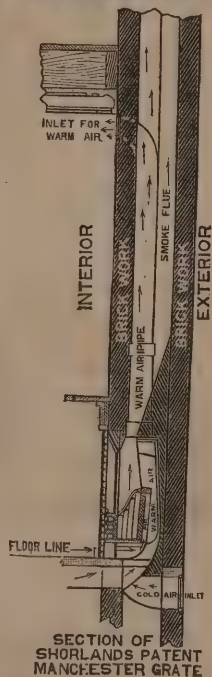
Very largely used in HOSPITAL WARDS, for which the draught arrangement, as now shown, is specially suited. As now being supplied throughout the Hospital Wards of the New Workhouse Infirmary, Birmingham, Oldham, &c., &c. Drawings, Prices, Testimonials, &c., on application.

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Contractor to Her Majesty's Government, the Bank of England, &c., &c.  
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man, seconded by Mr. Whitehouse, the following resolution was passed:—"That this meeting, comprising the principal blue-brick makers of South Staffordshire, Warwickshire, and Worcestershire, hereby unanimously agree to advance the price of blue bricks 10 per cent, such advance being entirely due to the increase in the price of fuel and other material."

An amendment proposing to refer the question to a committee to draw up a minimum list of prices was rejected.

Mr. Hodson proposed a resolution to the effect that all the manufacturers should circularise their customers of the advance, and the circular should be signed by the hon. secretary. Mr. Smart seconded the motion, which was carried.

A vote of thanks to the chairman terminated the meeting.

#### THE FORTH BRIDGE.

NOTWITHSTANDING the frequent stoppage of labour in consequence of stormy weather, rapid progress has been made recently at the Forth Bridge; indeed, so materially has the work been advanced that the gigantic structure is now assuming a shape which indicates that the bridge is within measurable distance of completion. The great centre gaps which require to be spanned are every day being reduced in length, and to the non-engineering eye this part of the works now presents less difficulty of accomplishment than it may have done a few months ago. Never anticipating any serious obstacle in the building of the spans, the engineers are finding this section of the work more simple than many of the previous stages. Both on the Queensferry and Fife sides bay No. 3 has been completed, and No. 4 commenced too. As has been the case throughout, the work on Inchgarvie is behind that on either side. At the sound end of the island, however, the third bay is pretty well advanced, while another month will bring the north side as far forward. Some idea of the limited extent of work yet to be undertaken may be gathered from the fact that during the months of August, September, and October material was erected on the three piers at the rate of 2,000 tons per month, and that only 9,000 tons are now required to finish the work. From this it is calculated that should the weather not interfere, and the workshops at Queensferry be able to cope with the demands made upon them, the bridge proper may be completed by the beginning of May next. In the sheds on the south side, night and day shifts are being constantly employed, but only one staff of men is found necessary on the erections.

The 30th October is the date fixed for the entire completion of the bridge, and it is confidently expected that everything will be in readiness by that time. While the bridge is in this forward condition, the approach railways on each side are also being pushed rapidly forward, large staffs of men being employed by the contractors. The most serious engineering difficulty, perhaps, which has been encountered in connection with the railways is between North Queensferry and Inverkeithing, in consequence of the great masses of rock which exist there. At one point the cutting required is so deep that it has been resolved to construct a tunnel.

#### THE HAMILTON IRONWORKS, GARSTON.

AMONGST the oldest-established firms in the country engaged in the manufacture of iron roofs, buildings, and constructional wrought and cast ironwork, together with various specialities in galvanised and corrugated iron, iron fencing, gates, and ornamental railing, is the firm of Messrs. Francis Morton & Co., Limited, of Liverpool. The gradual extension of their business has necessitated constant enlargement of premises, and they have added to their Liverpool establishment extensive works situated on the Mersey, at Garston, a suburb of Liverpool. These works cover more than 10 acres, and comprise an extensive range of lofty, well-lighted buildings, with private dock and railway siding accommodation. The north side of the enclosure is occupied by a shop, 600 feet long by 120 feet wide, for girder, bridge, and roof-building purposes, which contains a long range of smiths' hearths and a very complete plant of tools, embracing the latest improvements in punching machines, steam hammers, rivetters, bending rolls of various power, planing machines, &c., a special feature being multiple punching machines, one of which will at one stroke punch forty-eight holes through a plate  $\frac{1}{4}$  inch thick, the number of punches in use being regulated by the requirements of the work. Another machine will punch a multiple of holes from  $2\frac{1}{2}$ -inch pitch, and can be regulated to any pitch used in general work. The shop is traversed throughout its length by railway lines, and fourteen overhead gantries and cranes contribute to the convenience of erecting under cover a large extent of work. Adjoining this shop is one for tinmen's use, and a double-storey building used for templates and as setting-out floors, next to which come the drawing and general offices. On the opposite or south side of the spacious open yard is a series of shops fitted with plant for various classes of work, viz., the foundry,

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# CURE.



200 feet by 120 feet, with two cupolas inside the building and two outside. Here again are overhead travelling cranes, extending the whole width of the shop, with the usual arrangement of core-drying stoves, loam mills, and a dressing shop for finishing up the castings. In this foundry single castings up to forty tons weight can be turned out, and it is sufficiently commodious to allow of the metal being left to cool in the sand for a much longer period than is usual in the ordinary way, an advantage in securing good castings that has to be frequently sacrificed in the crowded-up foundries attached to some establishments. Adjoining is a brass foundry, and subsequently a fitting and turning shop, 200 feet by 120 feet; a smiths' forge, a building 200 feet long, containing fifteen fires; saw-mill and painters' shop, a two-storey building, 155 feet by 40 feet, the upper part of which forms a pattern shop, the basement being set apart for wood-working machinery; two large establishments filled with machinery for the manufacture of patent iron telegraph poles; corrugating machinery shop, 155 feet by 80 feet; packing shop, 65 feet by 80 feet; and, on the east side, general stores and stabling for thirteen horses, which latter, however, are not needed, the firm having their own locomotive for haulage purposes, rails being laid on a complete system to each shop. The west side has a frontage of about 500 feet to the Mersey, being entered from that river by a private dock, which runs up into the open yard, and provides accommodation for vessels up to 270 feet in length. The dock is fitted with steam travelling crane for loading and discharging material. The motive power for driving the various machinery in the works consists of two 50 horse-power engines, a 16 horse-power gas engine, and considerable hydraulic power. The fresh water supply is derived from a covered reservoir in the yard, holding 160,000 gallons, distributed through the works by hydraulic ram. The London offices are at 9 Victoria Chambers, Westminster.

#### THE ASSOCIATED CARPENTERS AND JOINERS.

THE twenty-seventh annual report of the Associated Carpenters and Joiners, after referring to the trade disputes during the year, alludes to the improvement in trade, regarding which their expectations had been more than realised. The income for the year amounts to 6,155*l.* 6*s.* 6½*d.*, or an increase of 214*l.* 13*s.* 8*d.* over the income of the previous year. The gross expenditure for the year amounts to 6,324*l.* 15*s.* 0½*d.*, or a loss

of 169*l.* 8*s.* 6*d.* on the year's transactions, thereby reducing the funds on hand to 8,169*l.* 18*s.* 2*d.*, which, on a membership of 3,833, makes the Association worth 2*l.* 2*s.* 7½*d.* per member, or 4½*d.* less per member than last year. Of this sum 5,231*l.* 2*s.* 4½*d.* belongs to the trade fund, 2,660*l.* 6*s.* 9½*d.* to the sick, and 278*l.* 9*s.* to the idle fund, being a gain of 31*l.* 17*s.* 7*d.* to the trade, a loss of 388*l.* 1*s.* to the sick, and a gain of 186*l.* 14*s.* 11*d.* to the idle fund. The return of plant held by the Association, exclusive of books, &c., is estimated at 309*l.* 6*s.* 8½*d.*, making the total worth of the Association 8,479*l.* 4*s.* 10½*d.* The general secretary says:—Fortunately for us, although the amount paid on account of trade disputes is largely in excess of the sum which we have expended under this head during the past few years, there is little room for complaint on the part of our outside critics, since by far the largest amount of this sum has been spent not for the purpose of forcing wages up, but in preventing a few grasping employers from forcing them down in the face of a rising market.

#### THE PARIS EXHIBITION OF 1889.

AN influential and representative committee was formed a few months since in London, under the presidency of Lord Brassey, in order to assist the French authorities with their work, and to form a loan collection worthy of this country, which has played so important a part in the history of the means of transport, and which should supplement and complete the French exhibits of the same nature. This committee is affiliated to the French committee of organisation, and has for its vice-presidents Mr. T. Sutherland, M.P., and Mr. G. Findlay, manager of the London and North-Western Railway. It includes two sub-committees, the first dealing with means of transport by land, of which Mr. H. Oakley, manager of the Great Northern Railway, is chairman; the other taking charge of the means of transport by water, under the chairmanship of Mr. B. Martell, chief surveyor at Lloyd's Registry of Shipping. The work already carried out by these committees has assured a loan collection larger and more complete of its kind than has ever before been brought together. Among the great attractions which the Paris Exhibition of next year will offer, one of the principal will be the palace of the Liberal Arts. This building will be similar in design to the Fine Arts Palace, and will be chiefly devoted to the display of objects that will illustrate the development of artistic and commercial industries from the

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## GRIFFITHS' "PYRODENE" FIREPROOFING LIQUID

(NON-POISONOUS).

### Transparent Liquid for Rendering Woodwork Uninflammable,

Without altering its appearance, and where Painting is not desired, such as Wooden Fittings in Exhibitions, Churches, Pews, Matchboarding, Theatre Scenes, Wooden Stairs, Joists, Beams, Floors, Factories, Stables, Mills, &c., in fact, Structures of an inflammable nature of all descriptions. Acts as a priming for new Woodwork for Paint or Varnish. Also for rendering Theatrical and Ball Dresses, Curtains, Paper, Felt, Canvas, &c., perfectly uninflammable.

Griffiths' Liquid penetrates the pores of the wood. It lasts as long as the wood itself. It prevents Dry Rot and decay in house timbers. It does not crack, peel, or rub off.

It is perfectly innocuous and free from smell. It will keep any length of time. Any one can apply it. One gallon will cover double that of any other priming.

AND

All Woodwork in new houses should be fireproofed with this Liquid, the cost is so trifling in comparison with the preservation of the timber and freedom from risk of fire. If work is desired to be painted afterwards, Griffiths' Pyrodene Paint is best for the purpose.

## GRIFFITHS' "PYRODENE" FIREPROOF PAINT.

READY FOR USE. NON-POISONOUS. ALL COLOURS.

This Paint is manufactured for preservative and decorative purposes equally as for its FIRE-RESISTING qualities. The Fireproof Paint and Fireproofing Liquid is used at some of the principal Theatres in the United Kingdom.

#### RECENT TESTIMONIALS.

From Messrs. MAXWELL & TUKE, Architects, 29 Princess Street, Manchester: December 28, 1887.

DEAR SIRS.—We used your Paints in nearly the whole of the works for the Royal Jubilee Exhibition, and with very satisfactory results.

Yours truly, MAXWELL & TUKE.

To Messrs. Griffiths Bros. & Co., Dashwood House, London, E.C.

From S. C. LOWE & SON, House Decorators, 32 Cavendish Street, Stretford Road, All Saints, Manchester: November 22, 1887.

DEAR SIRS.—In reply to your inquiry, we, as one of the contractors for the painting Manchester Jubilee Exhibition, which closed on the 10th of this month, have pleasure in stating that both your "Aqual" Paint, and also your "Pyrodene" Fireproof Paint, have given great satisfaction. We found them work easily with a covering power of from 30 to 40 per cent. over ordinary paint. Although applied during intense frost, and having been subjected to an almost tropical summer, followed by the drenching rains of this autumn, they are as fresh in colour and have as firm a grip as when applied, and appear quite unaffected by the nine months' exposure. We consider them, therefore, well adapted for all work in any climate.—Yours truly, S. C. LOWE & SON.

To Messrs. Griffiths Bros. & Co., London.

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earliest times to 1878, the date of the last International Exhibition held in Paris. The most important section of this display will be an exhibition of the means of transport by land and water. The growth and development of railways, transport upon common roads, internal navigation by rivers and canals, everything connected with shipping, even the art of aerostation, will come within the limits of its comprehensive title. As regards the last-named subject, the great dome which forms the central feature of the Liberal Arts Palace will be devoted to the display of balloons and their accessories.

#### PERUVIAN RAILWAYS.

At the last meeting of the Civil and Mechanical Engineers' Society, a paper was read on the Oroya Railway, Peru, by Mr. W. Alfred Eckersley. The author, in commencing, chiefly alluded to recent Peruvian history, and the way in which, during unnatural inflation, money was borrowed in the most reckless manner for railways and other public works which were only half executed, when such a series of national reverses and disasters ensued as to almost paralyse the commerce and trade of the country. The natural resources of Peru, however, are so great that the author expressed the greatest confidence in the future prosperity of that country. Proceeding to describe the railway, he stated that the line was now open to Chichas, a distance of 87 miles from Callao, but until completed to Oroya, a further distance of 50 miles, the object of the line and development of the rich mineral and productive districts of the interior would not be accomplished. The present terminus is over 12,000 feet above sea-level, and is gained by an uninterrupted series of ascending gradients, the steepest being 1 in 25. The sharpest curve allowed is 6 chains radius, but in several places single and double back shunts have been found necessary. The river Rimac and numerous gorges are crossed by viaducts of the American pin-truss description, the spans varying from 91 to 205 feet, and resting upon lofty but spidery-looking iron piers, sometimes over 250 feet high, and the author seemed much impressed with the suitability of this description of ironwork for such work, and considered it far superior to rivetted structures. In making the surveys for the line, and also in constructing the viaducts, men and materials were slung along ropes across the lofty chasm, and much courage and energy must have been displayed, one of the largest of these

grand examples of engineering skill having been erected in four months. The author tested the viaducts with heavy rolling and stationary loads, and found them to be very satisfactory, the deflection at centre being generally less than 1 in 2,000 and the recovery perfect.

#### PROPOSED HARBOUR FOR DEAL.

A MEMORIAL was forwarded by the Deal Town Council on Monday to the Board of Trade in support of a proposal to construct a harbour at Deal. The memorial shows that Deal is without any harbour or shelter for ships or boats; that for generations a large part of the population has been engaged in nautical pursuits, but from the want of a harbour they were unable to engage in deep-sea fishing, and at certain times of wind and tide were unable to carry on their occupation at all as they could not launch from the beach; that through the decline of their occupation the race of Deal boatmen was likely to die out unless some steps were taken; that the harbour would open up import and export trade as well as deep-sea fishing, afford further communication with the Continent, and provide a safe refuge, and be of the greatest use from its position in connection with H.M. Navy, especially in the time of war, as a rendezvous for small cruisers, and as a coaling station and victualling depôt.

#### DURABLE MATERIAL FOR DAMP-COURSES.

A CASE was lately heard at Stratford before Mr. W. W. Glenny and Mr. B. Tabreim relative to material to be used for damp-courses, and which is of interest as bearing on the by-laws of Local Boards. Many professional men and builders were present at the hearing. Mr. John Jolliffe, builder, of Wanstead, was summoned by Mr. J. T. Bressey, surveyor to the Wanstead Local Board, for erecting a building in High Street, the wall thereof being without a proper damp-course of sheet-lead, asphalt, or slates laid in cement, or other durable material impervious to moisture, contrary to the by-laws of the Board.

Mr. W. Blewitt, clerk to the Local Board, said that the proceedings were instituted under the 15th by-law of the Wanstead Local Board, which provided that all damp-courses used in the erection of houses should be made of sheet-lead, asphalt, or slates laid in cement, or some other durable material impervious to moisture; and the point in this case was

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whether a substance proposed to be used by the defendant was a material calculated to be a proper damp-course. The by-law said "or other durable material impervious to moisture," and it must be quite obvious that a material might be used composed of either sheet-lead, asphalte, or slates laid in cement, impervious to damp, but at the same time not durable. The lead or the asphalte might be laid so thin that, though impervious, it would not be durable. The word durable by itself was meaningless; it should be read in this case with the context; and he would submit that if a material was used for damp-course which would not last as long as the substance in which it was placed, then that material would not be durable. The defendant knew that the Local Board had an objection to the material he proposed to use in this case, because he had before attempted to use a substitute to the material passed by the surveyor; nor had he forced on these proceedings in his own interest or in the interests of builders; it was certainly done on purpose for a test case, and was fought out for him by an enthusiastic supporter of the material.

Mr. Hume-Williams, who represented Mr. Jolliffe, said that was admitted, but it would not in the least affect the real question before the Court. He appeared there on behalf of Messrs. D. Anderson & Co, of 812 Old Ford Road, who manufactured this substance to the extent of several thousand feet a day. It was used all over the kingdom, and this was the first time that its efficacy and durability for the purposes of damp-courses had ever been called in question.

Mr. Bressey, the surveyor to the Wanstead Local Board, said he had held that position for twenty-two years, and since the model by-laws came into force in 1882, none of the substance proposed to be used by the defendant had been used in his district. The substance in question was impervious to damp, but was not in his opinion durable.

In answer to Mr. Hume-Williams, he said there had been considerable correspondence between him and Mr. Seckham Witherington, architect, with reference to this substance, which he (Mr. Witherington) specified for damp-courses. On March 8, 1888, he had a sample of it sent to him. It was proposed to use it for some houses then being built by Mr. Jolliffe, but those houses were completed with slates. He did not know if the slates were only used in that case, because there was a specific time fixed for the completion of the houses. In the next building this particular article, he understood, was put in in order to raise the point as to its durability. He did not analyse the sample which was sent to him, but he "put it before the fire

and smelt it." It was impervious to damp; he only objected that it was not durable. He had never tried Anderson's Asphaltic Felt. Within his experience walls with a damp-course did occasionally subside; they were liable to a slight settlement. In his district slates were used for damp-courses, two layers of slate in cement. There was first a layer of cement, then slates, a layer of cement, then slates, and another layer of cement, sandwiched in fact. If a wall subsided, the slates would crack at that particular place. Anderson's substance was pliable. Several kinds of asphalted felt were used. In his district about thirty houses a year were built, and in every case the damp-course used had to be approved by him. If different sorts of damp-course were used he would be caused some trouble. That, however, was not the reason for his objection to this stuff; his objection was because it was not durable. In its composition there was tar or pitch, and certainly heat would not improve it. He was desirous of keeping this asphalted felt out of his district, and if he succeeded it would save him a great deal of trouble.

Being re-examined by Mr. Blewitt, Mr. Bressey continued:— If a building in part subsided, any damp-course would break. It would, as he had said, save him trouble to keep this asphalted felt out of the district, and it would also save the occupiers of houses trouble, because with its use the house would set damp. He would not allow the use of this asphaltic felt because he tried a similar substance years ago and it failed. It was not possible to supply any test as to its durability. It would yield to pressure and would probably get half as thick.

Mr. Hume-Williams then read the correspondence on the subject of the use of Anderson's Asphaltic Felt with Mr. Blewitt, Mr. Witherington, and the Local Government Board, and dwelt at great length on the merits of the felt and the demerits of slate damp-courses. In the latter case the slates would crack, and so also in some cases would the cement, if there happened to be a small stone or pebble in the cement; and in a case of that sort the damp-course was not impervious to damp, nor was it durable. Dealing with the rough test of placing the asphaltic felt before the fire and smelling it, adopted by Mr. Bressey, Mr. Hume-Williams said that it was an insult to the Court to come and adduce that test as a scientific one; the case was really a test one, and he would point out, and desired to impress on the Bench, that the onus laid upon his friend Mr. Blewitt, who had to prove that the asphaltic felt was not a proper damp-course, but he had not taken the least trouble to support by independent testimony or scientific evidence the

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240	12,000	109	110	1,200	Cheap.	£110
360	18,000	162	110	1,000	Cheaper.	£140
480	24,000	220	110	1,000	Cheapest.	£165

Delivery: Chelmsford.

Foundation Rails and Packing extra.



individual opinion of his surveyor. It was a matter of vital importance to Messrs. Anderson & Co., for it would be idle to shut their eyes to the fact that if that prosecution succeeded, their reputation and the sale of this asphaltic felt was doomed.

Professor A. H. Allen, F.I.C., F.C.S., president of the Society of Public Analysts, consulting and analytical chemist, of 101 Leadenhall Street, E.C., and 67 Surrey Street, Sheffield, deposed that he had carefully analysed a sample of Anderson's Asphaltic Felt, and from the result of experiments he came to the conclusion that it was undoubtedly impervious to damp. [Mr. Blewitt intimated that its imperviousness to moisture was not disputed.] As to its durability he could only speak by analogy—that he had not lived long enough to be able to testify as to how long it would last. It was principally composed of pitch, and the Egyptian mummies were preserved in pitch. In this asphaltic felt there was 54 per cent. of coal tar oil, 28 per cent. of fibre, and 18 per cent. of sand. Each grain of sand was unalterably durable, but he would only treat the sand used here as an accessory. Practically there was two-thirds of pitch to one-third of fibre, and in use the fibre prevented that spreading of the pitch suggested. [A section of a wall, which Mr. Hume-Williams said had been immersed in a tank of water for eighteen months, was brought into the Court.] The felt used as damp-course in that section of a wall was asphaltic felt. The mortar used had a quantity of lime in it, but the lime does not injure the felt. Lime had a deleterious effect on lead; in fact, leaden pipes laid in mortar were found to be much depreciated.

In answer to Mr. Blewitt he said his opinion of this as a damp-course was formed by experiments with the constituent materials, not by experience of its use. Assuming that a damp-course of slates and a damp-course of this felt were used on the same wall, he would say both yes and no to the question whether one was as good as the other—there were atmospheric influences. For roofing purposes the felt would be less durable than slates. A double course of slates would be as good as the felt, but there was the possibility of the slates cracking. The pitch used for the Egyptian mummies was not an artificial pitch; it was a natural asphalt. "Watts's Dictionary of Chemistry" was an admirable compilation, but its definition of asphalt did not fit in with this asphaltic felt. That referred to natural asphalt; in commerce coal tar was used in asphalt.

Asked by Mr. Hume-Williams, he said he regarded asphaltic felt as both impervious and durable, and suitable for damp-courses.

Mr. W. Seckham Witherington said that he specified this asphaltic felt to be used in the building in question as the best to use for damp-courses. In his experience of thirty years he thought it was a material that would make a proper damp-course, and that it was a material impervious to moisture and durable. Its component parts, its flexibility, its application, its economy recommended it, and it would not break in a settlement in the building—it was plastic.

Questioned by Mr. Blewitt, Mr. Witherington said his experience of the felt extended over nine months. He had used another felt, but on receiving a sample of this at once saw its advantages. He would use this felt for one reason—because of the possibility of settlement. Last year work passed through his office to the extent of 120,000/ to 130,000/, and perhaps he had had some settlements; they could not be guaranteed against. Infinitely he preferred this asphaltic felt to lead. It would certainly be better laid in cement, but he would not put his clients to the expense of using cement. The asphaltic felt would be perfectly adequate in mortar alone.

Mr. Thomas Stone, architect, of Great Winchester Street, said that from his experience of thirty-five years he now always specified asphaltic felt, because he thought it durable and impervious to damp. Some slates he could put his fingers through. His experience of the felt only extended over a few months. He preferred the felt to asphalt.

William Gregar, builder, of Stratford, said that he had used tens of thousands of feet of the material. He had used it in public buildings in the parish. It was a durable material and impervious to damp.

In answer to Mr. Blewitt he stated he had used material of the sort twelve years ago, but his experience of Messrs. Anderson's felt was but of nine months.

Mr. Hume-Williams was about to call other witnesses, but was stopped by the Bench, and Mr. W. W. Glenny, the chair man, said:—After hearing the evidence put before us, we must dismiss the case.

Mr. Hume-Williams asked for costs, but the Chairman said the Bench thought the Local Board had acted in perfectly good faith and would not give costs.

This decision, the only one possible to be arrived at, when brought to the test of judgment, will be of much benefit to the building trade, as it will protect honourable contractors and manufacturers from annoyance through arbitrary interference of local bodies, which, however well intentioned, too often results in petty despotism.

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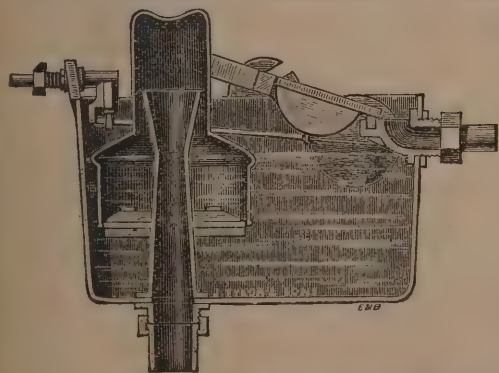
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BLOCKS IMMOVABLE.

Speciality: OAK and DARK OAK. Over a Million Feet in Stock, Thoroughly Seasoned.

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IN view of the many technical difficulties that surround the trade of the builder, it has been decided by a few professional gentlemen to organise and develop an institute whereby, with a system of co-operation, builders may gain many advantages from interchange of opinion and unity of interest. The objects are to found an institute for the technical assistance of builders, by which they may be able to obtain not only practical advice, but also efficient assistance in every branch of work appertaining to a builder's office. It is proposed to give members the benefit of a central London address where letters can be received, and calls in town and business interviews arranged, a subscribers' general room being set apart for that purpose, and provided with books of reference, directories, and building periodicals, and where information and the best professional advice regarding the various building technicalities and problems will be given for one year from date of entry.

**WESLEYAN CHAPEL AND SCHOOL EXTENSION.**

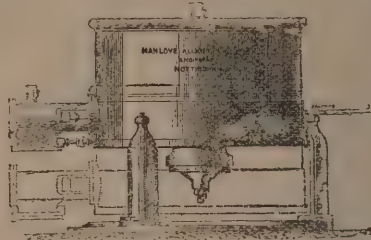
SITES have been secured in Woodhouse Lane and Roundhay Road, Leeds, for the erection of Wesleyan chapels, and it has been decided to commence operations as soon as possible, and that buildings should be erected at a cost of about 12,000/. On the Woodhouse Lane site it is intended to build a chapel to seat upwards of 900 persons. Schools will eventually be added. In Roundhay Road the schoolrooms will be built first, but, until the chapel is added, they will also be used for worship. The schools at each place will accommodate some 500 children. Seats will be provided for about 750 persons in the Roundhay Road chapel.

**PATENT RAISING GEAR FOR PENDULUM HYDRO-EXTRACTOR.**

AN important improvement in hydro-extractors or centrifugal machines has been patented by Messrs. Alliott & Haughton, and is manufactured by Messrs. Manlove, Alliott & Co., Limited, Nottingham, the well-known makers of steam laundry machinery. This improvement relates especially to that class of hydro-extractor or centrifugal which has an engine attached underneath the machine, and is suspended upon rods. It has

been usual to construct a pit under such machines for the purpose of getting underneath them to examine the engine, and in cases where the floor has been constructed of fireproof material, or for other reasons it has been impossible or inconvenient to make a pit to obtain access to the under side of the machine, it has been necessary to turn it over on its side for examination. Both these methods have been found to be inconvenient, and this improvement is designed to get over these difficulties. By a simple modification of the suspending arrangements, the machine can be rapidly lifted to a sufficient height to allow any one to get underneath it to examine the working parts. The engraving shows the machine raised up for this purpose, the dotted lines indicating the ordinary working parts.

The machine is thus seen suspended on rods, and with self-contained engine. It has been adopted in many places where



it would have been difficult to employ any other type of machine. The fact that it requires practically no foundation, may be set down almost anywhere, even on upper floors, and requires only a steam-pipe to connect to it, makes it an extremely convenient type in many instances. It will be seen that with a machine of this type the working parts of the engine are below the pan, and that it has consequently been necessary always to make a small pit, or to cut a hole in the floor to enable a workman to get below to conveniently examine the engine and moving parts. In a few cases where the floor has been constructed of fireproof material, or where for other reasons it has been impossible or inconvenient to make a pit to obtain access to the under side of the machine, it has been necessary, as before said, to turn it over on its side. The workmen do this as seldom as possible, and the engine is consequently run too long a period without examination or adjustment. To get over these difficulties, the arrangement shown in the woodcut has been devised and patented. It will be seen

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that the suspension-rods are made with a screw thread along their whole length, and the vibrating joint in the foot of the pan forms a nut fitting the long screw. The upper end of the suspension-rod or screw has a square end which may be turned by a handle or spanner; by this means the machine can at a moment's notice be raised up about 18 inches, or a sufficient height to enable a man to comfortably examine the working parts. Only one spanner is usually supplied with the apparatus, but if required two more can be furnished, so that three men could work all the three screws simultaneously. The device needs no further explanation. It is extremely simple, and will recommend itself to any intending purchaser who cannot conveniently obtain access to the under side of the machine in the ordinary way.

#### MESSRS. LAIRD'S WORKS, BIRKENHEAD.

A NEW boiler shop has recently been erected in Beaufort Road, at the north end of the Great Float, Birkenhead, for Messrs. Laird. This new addition to the large works at present owned by the firm has been constructed in order to meet the changes which have taken place in boiler-making, consequent on the increase of pressure and other causes. It is situated on the land set aside many years ago by the late Mr. John Laird for this or similar purpose, and occupies about 2 acres of ground adjoining the well-known Wirral Foundry of Messrs. G. Bayliff & Son. It is approached from the railway system on the Dock Board's lines by the Beaufort Road siding, by which material is delivered direct on the railway trucks. The shipment of boilers will be effected along the same railway to the large crane on the margin of the West Float, which is now being strengthened to lift weights up to 90 tons. The area covered by the buildings of the new boiler shop is about 6,000 square yards. The building consists of four parallel bays or sheds, so that practically they form one workshop between Beaufort Road and Corporation Road. The main shop for heavy work and for erecting the boilers is in the centre, and is 286 feet long by 63 feet wide. Flanking this on the east side is the shed for receiving the plates and other materials, marking, drilling, and bending them. On the west side of the main shop is the shed for light work, at the south end of which are placed the annealing and other furnaces, with the boiler and engine by which the whole of the extensive machinery and cranes are worked. Still further to

the west and parallel to the other shops is the smithy, having provision for fourteen smiths' hearths, two furnaces, and numerous flanging fires, the blasts for the whole being supplied by means of a large fan driven by steam-power and conveyed thereto by underground pipes. Adjoining the smithy bay are the store-rooms, offices, and moulding loft, all affording ample accommodation. Rails are carried through the works direct from the Beaufort Road siding, whence it is connected with the whole railway system of the country. The machinery at present erected consists of a number of powerful machine tools of the most recent design and construction. The main shop is traversed by two each 50-ton overhead power-driven travelling cranes, of 50 feet span, with 30 feet lift, and one 40-ton power-driven travelling crane. Over the other sheds there are four other travellers to lift from 15 to 20 tons each. In the eastern shed is a very large machine for planing simultaneously the edges and butts of plates up to 28 feet long by 10 feet wide. In the same shed are large vertical plate-bending rolls, which bend plates cold up to 12 feet 2 inches wide, and  $1\frac{1}{2}$  inch thick. Plates have already been bent in these rolls with an area of 170 square feet, and weighing upwards of four tons. There are also two sets of horizontal rolls for smaller work. Under the main central shed is a boiler shell drilling machine for drilling the shells of boilers when put together as complete cylinders, and there is also a boiler back stay drilling and tapping machine moving through 20 feet horizontally and 10 feet vertically. Under the same shed there are two hydraulic rivetters, one of which makes perfect work of rivets  $5\frac{1}{2}$  inches long by  $1\frac{1}{8}$  inch diameter, weighing 3 lbs. each, and has rivetted a large boiler 18 feet 6 inches long by 15 feet 4 inches in forty-eight consecutive hours. The smaller machine has 5 feet 6 inches gap, and works at a pressure of 40 to 50 tons. There are three large, double-ended punching and shearing machines, to punch up to  $1\frac{1}{4}$ -inch holes through  $1\frac{1}{4}$ -inch plates  $23\frac{1}{2}$  inches from the edge, and to shear  $1\frac{1}{4}$ -inch plates  $25\frac{1}{2}$  inches from the edge; also a number of other punching vertical and wall-drilling machines, oval hole-cutting and twist drill grinding machines of various sizes, suitable for boiler-making and other purposes. The smiths' shop is complete with hearths, plate flanging fires, cranes, steam-hammers, and other appliances. The whole premises have a well-arranged system of gas lighting, and the Lucigen and Wells lights have been successfully adopted for the principal shop. The working plans for the sheds were prepared by Messrs. Lewis Hornblower & Sons, under the immediate

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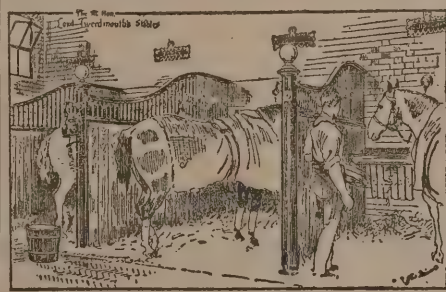
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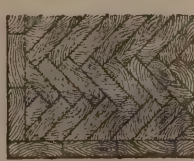
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GOLD MEDAL, Inventions Exhibition, 1885.



direction of members of the firm and Mr. Bevis; and the principal contracts for the buildings were carried out by the following contractors:—Brickwork, by Messrs. A. Bleakley & Sons, of Birkenhead; iron columns and girders, by Messrs. Goodwin & Co., Motherwell Foundry, Glasgow; iron roofing, by Messrs. Morton & Co., of Liverpool; Belfast roofing, by Messrs. D. Anderson & Co., of Belfast; painting, by Mr. Wm. Male, of Birkenhead; glazing, by Messrs. Lackland & Co., of Birkenhead; furnaces, by Mr. C. Snape, of Birkenhead.

### ELECTRIC LIGHTING IN LONDON.

ON Friday last two important meetings of electric supply companies for the metropolis were held.

The Earl of Crawford and Balcarres presided at the meeting of the London Electric Supply Corporation (Limited). His lordship stated that they took over the installation at the Grosvenor Gallery in 1887, there being then about 11,000 lamps. The directors of the previous company spent a considerable sum in order to place their dynamos and engines in a very advantageous position; and they contracted with the engineer to supply dynamos sufficient to give the current to 20,000 lights. It was afterwards found, when the two machines were put into position, that the nominal efficiency of 20,000 lights could be safely exceeded, and the present company came into possession of two dynamos capable of giving 30,000 lights. In addition to that there was a system of engines which was very complete, but the engines were not quite sufficient for the large amount of work demanded from them at present. They had purchased a large system of overhead mains—cables for conveying the current from the generating station to the houses of the consumers. A good deal had been said as to overhead mains, but the directors had every confidence in their system, as the best material was used and the work was efficiently done. To satisfy the Board of Trade as to the efficiency of their wires they took one down which had been up for three years and seven months, and after it had been thoroughly tested in the presence of the officials of the Board of Trade, the latter acknowledged that it was in perfect condition. At Deptford they had a dynamo with an engine capable of giving 25,000 lights, and they had every reason to hope that that would eventually be equal to supplying 30,000 lights at least. They had also arranged for another dynamo of 25,000 lights. They would eventually have a capability of 150,000 lights with a

reserve power of 100,000 lights. He thought he might state that they had the whole circuit of London open to them. The only question was how much per mile they were to pay, and he thought they might trust the directors to arrange for that as cheaply as possible. They had applied for provisional orders, which practically embraced more than half of the metropolis. They had asked for powers to deal with the streets in 24 different localities, under the jurisdiction of as many local authorities.

The meeting of the Metropolitan Electric Supply Company (Limited) was held, with Sir John Pender in the chair. He informed the shareholders that the company took over from the Whitehall Company the important works and installation established at Whitehall Avenue. That station, which was of about 10,000 light capacity, was opened on the 1st of October, and the directors had hoped that the full capacity would be taken up in seven or eight months. Instead of that the full lighting capacity had been already taken up. In about two months orders were booked for about 9,000 lamps, and the mains for connecting them were being laid as fast as possible throughout the whole of the Charing Cross district. He had been informed by Mr. Gordon that the guaranteed revenue from the contracts made from the Whitehall works was 13,500*l.* a year. Other contracts were expected to increase that amount by 1,000*l.*, and after allowing for the working expenses and 10 per cent. for depreciation, a profit was expected to remain of 8,500*l.* a year, the capital represented by the Whitehall works being not much more than 40,000*l.* The buildings at Sardinia Street were in hand, and that station would be one of the most important in London. It would embrace the residential property about Bloomsbury, and the shops, newspaper offices, banks, &c., in Holborn, Fleet Street, and east Strand. It would have altogether 50,000 lights, and, as far as they could judge, it would not be long after the installation was completed before it was fully occupied. The machinery for that station had been ordered from the Westinghouse Company, and it would shortly be delivered. That company had put down in America 116 installations, all of which had been successful. They were inviting tenders from English contractors for another installation. He thought they would thus have the benefit of what he might call "contractors' competition." Only ten years ago the electric light was a laboratory experiment, but its use was now becoming almost universal. It was not more than 25 years ago that submarine telegraphy was first introduced, but 40,000,000*l.* was now invested in that enterprise. They, therefore, did not

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know to what extent electricity could be carried; but he felt confident that the electric light was to be the light of the future, though in other directions there would be a large field for the use of gas. The company also took over from the Whitehall Company the extensive and valuable property, the Waterloo Bridge Wharf, which was admirably adapted for supplying the whole of the Strand district, and which could take the machinery required for working 150,000 lamps. That, he thought, would be, perhaps, the largest installation on their system. Before another year was passed he hoped that that installation would be in active operation. He hoped that the great experiment now being tried by the Grosvenor Gallery combination would prove successful, for, if so, he believed it would be a very remarkable step in electric lighting progress. In the case of their own company, however, they had thought it wiser not to put all their eggs in one basket, and had so placed their different installations that they could work them collectively or separately. Since August the directors had secured several other sites for works, among others two for lighting the City proper and the Marylebone district. With reference to the Strand district, they had secured a monopoly of the lighting of the new Salisbury estate, consisting of Salisbury and Cecil Streets. They had given notice of a Bill in Parliament for powers to carry on the works for St. James's, Westminster, St. Martin's-in-the-Fields, and Waterloo Bridge. That would include the ground covered by the provisional order obtained last summer, but not confirmed by Parliament. Notices had also been given for four provisional orders for supplying mid London, north London, south London, and west London. Altogether they considered the prospects of the company very satisfactory.

## PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Cassell, Consulting Patent Agents, 43 Southampton Buildings, Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

## APPLICATIONS FOR PATENTS.

18269. James Lisle and Ben Lisle, for "An improved draught and weather excluder for the bottom of doors, windows, &c." December 14, 1888.

18294. Edwin Sydney Strange and John Clayton Austen,

for "Improvements in the construction of smoke extractors, exhausters, ventilators, and the like." December 14, 1888.

18297. Ebenezer Brown Hill, for "Improvements in gas brackets." December 14, 1888.

18308. John Henry Abel, for "A new and improved automatic door closer." December 15, 1888.

18333. Florence Welding, for "A novelty in house decorations." December 15, 1888.

18346. Richard Rowbotham, for "Improvements in ash-pans and dust-preventers for kitchen and other fireplaces." December 15, 1888.

18351. James Roach, for "An improved buddle for mining purposes." (Complete specification.) December 15, 1888.

18352. John Tate Williamson, for "An improved fastener for shaky windows." December 15, 1888.

18376. William Watson, for "Attaching the cords to window sashes, so that the cords can be attached and renewed, without removing the sashes from the frames." December 17, 1888.

18386. Joseph Cavargna, for "Improvements in charcoal-box irons in downward draught and grate thereof." December 17, 1888.

18388. Strethill Harry Wright and Richard Bate, for "Improvements in or connected with flushing cisterns for water-closets and urinals, also applicable to other purposes where it is required to regulate the supply of liquids, and then discharge a given quantity." December 17, 1888.

18443. Gilbert Samuel Tonks, for "Improvements in the construction of bakers' ovens." (Complete specification.) December 18, 1888.

18463. Joseph Hall, for "Improvements in kitchen-range bars." December 18, 1888.

18482. George Schuck and Henry Rudolf Schuck, for "Improvements in artificial stone." December 18, 1888.

18568. Charles Henry Beloe, for "Improvements in and connected with the purification of sewage and other foul liquids." December 19, 1888.

18570. John Baptiste Papier, for "Curing smoky chimneys and ventilating rooms and other similar places." December 19, 1888.

18606. David Howarth, for "Loose lip-and-basin trap, with pipe for bath, lavatory, or sink." December 20, 1888.

18607. John William Cooper, for "An ash-pan or dust-box for kitchen fire-ranges or other similar purposes." (Complete specification.) December 20, 1888.

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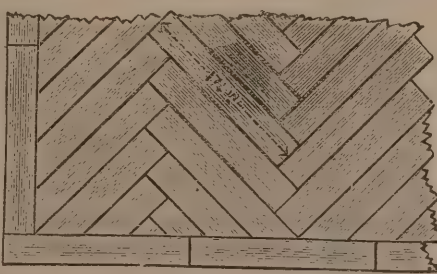
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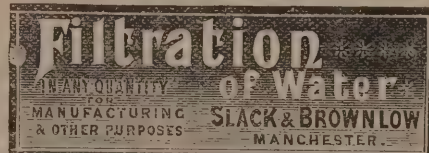
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18624. James Gray Connell and John Gordon, for "Improvements in valve apparatus for water-closet and other apparatus." December 20, 1888.

PROVISIONAL SPECIFICATIONS ACCEPTED.

14158. David Clohsey, for "Improved means for under-cutting or forming dowel-holes in wood, stone, metal, or other material." October 2, 1888.

15745. John Porter, for "Improvements in tops for chimneys and the like." November 1, 1888.

15793. William Logan, for "Improvements in and appertaining to portable and other hearths, and in blast apparatus therefor." November 1, 1888.

16011. James Shepherd, for "Improvements in treads for stairs, steps, landings, and floors." November 6, 1888.

16045. Walter Thomson, for "Improvements in door-knobs and in affixing the same to their spindles." November 6, 1888.

16185. Arthur James Smith, for "An improved apparatus for dressing white lead and other colours." November 8, 1888.

16210. Melchior Szabo, for "Improvements in kitchen-ranges." November 8, 1888.

16468. Oliver Phalps, for "Improvements in skylights and ventilators, applicable also to compass binnacles for use on board ship." November 13, 1888.

16708. Samuel Richardson, for "Improvements in revolving brush machine for street-scavenging purposes." Nov. 17, 1888.

16811. William Joy, for "Improvements in apparatus for crushing and grinding cement, clinker, and similar matters, and for separating the finer from the coarser particles of ground cement, clinker, and similar materials." November 19, 1888.

17052. Joseph Laming, for "An improved cap or cowl for preventing down-draughts in chimneys and ventilating-shafts and analogous purposes." November 23, 1888.

17257. William Cussaus, for "Improvements in colouring and ornamenting Portland cement for the manufacture of imitation, grained or figured marble mosaics, ornamental slabs, tiles and other forms, either in plain or in mixed colours." November 27, 1888.

17446. George Humphrey, for "Improvements in weather bars or thresholds for doorways and doorsteps." November 30, 1888.

17525. Burton Richard Phillipson, for "Improvements in the ventilation of drains and soil-pipes." December 1, 1888.

17665. John Lander, for "Improved apparatus for clearing drains." December 4, 1888.

COMPLETE SPECIFICATIONS ACCEPTED.

Notice is hereby given, that all persons interested in opposing the grant of a patent on any one of the undermentioned applications may, at any time within two months from the date of the official *Journal*, give notice at the Patent Office on the prescribed form of such opposition.

17674. Frank Porter Pyne and Ralph Hore Pyne, for "Improved closet-pan." December 23, 1887.

739. Benjamin Stuart and Harry Hanwell, for "Improvements in roofing tiles and hanging tiles." January 17, 1888.

1764. Reginald Stanley, for "Improvements in ovens or kilns for burning bricks, tiles and other articles." February 6, 1888.

1980. Matthew Henry Heys, for "Improvements in and relating to the manufacture of lime and of natural and artificial cements." February 9, 1888.

2380. David Williamson and Robert Williamson, for "Improvements in or relating to the warming and ventilating of rooms, buildings, and the like." February 17, 1888.

2803. John Brimton and Lewis Griffiths, for "Improvements in the manufacture of artificial stone." February 24, 1888.

5667. John William Anger, for "Improvements in fanlights and ventilator openers." April 17, 1888.

PATENTS SEALED, DECEMBER 21, 1888.

16877. Hiram Stevens Maxim, for "Intermittent water discharge, applicable to the washing out of drains, water-closets, and to similar purposes." December 8, 1887.

2199. Francis Joseph James Gibbons, for "Improvements in hanging centre plates for fanlights, applicable also to other analogous purposes." February 14, 1888.

2886. Francis Joseph James Gibbons, for "An improvement in sash pulleys for windows, applicable also to pulleys for other purposes." February 27, 1888.

10913. George Davis, for "Improvements in drain traps." July 28, 1888.

12589. Henry William Joseph White, for "Improvements in windows and other fasteners, specially applicable to sashes, basements, doors, and for similar purposes." Sept. 1, 1888.

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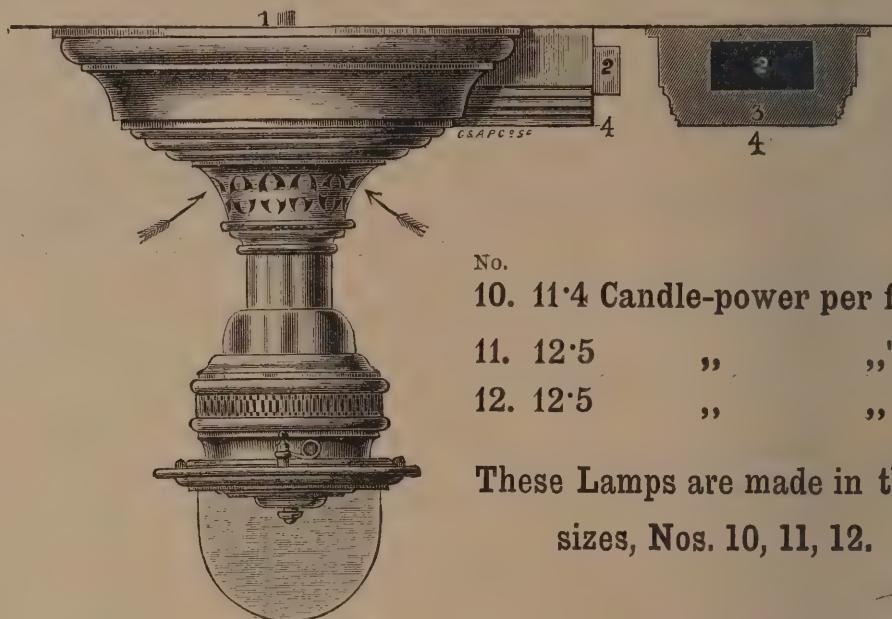
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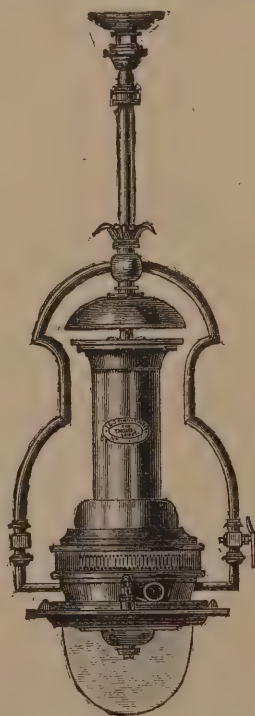
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# INDEX.

## Articles:—

American Architectural Museum, 268  
 Ancient Architecture and Sculpture, 175  
 — Lights, Covered Windows, 281  
 — Monuments, Preservation of, 150  
 — Scottish Architecture, 137  
 Antiquity in America, 369  
 Architects, Royal Institute of British—  
 Building Control in Paris, 339  
 By-Laws, 266  
 Examinations, 339  
 Musical Requirements in Church Planning, 351  
 President's Address, 259  
 Scientific Masonry Prizes, 339  
 Architectural Association—  
 Conversazione, 209  
 Irish Architecture, Dec. 7  
 President's Address, 237  
 Symbolism, 351  
 Theory of Arched Structures, 287  
 Victoria and Elizabeth, 266, 274  
 Architectural Drawings, 11, 85  
 Art and Culture, 313  
 — as a Profession, 302  
 Art Congress in Liverpool—  
 Applied Art, 327, 333  
 Architecture, 324, 331  
 Municipal Section, 335  
 Museum Section, 327, 336  
 Painting, 324, 338  
 Position of Art in England, 318  
 Programme of Arrangements, 307  
 Sculpture, 325, 332  
 Art, Study of, 263  
 — Training for Jewellers, 83  
 Baptismal Fonts, 162  
 Bath, Arms of, 10, 27  
 Bayham Abbey, 115  
 Birmingham Architectural Association, 336  
 — School Buildings, 268  
 — of Art, 159  
 Bisham Abbey, 101  
 Bombay Municipal Buildings, 49  
 Boyle & Son, Limited, Messrs. Robert, 312  
 British Archaeological Association, 91, 119, 135, 144  
 Brown, C.E., the late John, 139  
 Brown Studies, 365  
 Builders' Benevolent Institution, 343  
 Building in Edinburgh, 252  
 — Regulations in Glasgow, 252  
 Canterbury Cathedral, 73  
 Cantor Lectures, 21, 33, 43  
 Cave Architecture, 353  
 Channel Tunnel Works, 94  
 Church House, 13  
 — of St. Mary-le-Strand, 279  
 — Plate in Warwickshire, 100  
 Cirencester, Antiquity of, 105  
 Cistercian Abbey, Louth Park, 11  
 Colour Blindness, 152  
 — in Ornamental Design, 220  
 — Theories and Practical Experience, 367  
 Competition for Commissions, 199  
 — St. George's Baths, 9  
 — the Solicitors' Library, 13  
 Construction, Progress in, 293  
 Coventry, Leaning Steeple, 178, 200, 251  
 — St. Michael's Church Tower, 251  
 Crystal Palace Scholarships, 65  
 Curriculum for Architectural Students, 152  
 Cyprus, Excavations in, 181  
 Decoration in England, 21, 33  
 — of a Dome, 165  
 Decorative Handiwork Exhibition, 226  
 Design and Colour in Textile Fabrics, 219

## Articles—continued.

Design, Originality in, 308  
 Dublin, Dangerous, 224  
 Danlone Cathedral Restoration, 132  
 Danfermline Abbey, 150  
 East Shefford Old Church, 177  
 Edinburgh Architectural Association, 21, 266, 328, 347  
 — Association of Science and Art, 220  
 — Cockburn Association, 50  
 — Guildry, 252  
 — Montrose Memorial, 197  
 — Public Library, 68, 182  
 — University, 91  
 — Art at, 253  
 — Museum, 219  
 Etching and Aquatint, 182  
 Exhibiting Architectural Drawings, 11, 85  
 Expenditure for Science and Art, 49  
 Fernherst Castle, 108  
 French Artists, Society of, 360  
 Forth Bridge, Construction of, 122  
 Fountains Abbey, 166  
 Fowler, C.E., the late John, 227  
 Frontage Line, 257, 343  
 Glasgow Archaeological Society, 294, 361  
 — Architectural Association, 91, 177, 213, 239  
 — Building in, 289  
 — Regulations, 252  
 — Cathedral, 113  
 — Exhibition Buildings, Cost of, 212  
 — House Property in, 347  
 — Institute of Architects, 21  
 — Measurers, 199  
 — Old Metal Workers, 166  
 Glass, Working in, 217  
 Gloucester, Archaeology in, 51  
 — Baths, 4, 66  
 — Cathedral Reredos, 353  
 Greek Excavations, 354  
 — Statuettes, 353  
 Heavy Buildings, 296  
 Holl, the late Frank, 65  
 Holyrood Abbey, 185  
 Imperial Institute, 5  
 Indian Architecture, 130  
 Institute By-Laws, 366  
 Insurance of Works of Art, 160  
 Kimberley, Masonic Temple, 313  
 Kirkstall Abbey, 226, 241, 354, 360  
 Lake Deposits, South Devon, 49  
 Leeds Architectural Society, 279, 342  
 — Sanitary Work in, 213  
 Leicester Society of Architects, 289  
 Lichfield Cathedral, 9  
 Light and Air Case, Ireland, 54  
 Lightning Conductors, 169  
 Line Engraving on Metal, 190  
 Liverpool Architectural Society, 239  
 — Art Congress, 63  
 — Theatres, 12  
 — Town Halls, 308  
 London School Board, 62, 311  
 — Street Architecture, 167  
 M'Lean, the late John, 105  
 M'Leod, the late John, 88  
 Maldon, 171  
 Manchester Architectural Association, 239, 353  
 — Fine Arts Academy, 213  
 — Owens College, 198  
 — Ship Canal, 277  
 — Society of Architects, 59  
 Masons' Marks, 86  
 Mistakes in Architecture, 195, 204  
 Monument, The, 210  
 Muir, the late Thomas S., 225  
 Municipal and Sanitary Engineers, 29  
 Museum Education, 168  
 Museums, Foreign, 23  
 — German Commercial, 39

## Articles—continued.

National Gallery, 17, 77  
 — Dublin, 85  
 — Portrait Gallery, 77  
 Newcastle Society of Antiquaries, 114  
 Old Glasgow, 107  
 Oldbury Public Buildings, 77  
 Ovoca Church, Ireland, 354  
 Oxford, Building in, 223  
 Paris Labour Exchange, 360  
 Patronage of Art, 212  
 Permanency of Water-Colours, 77, 92, 99, 133, 150  
 Peterborough Cathedral, 73  
 Pictures for the National Gallery, 77  
 Portrait-Painting, Professor Herkomer on, 210  
 Position of Art in England, 318  
 Professional Menu, 361  
 Public Sanitary Inspectors, 68  
 Redgrave, the late Richard, 361  
 Registration of Architects, 241  
 Restoration, Lord Grimthorpe on, 143  
 — or Destruction? 149, 161  
 Rhind Lectures in Archaeology, 231, 246, 267  
 Roads, "Made-up," 247  
 Roman Baths, 146  
 — Silchester, 198  
 Rome, Building in, 61  
 Royal Academy Schools, 23, 343  
 — Archaeological Institute, 51, 75  
 — Scottish Academy, 240  
 Sanitation of Towns, 120  
 School Building in Leeds, 23  
 Scottish Archaeology, Marquis of Bute on, 129  
 — Brochs, 121, 138  
 — Royal Academy, 341  
 — Water-Colour Society, 232  
 Sellers, the late James, 203  
 Sheffield Society of Architects, 287, 239, 347  
 Society of Arts, 5  
 — Engineers, 336  
 Somerset Archaeological Society, 134  
 South Kensington Estate, 101  
 South Wales Art Society, 102  
 Stained-glass and Woodwork, 43  
 Standards of Light, 365  
 Stockport School of Art, 211  
 Stone Masonry, Strength of, 38  
 Strata Florida Abbey, 107, 124  
 Stratford-on-Avon, St. Mary's, 120  
 Surrey, Archaeology of, 38  
 Surveyors' Institution, 178  
 Technical Education, 218, 353  
 Titian and Reynolds, 192  
 Trondheim Cathedral, 114  
 University College Architectural Classes, 33  
 Venice, Restoration of the Doges' Palace, 234  
 Ventilation of York Guildhall, 134  
 Vienna, Burg Theatre, Electric Light, 277  
 Wallace Sword, Archaeology of, 295  
 Walter, Thomas Ustick, 232  
 Warwick, St. Mary's Church, 106  
 Washington Monument, 298  
 Water-Colours, Permanency of, 77, 92, 99, 133, 150  
 Wells and the Cathedral, 131, 153  
 Westminster Abbey, 73  
 Wolverhampton School of Art, 65  
 Wybunbury Church, 74  
 York Architectural Association, 197  
 — Church of St. Michael-le-Belfry, 10  
 Yorkshire Archaeology, 53  
 — Union of Artists, 307

## By-gones:—

Addison on Architecture, 80  
 Goethe's Criticism on the Head of one of the Horses of Night in the British Museum, 369  
 How Lord Elgin acquired the Parthenon Sculpture, 253, 269  
 Restraints on the Growth of London, 100  
 Sacre's History of Blenheim, 36

## Church Building and Restoration:—

14, 56, 82, 96, 126, 156, 172, 186, 200, 214, 227, 241, 284, 298, 313, 343, 356

## Contract Reporter:—

American Blast Furnace Practice, Nov. 30  
 — Chimney, Nov. 2  
 — Labour, Dec. 7  
 — Notes, Oct. 26, Nov. 2, 23  
 Antique Clocks, Oct. 12  
 Ayr, Progress of, Oct. 12  
 Banks of the Danube, Sept. 7  
 Bath Guildhall, Sept. 7  
 Birmingham and Liverpool Ship Canal, Sept. 7  
 Book Camera, Nov. 9  
 Brewery Engineering, Aug. 10  
 Brickmaking in Bedfordshire, Aug. 3  
 Brighton as a Health Resort, Aug. 31  
 British at International Exhibitions, Nov. 9  
 Building in Glasgow, Oct. 5  
 — Greenock, Nov. 9  
 — Leeds, Nov. 16  
 — Materials in America, Dec. 23  
 California, Building in Los Angeles, Aug. 3  
 Canal Lift, July 20  
 City Markets, Dec. 7  
 — of London Court, Dec. 7  
 Concrete in Aberdeen Graving Dock, July 13  
 Constant Water Supply, Sept. 28  
 Coventry, St. Michael's Church Tower, Oct. 26  
 Cyprus, Public Works in, Oct. 19  
 Docks and Canals, Sept. 14  
 Dublin Railway Bridges, July 27  
 — Science and Art Museum, Oct. 12  
 Dundee Theatre Royal, Oct. 12  
 Edinburgh Water-Supply, Nov. 9  
 Electric Lighting in London, Dec. 28  
 — Central Station, Nov. 2  
 — Mountain Railway, Aug. 31  
 — Travelling Crane, Dec. 14  
 Electricity by Artesian Well-Driving, Dec. 21  
 — for Tramcars, Sept. 28  
 Engineer of the Future, Oct. 19, 26  
 English Trade with Norway, Dec. 14  
 Fall of a House in Dublin, Oct. 19  
 — London, Nov. 16  
 Forth Bridge, Dec. 28  
 Foundry Work, Nov. 9  
 Glasgow, Artisans' Dwellings, Sept. 21  
 — Central Railway, Aug. 3  
 — Institute of Architects, Dec. 7  
 — Saltmarket Dwellings, Oct. 26  
 Gordon Statue, Dec. 7  
 Government Building Contracts, Dec. 7  
 House Draining, Nov. 2  
 Instruction in Drawing, Aug. 3  
 Irish Architecture, Dec. 7  
 Iron Fireproof Curtain, Sept. 7  
 Japan, Water Supply in, Sept. 28



**Contract Reporter—continued.**

Lambeth Reredos, Oct. 5  
 Light Road Railways, Sept. 14  
 Liverpool Docks Improvement, July 6  
 — Theatres, Nov. 2, Dec. 21  
 Longton, New Theatre, Aug. 31  
 Mackay, John (with Portrait), July 6  
 Manchester Drainage, Sept. 14, 21  
 — Progress of, Oct. 5  
 — Ship Canal, July 20, Aug. 3,  
 Sept. 21, 28, Oct. 26  
 — Street Architecture, Nov. 16  
 Manufacture of Steel, Aug. 24  
 Melbourne Exhibition, July 20  
 Memel Timber, Oct. 26  
 Metropolitan Board of Works, Nov. 16  
 — Sewage Works, July 27  
 Mining Industry in Britain, Oct. 12  
 Monopoly of Practice, Oct. 26  
 Mortars and Concretes, Nov. 30  
 Movable Wooden Churches, Aug. 24  
 National Master Builders, Aug. 3  
 Natural Gas in Ohio, Aug. 24  
 New York Plumbing Regulations,  
 Aug. 17, 24  
 Nine Elms Carriage Works, Oct. 5  
 Peruvian Railways, Dec. 28  
 Practical Education, Oct. 5  
 Preston Parish Church, Nov. 2  
 Purification of the Clyde, Dec. 7  
 — Thames, Aug. 10, 24;  
 Sept. 21  
 Railway Construction in Japan, Nov. 16  
 Refuse Destructors, Oct. 5  
 Reminiscences of a Contractor, Aug. 3  
 Removing Granite Dust, Dec. 28  
 Ring Growth in Timber, Oct. 26  
 Rome, Embankment of the Tiber, Sept.  
 14  
 Rusting of Iron, Sept. 7  
 Sanitary Registration of Buildings, Aug.  
 10  
 — Social Problems, Dec. 14  
 Sanitation of Towns, Aug. 17  
 Sheffield Ship Canal, Oct. 12, Dec. 7  
 Ship Canals, Aug. 24  
 Statistics of Vision and Colour Sight,  
 Sept. 14  
 Steam-Engine Efficiency, Dec. 7  
 Steel Buildings, Sept. 7  
 — in Foundations, July 27  
 Stone-Cutting by Wire Rope, Dec. 28  
 Sunlight and Tree Growth, Nov. 9  
 Supporting Power of Soils, July 6  
 Suspension Bridge, New York, Aug. 31  
 Teaching for Industrial Designing,  
 Oct. 12  
 Technical Education, Dec. 21  
 Theatre Exits and Fire Risks, Aug. 10,  
 Oct. 12  
 Utilisation of Electricity, Sept. 14, 21  
 — Water Sources, Sept. 14  
 Vienna Theatres, October 12, 19  
 Visit to Millwall Docks, Dec. 14  
 Water Power in the United States,  
 July 20  
 — Supply of Old London, Sept. 14  
 Waterproofing Masonry, Aug. 10  
 West of Scotland Sanitary Association,  
 Dec. 7  
 York, Theatre Royal, Aug. 31

**Correspondence:—**

Antiquities of the Isle of Wight, 56  
 Architectural Hint from India, 139  
 Art Congress at Liverpool, 343  
 Cash on Delivery, 355  
 City of London College, 69  
 College of Architecture, 12, 40, 55, 68,  
 81, 95, 110  
 Contrast or Harmony? 81, 95  
 Competitions, 69, 214  
 Italian Vandalism, 96  
 Longton Cottage Hospital Competition,  
 355  
 Oriental Architecture in England, 154  
 Portland Stone in London, 227  
 Pottery, Mr. Gladstone on, 125  
 Registration of Plumbers, 125  
 Revival of Architecture, 39, 56  
 School Board Inquiry, 125  
 Theatre Exits and Fire Risks, 95, 110,  
 124, 139, 155, 171

**General:—**

14, 24, 40, 56, 70, 82, 96, 110, 126, 140,  
 156, 172, 186, 200, 214, 228, 242, 256  
 270, 284, 298, 314, 328, 344, 356, 370

**Leading Articles:—**

Address on Architecture by Mr. Royle,  
 72  
 Antwerp Triennial Exhibition, 142, 158  
 Architects of Western America, 358  
 Art and History, 2  
 Arts and Crafts Exhibition, 258, 272  
 Back-to-Back Houses, 42  
 British Museum, 112  
 Brussels Exhibition of Monumental Art,  
 188  
 — Retrospective  
 Art, 202  
 Cotman, John Sell, 286  
 Goncourts, Journal of, 316  
 Gwilt's Encyclopedia, 128  
 Italian Exhibition, 16  
 Jerusalem, Holy Places of, 216  
 Kirby Hall and Weldon Stone, 230  
 London School Board, Works Depart-  
 ment, 300  
 Museums and Art Galleries, 174  
 Provence and the Riviera, 330, 346  
 Psychological Basis of Fine Art, 98  
 Siemens, Sir William, 244  
 Sketches of Architecture, 28  
 Water Colours, Fading of, 84  
 Water Engineering, 58

**Legal:—**

Accuracy of Quantities, 69  
 Arbitration Case,\* Aug. 24  
 Blasting Operations, 364  
 Building By-laws,\* July 27  
 Circus Building, Edinburgh,\* Dec. 14  
 Claim for Extras, 357  
 — Professional Work,\* Aug. 24  
 Clay as a Mineral,\* Aug. 17  
 Compensation for Ancient Lights,\* Oct.  
 26  
 Covered Windows as Ancient Lights,  
 281  
 Damage to Property from Excavations,\*  
 July 13  
 Damp Courses,\* Dec. 28  
 East London Waterworks Company,\*  
 Sept. 28  
 Employers' Liability,\* Aug. 10, Oct. 5  
 — Scotland, 345  
 Fees for the Liverpool Waterworks  
 Plans, 111  
 Foreshore Rights,\* Aug. 24  
 Law of Arbitration in Ireland, 15  
 Liability for Subsidence of Land,\*  
 Aug. 3  
 Light and Air Case, Ireland, 54  
 Limitation of Height in Building,\* Dec.  
 21  
 Line of Frontage, 267  
 Made-up Roads, 247, 343  
 Measuring Timber,\* Sept. 28  
 Obstruction of Light,\* Aug. 17  
 Payment for Plans, 285  
 — of Quantities, 271  
 — Sub-contractors,\* Aug. 17  
 Pointing in Frosty Weather,\* Oct. 26  
 Portland Cement Trade Marks,\* July 6  
 Powers of Local Boards, 350  
 Responsibility for State of House  
 Drains,\* July 27  
 — of Valuers, 1  
 Sale of House Property, 236  
 Smoke Act and Lambeth Potteries,\*  
 Sept. 7  
 Uninflammable Roof Material, 243  
 Wooden Buildings at Olympia,\* Sept. 7  
 \* Contract Reporter.

**New Buildings:—**

14, 126, 172, 214, 242, 284, 314, 355

**Notes and Comments:—**

Altenburg Amphitheatre, 90  
 Ancient Inscription in a Welsh Chapel,  
 32  
 "Apollo" of Praxiteles, 265  
 Arbitrary Local Boards, 350  
 Archaeological Competition, 292  
 Architects and Sculptors, 118  
 Architectural Association, 180  
 Art Commissioners in America, 278  
 Artists' Busts at the Luxembourg, 265  
 Beavis, Mr. Richard, 323  
 Bill Sticking in Paris, 364  
 Birmingham Architectural Association,  
 278  
 British Machinery Exhibit, 364  
 — School at Athens, 32  
 Brussels Exhibition, 292  
 — New Post-Office, 48  
 — Royal Museum, 236  
 Burial Grounds of the Incas, 90  
 Carlyle on Wren, 250  
 Chapu and Vasselot, M.M., 292  
 Chersonese Exploration, 292  
 Church of St. Martin, Rome, 337  
 City Arms of Bath, 48  
 Clerk of Works in America, 278  
 Collapse of Buildings, 306, 315  
 Contest of London Sketching Clubs, 250  
 Cotman's Drawings, 292  
 Decoration of a Steamship, 337  
 Disregard of Shoring in Paris, 8  
 Dramatic Novelty in Paris, 306  
 Edinburgh Castle, 306  
 Electric Light Unhealthy, 250  
 Emden Prize, 250  
 English Traders in Japan, 236  
 Engraved Gems in the British Museum,  
 90  
 Etching of the Tower of London, 235  
 Excavations at Thespeia, 323  
 Fire at Messrs. Doulton's Works, 337  
 French Historic Monuments, 93  
 — Picture Galleries, 278  
 Making Art-History, 250  
 Manchester Architectural Association,  
 323  
 Memel Timber Trade, 236  
 Memorial to Claude Lorraine, 350  
 Millet's Atelier in the Barbizon Farm-  
 house, 90  
 Municipal Buildings Scheme at Tam-  
 worth, 32  
 — Offices for New York, 48  
 Museums and Lecturers, 180  
 — in France, 278  
 London School Board Buildings, 8, 236  
 Luminous Fountains, 265  
 Kirkstall Abbey, 141, 157, 180, 329  
 Hansom, the late C. F., 323  
 Hawksley, Mr. T., and Mr. Burstal, 48  
 Historic Manuscripts of Belgium, 350  
 Galliera, the late Duchess of, 337  
 Gambier Parry Memorial, 278  
 Government Architect in Melbourne, 90  
 — House at Simla, 90  
 Growth of Annular Rings in Timber,  
 32  
 Norwich Castle as a Museum, 365  
 Official Draughtsmen, 306  
 Paley, the late Professor, 337  
 Paris Exhibition, 306  
 — Diploma, 337  
 — House Supply, 265  
 Porte de Hal Museum, Brussels, 118  
 Portraits in Egyptian Tombs, 250  
 Restoration of a Paris Fountain, 236  
 Rock Blasting, 364  
 Royal Irish Academy, 278  
 Russian Paving Stone, 180  
 Sale of House Property Case, 236  
 Sanitary Recommendations, 90  
 School Board Building Administration,  
 292  
 — Finances, 250  
 Shakespeare, 118  
 Society of Art Masters, 48  
 Statues at the Sorbonne, 265  
 Stothard's Drawings, 306  
 Subsidence in the Salt District, 364  
 Tuileries, 118  
 Useful Book of Reference, 364  
 Vienna and the Paris Exhibition, 323  
 Wedgwood Ware, 180  
 Yorkshire Lake Dwellings, 364

**Reviews:—**

Architectural Association Sketch-Book,  
 26  
 Architecture of Provence and the  
 Riviera, David Macgibbon, 330, 346

**Reviews—continued.**

Encyclopedia of Architecture, Joseph  
 Gwilt. New Edition, Wyatt Papworth,  
 128  
 Histoire des Anciens Peuples de l'Orient,  
 Louis Ménéard, 2  
 — Grecs, Louis Ménéard, 2  
 — Israélites d'après l'Exégèse  
 Biblique, Louis Ménéard, 2  
 Holy Places of Jerusalem, T. Hayter  
 Lewis, F.S.A., 216  
 Life of Sir William Siemens, F.R.S., &c.,  
 William Pole, F.R.S., 244  
 Museums and Art Galleries, Thomas  
 Greenwood, F.R.G.S., 174  
 Notes on the Psychological Basis of  
 Fine Art, F. S. Granger, A.R.I.B.A.,  
 98  
 Water Engineering, Practical Treatise  
 on the Measurement, Storage, Convey-  
 ance, and Utilisation of Water, Charles  
 Slagg, C.E., 58

**School Buildings:—**

82, 156, 186, 200, 214, 255, 355

**Tesserae:—**

Aiken, E., Vitruvian Canons, 45  
 Ashpitel, A., Chancels in Italy, 102  
 Barlow, W. H., Theory of the Arch, 46  
 Barnes, W., Contrast of Colours in  
 Nature, 304  
 Barry, E. M., Lighting of Temples, 362  
 — Pompeian Houses, 208  
 Beazley, S., Etymology of "Fret," 88  
 Bell, John, Chryselephantine Statues, 76  
 Blackie, J. S., Idea in Art, 7  
 Boutmy, Emile, Influence of Vitruvius,  
 290  
 Brandon, R., Mediaeval Tie-Beams, 179  
 Braun, Emil, Equestrian Statue of  
 Marcus Aurelius, 29  
 — Tarquinian Mural Paint-  
 ings, 148  
 Bridges, J. H., Defective Planning in  
 London, 46  
 Burges, W., Italian Gothic, 249  
 — Oldest Architectural Draw-  
 ing, 75  
 — Saxon Architecture, 193  
 Burgess, R., Portico of Octavia, Rome,  
 104  
 — Theatre of Pompey, Rome,  
 290  
 Bunnell, G. R., Data for Strength of  
 Stone, 208  
 — Effect of Frost on Stone,  
 233  
 — Why Mortar Hardens,  
 89  
 Butler, G., Raphael and Da Vinci, 6  
 Church, A. H., Coloured Materials in  
 Architecture, 233  
 Clark, E., Flexure of Wrought-iron  
 Plates, 179  
 Crace, J. G., English Eighteenth-century  
 Wall-papers, 64  
 Cresy, E., Velarium of the Coliseum, 63  
 Cockerell, C. R., Léon Baptiste Alberti,  
 179  
 — Points of View and  
 Visual Angles, 88  
 — Vitruvius, 117  
 Colburn, Z., Elasticity of Wrought-iron,  
 117  
 Colling, J. K., Foliage in Decoration,  
 163  
 Conybeare, H., Technical Note Books,  
 117  
 Cousin, Victor, Metaphysics of Art, 221  
 Cumming, J., Sandstone as a Building  
 Material, 63  
 Curtius, E., Treasures of Olympia, 89  
 Dallaway, J., Towers and Spires, 349  
 Daly, C., Ancient Use of Bronze, 64  
 Davidson, T., Frieze of the Par-  
 thenon, 6  
 Davies, T., Cast-iron Beams, 31  
 Davis, J. P., Royal Academy, 222  
 Didron, A. H., Cruciform Churches, 248  
 Donaldson, T. L., Architecture early in  
 the Century, 75  
 — Greatness of Classic  
 Architecture, 47  
 Dyce, W., Religion and Art, 5  
 Eakins, T., First Steps in Painting, 349  
 East, F., Author of Vitruvius Britan-  
 nicus," 222



January 11, 1889.]

## Tesserae—continued.

Castlake, Sir C. L., Generalising in Art, 348  
 Gibbs, J., as an Architect, 304  
 Lillie, M., Effect of Time on Slaked Lime, 47  
 Ferguson, J., Conditions of Progress, 148  
 Imitative and Conventional Ornament, 31  
 Relation of Artist to Art, 305  
 Ledler, K. G., Temple of Apollo at Delphi, 80  
 Lisher, S., Encaustic Painting, 362  
 Locke, F., Pont de l'Alma, Paris, 89  
 Roman, E. A., Roman Architecture, 116  
 St. Stephen's Abbey, Caen, 222  
 Dalton, D., Admission of Air to Rooms, 348  
 Hindie, C., French Realistic Painting, 104  
 Cranville, W. L., Columns of the Parthenon, 164  
 Griffith, W. P., Medieval Treatment of Capitals, 20  
 Gruyer, M., The Quattrocentisti, 304  
 Swill, J., Italian Influence on French Architecture, 7  
 Tate, J. C., Thorwaldsen's *Mercury*, 208  
 Jaydon, B. R., Vasari's Biographies, 234  
 Jegel, G. W. F., Object and Aim of Art, 349  
 Kistoff, J. J., Greek Wall-painting, 19  
 Luggins, S., Gothic Buttresses, 362  
 Hughes, J., Park, Road and Garden Walks, 249  
 Furlstone, F. Y., Alhambra and Mosque of Cordova, 104  
 Anson, E., Architecture under Francis I., 30  
 Jackson, W., Amateur Artists, 207  
 Knight, R. P., Imitation in Architecture, 19  
 Word "Picturesque," 115  
 Leeds, W. H., Elizabethan Architecture, 363  
 Use of Caryatids, 221  
 Lewis, G. H., Nero and the Burning of Rome, 348  
 Linton, W., White Ground in Painting, 103  
 Lubbock, M., Colour Sense of the Ancients, 116  
 Lyell, Sir C., Formation of Granite, 249  
 Merivale, C., Destruction of Roman Temples, 303  
 Moody, F. W., Raphael's Cartoons, 147  
 Nash, E., Crushing of Masonry, 76  
 Neville, J., Flow of Water through Pipes, 104  
 Northcote, J., Vandyke's Painting, 45  
 Palgrave, Sir F., Cathedral of Treves, 305  
 Parry, T. Gambier, Fifteenth-century Glass, 248  
 Pater, W. H., Da Vinci's *Mona Lisa*, 6  
 Penrose, F. C., Pavement of the Parthenon, 164  
 Petrie, G., Windows in Ancient Irish Churches, 194  
 Poynter, A., Arabesque Decoration, 163  
 Subjects for Decoration, 207  
 Proudhon, J. P., Classicists and Roman-ists, 116  
 Pugin, A. W., Gothic Pinnacles, 362

## Tesserae—continued.

Ramsay, W., Atrium in Roman Houses, 147  
 Roman Cavaedium and Peristylum, 303  
 Rankine, W. J. M., Architecture and Engineering, 20  
 Theory of Structures, 46  
 Ranking, B. M., Renaissance Influence, 220  
 Redgrave, R., Accuracy in Painting, 193  
 National Style, 103  
 Taste, 207  
 Reid, W., Sea Water and Iron, 290  
 Rennie, Sir J., Water-Supply of London, 221  
 Robison, J., Oblique Mortise and Tenon, 31  
 Ruskin, J., Tone in Painting, 47  
 Turnerian Periods, 362  
 Works of Art in Schools, 63  
 Scott, David, Art and Society, 291  
 Sir G. G., Architectural Drawing, 30  
 Building Accounts of Westminster Abbey, 178  
 Classic and Gothic Columns, 363  
 French and English Windows, 88  
 Sharpe, E., Mouldings of the Seven Periods, 235  
 Windows of Altenberg Abbey, 305  
 Shaw, E. M., Endurance of Storey Posts, 348  
 Smirke, S., Finger-Rings in Antiquity, 178  
 Greek Orders, 30  
 Truth in Architecture, 248  
 Smith, R. H. S., Classification of Arts, 234  
 Street, G. E., Architectural Drawing, 162  
 Thirteenth-century Glass, 291  
 Ypres, 147  
 Tarbotton, M. O., Subways in Towns, 363  
 Thomson, A., Marble in Ancient Rome, 115  
 Roman Road Construction, 19  
 Turner, J., Roman Bricks, 249  
 Vandoyer, M., Dampness in Foundations, 103  
 Viollet-le-Duc, Pantheon at Rome, 348  
 Vitet, L., Medieval Love of Colour, 291  
 Waring, J. B., Sarcophagi in Arles Museum, 75  
 Webb, L., Easements by Prescription, 194  
 Westmacott, R., Bronze of the Ancients, 304  
 Sculpture in the Chapel of Henry VII., 163  
 Sculpture of Wells Cathedral, 179  
 Wicksteed, T., Old London Bridge Waterworks, 234  
 Wilkinson, Sir G., Vertical Line in Roman Architecture, 235  
 Willis, R., German Stellar Vaulting, 7  
 Italian Gothic Doorways, 147  
 Wilson, A., Thinking in Stone, 7  
 C. H., Pietra Dura Mosaic, 221  
 Time taken in Fresco Painting, 194  
 G., Ancient Sanitation, 237  
 Winston, C., Stained Glass and Architecture, 233

## Tesserae—continued.

Wornum, R. N., School of the Caracci, 148  
 Wundt, T., Kosciuszko Monument, 20  
 Wyatt, Sir M. D., Architecture and Subsidiary Arts, 19  
 Style in Sculpture, 193

## The Week:—

Address of Mr. Alfred Waterhouse, R.A., 229  
 Affiliation of Students' Societies, 285  
 Alexander Thomson Memorial, 71, 215, 229  
 American Architectural Societies, 271  
 Ancient Altar Tomb, 83  
 Antwerp Exhibition, 57, 71  
 Architectural Association, 229  
 Relics of Scotland, 127  
 Art Conferences in Paris, 329  
 in Scotland, 127  
 Purchase for Liverpool, 329  
 Section at the Paris Exhibition, 173, 187  
 Ashmolean Museum, Oxford, 299  
 Australian Architect's Salary, 357  
 Bath City Arms, 83  
 Benches of Ormskirk Parish Church, 173  
 Birmingham Architectural Association, 257  
 School of Art, 127  
 Society of Artists, 111  
 Black and White Exhibition, Paris, 97  
 Boulanger, the late Gustave, 173  
 Bramwell, Sir Frederick, on Engineering, 127  
 British Archaeological Association, 15  
 Association, 141  
 Church of the Covenant, Washington, 173, 187  
 Sablon, Brussels, 201  
 City Underground Communications, 141  
 Clay as a Mineral, 83  
 Collapse of Buildings, 306, 315  
 College for Music, Proposed, 41  
 Conference on Copyright, 83  
 Construction of London Board Schools, 201  
 Continental Streets, 285  
 Contracts of the London School Board, 315  
 Cossey Church Restoration, 157  
 Cromer Church, 173  
 Devizes Castle, 97  
 Diploma Designs, Paris Exhibition, 285  
 Dublin International Exhibition, 111  
 Dundee Institute of Architecture, 1  
 Easton, C.E., the late James, 243  
 Eiffel Tower, 173  
 Electric Lighting, 257  
 Employers' Liability in Scotland, 345  
 Etex, Antoine, Sculptor, 25  
 Exhibition of Architectural Photographs, 257  
 Pastels, 127  
 Fall of London Houses, 271  
 Farscope, 15  
 Fireproof Roofs, 243  
 François, Alphonse, Engraver, 15  
 Geometry of Stone-cutting, 127  
 Glasgow and Architects' Services, 271  
 Exhibition Buildings, 243, 329  
 Griffith, the late John, 243  
 Hackney Board of Works, 157  
 Hawkesley, Mr., and the Liverpool Corporation, 111  
 Herkomer, the late Lorenz, 57  
 History of Painting, 111

## The Week—continued.

Holl, the late Frank, 57, 71  
 House-Building in Liverpool, 15  
 Indian Art, 345  
 Institute of Architects, 257  
 and London Improvements, 315  
 of Ireland, 357  
 Ireland, Law in Arbitration, 15  
 Irish Spiral Bracelets, 41  
 Kirkstall Abbey, 141, 157, 180, 329  
 Leeds Architectural Society, 243  
 School Board and Architects, 25  
 Lidstone Collection of Casts, &c., 97  
 Liverpool Jubilee Memorial, 1  
 Local Government Act, 57  
 London Public Buildings, 267  
 School Board, 215  
 Luxembourg Museum, 111  
 Metropolitan Board of Works, 257  
 Milan Cathedral Designs, 215  
 Model Village at Aintree, 1  
 Mont St.-Michel, 329, 350  
 Munich Exhibition and Painters, 97  
 Municipal and Sanitary Engineers, 1  
 Museum at Mont St.-Michel, 71  
 Education, 157  
 Mythical Architects, 187  
 National Art Congress, 315  
 Nesfield, the late W. E., 41  
 Nonpayment for Plans, 285  
 Norwich Art School, 329  
 Old Carved Woodwork, 299  
 Old Masters at Birmingham, 111  
 Olympian Remains, 229  
 Opera Comique Competition, 299  
 Ostend Water Supply, 187  
 Palestine Exploration, 25  
 Panorama Painting, 357  
 Paris, Opéra Comique, 285  
 Parkes Museum Lectures, 141  
 Parry, the late T. Gambier, 187  
 Payment for Extras, 357  
 Quantities, 271  
 Prizes for Art Workmen, 71  
 Redgrave, Richard, the late, 345  
 Re-erection of Temple Bar, 329  
 Reform of Law on Lights, 25  
 Regulation of Height in Building, 1  
*Revue Universelle Illustrée*, 57, 187  
 Royal Bounty to Sculptors, 57  
 Society of British Architects, 299  
 Rugby, 111  
 Safety of Paris Theatres, 127  
 Scottish Arboricultural Society, 71  
 Royal Academy, 243  
 Sellars, the late James, 201  
 Shaftesbury Theatre, 229  
 Society of Architects, 25, 271  
 Arts Programme, 271  
 South Kensington Handbooks, 285  
 Wales Art Society, 299  
 Spalding Club, Aberdeen, 243  
 St. Peter's Church, Westminster, 285  
 St. Petersburg Exhibition, 71  
 Statue of the Duke of Wellington, 357  
 Statues of Wallace and Bruce, 157, 215  
 Stirling Castle, 157  
 Stone or Brickwork for Edinburgh? 41  
 Technical Education at Liège, 187  
 Temple of Apollo, Delphi, 229  
 Trade of Hamburg, 229  
 Tuileries, 83  
 Utilisation of French Canals, 329  
 Vacant Land at the Law Courts, 57  
 Valuation of Property, 1  
 Water-Colours, Action of Light on, 71  
 Waterford Guardians and Architects, 357  
 Wedgwood not an Artist, 97  
 West London School of Art, 345  
 Wolverhampton Art School, 41, 173  
 Work and Relaxation, 97



## INDEX OF ILLUSTRATIONS.

\* \* THE LITHOGRAPHED ILLUSTRATIONS WILL BE FOUND OPPOSITE TO THE PAGES QUOTED.

Alnwick, Proposed Corn Exchange, 251  
 Askham Hall, near York, 33  
 ——— Stable Buildings, 223  
 Battersea, Baptist Chapel, Northcote Road, 365  
 Bedford, Fire Station, 209  
 ——— Provident Dispensary, 209  
 Belfast, Villa Residence, 91  
 Blackburn Union Offices, 91  
 Boraston Chapel, Salop, 322  
 British Museum, Sketches from, 307  
 Bromley Park, Kent, Houses, 293  
 ——— Kent, Residences, Sundridge Park Avenue, 65  
 Charles V., Last Moments of the Emperor, 33  
 Chelsea, Mansions, Pont Street and Sloane Street, 165  
 Chester Cathedral, 21

Draining Mill, Lincolnshire, 307  
 Epworth, John Wesley Memorial Chapel, 135  
 Fallowfield, Manchester, Residence, 91  
 Fountain, Design for, 105  
 Halifax, Yorkshire, Penny Bank, 351  
 Haughton, Manchester, Schools, 266  
 Hebburn-on-Tyne, Church of St. John, 119  
 ——— Fêche, 209  
 Headingley, House and Shops, 91  
 ——— Shop and Smithy, 49  
 Heaton, Residence at, 149  
 Heidelberg Castle, Friedrichs Bau, 77  
 ——— Otto Henrichs Bau, 77  
 Horbury Junction, Wesleyan Chapel, 365  
 Judicial Reconciliation, 9  
 Kirby Hall, 209  
 Knottingley, Fireplace, Swan Inn, 251

Last Prayer for the Condemned, 65  
 Leeds Fine Art Gallery, 279  
 ——— Mission Church, Roundhay Road, 251  
 ——— Parish Church Mission Room, 266  
 ——— Residence, Woodburne, Roundhay Park, 77  
 Luton, District Church of St. Paul, 209  
 Methly, Leeds, Semi-detached House, 49  
 Newcastle-on-Tyne, Extension of Grey and Grainger Streets, 336  
 Normandy, Château, 365  
 Northampton, Business Premises, 181  
 On the Greta, Yorkshire, 322  
 Oulton Hall, near Leeds, 195  
 Pinner, The Hut, 279  
 Premises, Nos. 192-194 Oxford Street, 49  
 Reading, Harrison Memorial, 135  
 ——— Jubilee Memorial Fountain, 105

Registration of Birth, 237  
 Reverie of Pope Paul III., 21  
 Sayers Common, Sussex, Country Vicarage, 91  
 Southwell Cathedral, Capital in Chapter House, 21  
 Stonyhurst College, the Chapel, 119  
 Storm at Sea, Moonlight, 293  
 Suburban House, 91  
 Tottenham, Church of St. Francis de Sales, 293  
 Twickenham, 336  
 Weston-super-Mare, Villa Residences, 195  
 Weybridge, Residence, Fir Grove, 119  
 Wharfedale, Residence, Pool Bank, 77  
 Wroughton, Somerset, All Saints Church, 135  
 Wyresdale, Lancashire, Abbeystead, 195  
 Yatton Church, Somerset, 135

## ARCHITECTURAL ILLUSTRATION SOCIETY.

Assisi Cathedral, Doorway, 165  
 Bayeux Cathedral, Nave, 21  
 Cairo, Mosque of Ibn Tuloun, 181  
 ——— Tomb of Sultan Berkook, 105  
 ——— Silk Mercers' Bazaar, 181  
 ——— Street in, Mosques of Kalaloon, El Nasr, and Berkook, 181  
 Capitals, 165  
 Chatham, Memorial to Lieut. Waghorn, 33  
 Chimney-piece, Dawpool, Cheshire, 65  
 Church of St. Agnes, Kennington Park, 279  
 ——— the Aliscamps, Arles, 195

Cleeve Abbey, Somersetshire, Refectory, 149  
 Cottage, 77  
 Della Robbia Ware, San Bernardino, Perugia, 91  
 Drawing-room, Lancaster Gate, 119  
 Equestrian Statue, Marcus Aurelius, 33  
 Fox Oak, Residence, 9  
 Gard, St. Gilles, 293  
 Gordon Memorial, Trafalgar Square, 322  
 Hampton Court, 9  
 House at Elstree, 77  
 ——— Palace Court, Kensington, 251  
 Italian Ironwork, 135  
 Kent, Cottages, Flushinghurst, 307

Kent, Cottages, Courtstile, 307  
 Leytonstone, Church of St. John the Baptist, 135  
 Mackonochie Memorial Chapel, St. Albans, Holborn, 365  
 Mantelpieces, Buckminster Park, Grant-ham, 119  
 Nîmes Cathedral, 336  
 ——— Old Roman Bath, 195  
 ——— Sketches from, 237, 266  
 Perugia, Arch Augusta, 293  
 Printing Offices, Fetter Lane, 237  
 Siena, Door to Baptistry, 149  
 Sketches, Camden House, &c., 49  
 St. George's Church, Bloomsbury, 165

St. John the Evangelist, Red Lion Square, View from Chapel, 209  
 ——— View of Chancel, 209  
 St. Paul's Cathedral, from North Aisle, 223  
 ——— from South Aisle, 223  
 Temple of Aboussimbel, 351  
 ——— Edfon, 351  
 ——— Great Court, 351  
 Venice Bell Towers, 49  
 Warehouse in Broad Street, Bloomsbury, 237

## ARCHITECTS AND ARTISTS.

Barratt, Reginald, 165  
 Belcher, John, 33, 135  
 Bell, Charles, 65, 135  
 Blanchon, M., 237  
 Bulmer, C. Bertram, 251  
 Chorley & Connon, 33, 195, 223, 266  
 Clayton & Black, 91  
 Cotman, John Sell, 293, 307, 322, 336, 365  
 Curzon, Henry, 119, 322  
 De Vriendt, Albrecht, 21, 33  
 Douglas & Fordham, 195  
 Downing, H. P. Burke, 105  
 Drury, Henry, 209  
 Dunn, Hansom & Dunn, 119  
 Gundry, Horace, 237  
 Hanstock, Walter, 385

Hardy, E. G., 9, 49, 135  
 Hayward, Charles Forster, 49  
 Hewitt, E. & F., 91  
 Horsley, Gerald, 21, 33, 149  
 Keen, Arthur, 135  
 Laslett, Thomas N., 209  
 Macartney, M. E., 307  
 Mallows, C. E., 149, 223, 251  
 Marten, W. H. & E. J., 149  
 May, E. J., 77  
 Measures, Harry B., 165  
 Mileham, C. H. M., 365  
 Miller, Henry, 336  
 Mountford, E. W., 365  
 Paul, Roland W., 49  
 Peacock, Joseph, 237

Pearson, John L., 209  
 Perkin & Bulmer, 351  
 Ransome, James, 279  
 Reavell, jun., George, 251  
 Ricardo, Halsey, 9, 119  
 Runtz, Ernest A., 307  
 Scott, George Gilbert, 279  
 Seaver, Henry, 91  
 Shaw, R. Norman, 65  
 Sinnott, J. & B., 293  
 Slater, J. A., 165, 293  
 Smith, Albert D., 181  
 Smith & Tweedale, 77  
 Spiers, R. Phené, 105, 181, 351  
 Stokes, Leonard, 251  
 Stones, Gradwell & Grimshaw, 91, 266

Thornycroft, Hamo, 322  
 Thorp, William H., 279  
 Usher & Anthony, 209  
 Van der Ouderaa, Pierre Jean, 9, 65  
 Verity, Frank T., 77  
 Voysey, C. F. A., 77  
 Webb, G. W., 105, 135  
 Wilde, Sydney John, 105  
 Wilkinson, H. Dimock, 91  
 Williams, Walter A., 293  
 Wilson, A. Needham, 195, 237, 266, 293  
 336  
 Wilson, M. Temple, 119, 209  
 Wilson, T. Butler, 49, 91, 251  
 Worthington, T. Locke, 21























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